

SPECIAL ARTICLES

A Review of Educational Assessment

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This primer reviews the rationale for the emergence of assessment in higher education; various definitions; distinctions between assessment and evaluation; and the levels of assessment. A framework that characterizes the various levels and types of assessments is presented. The published research literature in the *American Journal of Pharmaceutical Education (Journal)* regarding assessment activities in pharmacy education from 1990-2003 is reviewed and placed in context of a framework (program, curricular, or individual assessment). While there have been over 9,000 publications on assessment in higher education, only slightly more than 100 address pharmacy education, and approximately half of these were published in the *Journal*. The paper concludes with a discussion about an assessment plan, including an exploration of the need for and value of creating a culture of assessment within an organization.

Keywords: assessment, methodology, outcome

OVERVIEW OF ASSESSMENT

Assessment is a multi-faceted function requiring an understanding of student learning and a familiarity with the principles, purposes, practices, and uses of evaluation and measurement in higher education. On many campuses, individuals are involved in a variety of monitoring activities that include institutional and program effectiveness, curriculum reviews, and classroom or student outcomes assessment. This primer reviews the broader aspects of assessment and its status in pharmacy education as evidenced in the literature. This is followed by a discussion of the assessment process in general and a description of an educational assessment plan.

Why Did Assessment Emerge?

Assessment emerged as a national phenomenon in higher education in the mid-1980s. Ewell states, "Although no one has officially dated the birth of the assessment movement in higher education, it is probably safe to propose that date as the First National Conference on Assessment in Higher Education, held in Columbia, South Carolina, in the fall of 1985."¹

Finn states that political forces concerned about the weaknesses in higher education began to question whether the expenses to support educational endeavors were justified. Contributing to the move towards assess-

ment were several reports written about higher education during the 1980s.² The report *Involvement in Learning*, influenced by the student outcomes research of Alexander Astin, stated that higher education should institute systematic programs to assess students' knowledge, skills, and attitudes resulting from academic and co-curricular programs.³ The *Integrity in the College Curriculum* report was more direct, suggesting a need for improvement because of the lack of institutional accountability.⁴ These reports questioned the quality of education and challenged educators to think broadly about refining goals to bring about curricular and program improvement. Thus, assessment is now conducted, in part, to determine whether educational expectations are being met or to measure whether a program's graduates are attaining expected outcomes. When conducted properly, assessment can provide documentation about what and how students learn and provide ways for an organization to collect and utilize information for continuous improvement in the educational process.

An executive order issued by Secretary of Education William Bennett in fall 1988 required all federally approved accrediting organizations to include evidence of institutional outcomes in their criteria for accreditation.⁵ Each program must describe what its graduates are able to do (*outcomes*) and provide evidence that they have demonstrated these abilities (*assessment*). With this executive order, regional and professional accreditation agencies began revising standards and adding criteria to address student-learning outcomes specifically.

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Among professional accrediting agencies, the Accreditation Council on Pharmacy Education (ACPE) revised its accreditation standards to reflect these new requirements. The new standards were adopted June 14, 1997, and became effective July 1, 2000.⁶ According to the ACPE *Standards 2000*, as they are known, a college or school of pharmacy is expected to demonstrate that it systematically obtains outcomes information and applies it to cultivate program improvements and enhance student achievement (Appendix 1). As a result, the American Association of Colleges of Pharmacy (AACCP) accomplished the following: (1) provided leadership in the area of assessment by preparing the *Background Papers from the Commission to Implement Change in Pharmaceutical Education (1990-1992)*⁷; (2) created the Center for the Advancement of Pharmaceutical Education Advisory Committee, which prepared the Educational Outcomes and recently updated them^{8,9}; (3) conducted annual Institutes on Assessments from 1998-2003; (4) published various reports and handbooks¹⁰⁻¹⁵; and (5) provided numerous presentations at annual meetings. Thus, many colleges and schools of pharmacy have begun the practice of planning and incorporating assessment techniques in their organizations.

In summary, assessment has become widespread, whether motivated by accountability to external forces or by an institution's own desire to improve services and programs. Experts agree that effective assessment programs will offer systematic evidence about student learning and development. They assert that some form of assessment in higher education is here to stay and that the resulting information should be used in educational decision-making processes to improve learning and curricula. Angelo states, "After 15 years of widespread assessment movement, there is now broad agreement among accrediting agencies, disciplinary and professional associations, administrators, and faculty opinion leaders that improving student learning is (or should be) the primary goal of assessment."¹⁶

What Is Assessment?

The definition of assessment has also evolved with the emergence of the assessment movement. The following definitions of assessment are selected as representative of the variety of definitions found in the large body of literature on educational outcomes assessment.

Astin defines assessment as "the gathering of information concerning the functioning of students, staff, and institutions of higher education...The motive of gathering the information is to improve the functioning of the program and its people."¹⁷ This statement defines assess-

ment in a broad context, encompassing efforts toward improvement beyond that associated with student learning and development.

Loacker et al define assessment as "a multidimensional process of judging the individual in action."¹⁸ This became the basis for the assessment-as-learning framework that is used by Alverno College. Building on the origin of the term, which means to "sit down beside," Alverno developed an assessment process that uses careful judgment based on the kind of close observation that comes from "sitting down beside." The Alverno model and their definition focus on assuring that each individual is able to demonstrate specific learning outcomes that represent growth and development along a series of learning dimensions. Furthermore, the Alverno model builds multiple assessments and peer and self-assessments into all of the academic programs at their College.

Terenzini defines assessment as "the measurement of the educational impact of an institution on its students."¹⁹ This process highlights the potential influences that educational programs might have on students. The body of work contributed by Terenzini emphasizes the impact of institutional practices or educational interventions such as advising programs or curriculum innovation on the learning of groups of students rather than specific individuals.

Erwin defines assessment as "the systematic basis for making inferences about the learning and development of students. More specifically, assessment is the process of defining, selecting, designing, collecting, analyzing, interpreting, and using information to increase students' learning and development."²⁰ For Erwin, the assessment process includes a range of activities that increase the educators' ability to demonstrate gains in student-learning outcomes.

Palomba and Banta state, "Assessment is the systematic collection, review, and use of information about educational programs undertaken for the purpose of improving student learning and development."^{21(p4)} They further declare, "To make assessment work, educators must be purposeful about the information they collect, and after data collection, examine and use the assessment results to improve the program."^{21(p4)}

Huba and Freed state that "assessment is the *process* of gathering and discussing information from multiple and diverse sources in order to develop a deep understanding of what students *know*, understand, and can *do* with their knowledge as a result of their educational experiences. The process culminates when assessment results are used to improve subsequent learning."²² Their definition of assessment as a process underscores the purposeful aspect of the work and reminds practitioners

Table 1. Levels of Assessment

Institution	Individual Continued
Accreditation	Faculty (Self/Peer)
Program Review	➤ Teaching
Alumni Studies	➤ Scholarly Productivity
Program Development	➤ Service
Program Enhancements	➤ Development and Career Advancement
Student Retention and Progression	➤ Retention
Program	➤ Satisfaction
Curriculum	Staff
Courses	➤ Performance
Teaching-learning methods	➤ Development and Career Advancement
Recruitment	➤ Retention
Retention	➤ Satisfaction
Graduation	Administrators
Performance	➤ Performance
Individual	➤ Development and Career Advancement
Students	➤ Scholarship
➤ Learning	➤ Retention
➤ Values	➤ Satisfaction
➤ Attitudes	
➤ Behaviors	
➤ Skills	
➤ Progression and Retention	
➤ Satisfaction	

there should be an intended use of the information for the enterprise to have legitimacy.

These definitions suggest several important characteristics of assessment: (1) it consists of a systematic and continuous process; (2) it emphasizes student learning, with the cornerstone being what students can *do*; and (3) it focuses on the improvement of educational programs. The latter facet of assessment links it to quality and effectiveness and to evaluation and judgment. Thus, assessment has grown to imply a dichotomy of purpose: accountability and improvement of student learning.

Finally, Palumbo and Banta caution that since assessment is linked to an institution's mission and learning goals, the definition of assessment used on any particular campus may not work well on other campuses. They assert, "In order to gain the most benefit from assessment, faculty members and administrators at each institution must develop their own understanding of assessment."^{21(p3)}

Levels of Assessment

Assessment activities may concentrate on educational functions and outcomes at the macro or micro level. Since

assessment begins with the mission and educational values of an institution, the authors of this paper have decided to use a macro-to-micro focus. Table 1 lists some of the distinct categories of assessment commonly described in practice: institutional, program, and individual. Note that at the institutional level, assessment generally incorporates aggregated individual data. Similarly, at intermediate levels, such as college/school units and programs within these units, assessment often incorporates aggregate data. Common institutional and unit (eg, program, college) assessment data include information on student retention (eg, male, female, minority students), graduation (eg, rates, time to completion), and performance (eg, grade point average, licensure rates). At the individual level, data reflect student learning and faculty scholarly productivity. Although presented here as distinct levels, in practice, assessment data from the various categories can be used in overlapping ways. For example, student retention data can be reported and analyzed at institutional as well as college and program levels.

Assessment and Evaluation

Throughout the evolution of the assessment movement, the term "evaluation" also has been used in a num-

ber of ways and has sometimes been synonymous with the term “assessment.” Erwin provides guidance about the distinctions between *assessment* and *evaluation*. He asserts, “although the terms assessment and evaluation sometimes are used interchangeably, evaluation is generally used in a broader context, which might encompass institutional effectiveness beyond students’ learning and development.”²⁰ *Assessment* emphasizes the progress made by individuals towards stated educational outcomes. The assessment question is about whether students have demonstrated skills, abilities, or competencies as specified in previously stated educational goals or objectives. As a continuous data collection process, assessment highlights the relationship between educational programs and student learning and performance. Utilization of the data collected through assessment leads to *evaluation* processes that facilitate judgments about quality and effectiveness. The evaluation question extends beyond the specific demonstration of skills or abilities to issues about impact of programs or curriculum. Evaluation focuses on making judgments about students (eg, knowledge, attitudes and skills) in the context of questions about specific program or program goals (eg, student performance, retention, and graduation), or curriculum (eg, content or structure). Another distinction made by Upcraft and Schuh is “evaluation is any effort to use assessment evidence to improve institutional, departmental, divisional, or agency effectiveness.”²³

Assessment gained significance as a result of the desire of various constituents to hold universities accountable for educational outcomes. In the early 1980s, commissioned reports summarized collective knowledge on student outcomes as inadequate and indicative of poor institutional accountability. Consequently, attention to evaluation has increased, with a strong emphasis on student-learning outcomes. One primary function typically associated with evaluation is judging the effectiveness and particularly the efficiency of programs. The function of assessment has been for improvement in student learning and development. Assessment requires collection of data on individual students to monitor individual progress. The individual level data are aggregated student data and used by programs and schools to examine student-learning outcomes and to improve student learning and development for all students. Whereas evaluation decisions might focus on the programmatic use of resources, assessment decisions focus on the enhancement of student-learning outcomes.

Thus, evaluation is the part of the assessment process that involves interpreting the evidence and using the results. While the goal of assessment is improved student learning, evaluation considers all of the goals in the pro-

gram.^{21,23} Experts agree that faculty members, administrators, and staff members must use professional judgment in addition to assessment results to make decisions.

EDUCATIONAL ASSESSMENT RESEARCH IN *AJPE*

The purpose of this paper was to review the full-text research articles/notes that were published in the *Journal* from 1990 to 2003 and align this research within the framework presented in Table 1.

ERIC, MEDLINE and International Pharmaceutical Abstracts (IPA) searches were conducted to identify the articles in the *Journal*. Furthermore, to ensure that articles were not missed in the electronic search, a screening of *Journal* indexes using the key terms “assessing” and “assessment” was completed. However, it appears that in 1997 some changes were made in classification of the key terms for cataloging articles/notes in the *Journal* index; for example, an article that has the terms “abilities-outcomes” before the words “assess” or “assessment,” may not appear under the categorized key terms “assessment” or “assessing.” Therefore, the key terms were expanded in the search to include: “abilities-based,” “outcomes” linked to the words “assess” and “assessment” and to “program,” or “programmatic assessment.” Finally, a manual review of the table of contents of each issue of the *Journal* during this time period was conducted using the same key words.

The results of these searches revealed that since the early 1990s, 48 articles/notes and 116 abstracts addressing assessment have been published in the *Journal*. Space limitations restricted the literature review in this paper to 35 full-text articles that focused primarily on program, curriculum, or student assessment. Thus, the paper does not include a review of papers about the following topics: assessment of student support activities; student progression; academic standards; student employment in pharmacies; nontraditional curricular activities; assessment of clinical and/or medical outcomes; development and/or evaluation of various instruments; or a description of specific courses and how students were assessed and evaluated within those courses.

To gain a perspective on the volume of literature in higher education that is related to this assessment framework, a similar search in ERIC was conducted. The ERIC search of the education literature published between 1990-2003 yielded 86,500 citations using the key term “assessment.” Narrowing the ERIC search to include the key terms “assessment” and “higher education” resulted in 9,171 citations. These figures highlight the existence of a wealth of literature on educational assessment.

The next section summarizes the articles and notes from the *Journal* that are related to program, curriculum, or student assessment in pharmacy education. This literature covered assessment in the following areas: (1) assessing preselection attributes; (2) measuring student knowledge, attitudes, skills, and values; (3) curricular assessment; (4) graduates' perception of preparedness for practice; and (5) programmatic assessment. It is not the intent of this paper to provide a complete review of the methods, results, etc, outlined in all of these articles/notes. The purpose of this review is to categorize the research literature about pharmacy education assessment that has been published in the *Journal* within a framework of the different levels of assessment (program, curriculum, and individual).

As indicated above, assessment projects generally are conducted with either research macro or micro lenses. This continuum of levels has been divided into 3 discreet categories; however, assessment studies often pose questions that extend beyond these categories. The discussion begins with studies focusing primarily on the program level, followed by studies at the curriculum level, and concluding with studies at the individual assessment level. The institutional level is beyond the scope of this paper and will not be covered.

Program-Level Assessment. At the program level (college and school), assessment addresses factors important for the development of curriculum and degree programs, such as selection and recruitment of students, curricular improvements, and post-graduation studies. For example, Roche et al used a survey to determine factors that influence students' pharmacy school selection.²⁴ Students were most highly influenced by the reputation of the school and a friendly, reassuring academic environment. Furthermore, screening and definitive testing of students for learning disabilities early in an academic program can increase the students' performance levels and lower program attrition rates, according to a study by Boyd, McKenzie, and Holmes.²⁵

A study conducted by Wade et al covering a 3-year period looked at the effect of varying the method of instructional delivery using an instructor physically present in the classroom; an instructor on site half of the time and interactive videoconferencing the other half; and videoconferencing the entire class.²⁶ In these 3 types of instructional delivery, no impact (positively or negatively) on students' final examination scores was found, nor did the type of delivery affect instructor evaluations. Shuck and Phillips at Drake University conducted a 10-year assessment using a Myers-Briggs Type Indicator to examine trends in learning styles and personality types

and to compare pharmacy students with the general college population, and the PharmD degree program with the bachelor of science in pharmacy degree program.²⁷ Their conclusion was that a variety of learning/teaching strategies should be implemented when switching to abilities-based outcomes and active-learning strategies. Educators at the Texas Tech School of Pharmacy described the development and successful implementation of a modified Angoff method of determining minimum competencies for all 4 years of their curriculum.²⁸

In addition to course and competency evaluations, a study by Holdford and Reinders recommend the addition of a service quality assessment tool to measure students' perceptions of the quality of their education in pharmacy school.²⁹ This information can add another dimension to understanding student satisfaction and their approaches to learning.

Finally, Muzzin and Hornosty surveyed pharmacy graduates to determine how effective their formal and practical training was in preparing them for practice.³⁰ The survey polled graduates from 1950 through 1980 and covered 10 areas of pharmacy practice. Scott et al conducted a needs assessment of practicing pharmacists to determine their desire for pharmaceutical care training and for a nontraditional PharmD degree program or a certificate.³¹ The survey instrument also asked pharmacists about their perceptions of the types of skills students needed upon graduation. Bilger and Cherson surveyed registered pharmacists to determine if they needed a refresher course to update their skills.³² The survey instrument also asked respondents to suggest topics and the learning or instructional delivery format that would best meet their needs. Howard et al surveyed previous graduates to evaluate outcomes on several factors (ie, clinical activities, continuing education, service, etc) and gauge the school's contribution to developing their professional skills.³³ The school planned to use this baseline data on graduate outcomes in future comparison studies and as part of continuing program assessment. Finally, an assessment by Quinones and Mason of graduates in 1978, 1982, 1986, 1988, and 1990 to determine their success at reaching specific educational outcomes provided information for the School's curricular revisions.³⁴

In summary, these studies examined a range of program development concerns that included student recruitment and selection, student performance, a variety of program delivery and teaching/learning approaches, and post-graduation assessment of practicing pharmacists. The research reviewed above illustrates a few goals/purposes for assessment at the program level: for recruitment purposes, an examination of important fac-

tors influencing student choice of pharmacy program; for instructional delivery decisions, an examination of learning outcomes for different student learning styles; for assessing program quality by soliciting student perceptions; for examining preparation for practice by examining outcomes of formal and practical training components; and for alumni studies on graduate outcomes by examining the programs contributions to professional skills development. As seen in these studies, the focus of program assessment varies as do the unique needs of pharmacy education programs across the country.

Curriculum Assessment. Program delivery and teaching-learning concerns, as well as curriculum questions, can also be examined with an emphasis on the specific aspects of an educational program. The next studies cover general abilities/skills, discipline-specific abilities/skills, student progression (ie, entry, didactic, experiential), and graduates.

Studies that focused on general abilities and skills were completed by the following researchers. Ranelli and Nelson conducted a study to assess student's perceptions about their own writing skills.³⁵ Students completed a self-assessment about their confidence in their verbal communication and writing skills. The study also provided suggestions on how to include writing in the pharmacy curriculum. Parkhurst analyzed students' verbal communication skills to determine areas that needed curricular modification.³⁶ A program designed to provide information and skills to students in the area of substance abuse and addiction was assessed by McAuley and Akers.³⁷ The use of real-life situations (visiting a rehabilitation center and speaking with drug abuse counselors) not only increased self-rated scores of students' knowledge in this area, but also increased their comfort levels when confronted with substance abuse issues and their perceived ability to handle similar situations.

Curriculum questions have also been addressed in the *Journal*. Wallace and Franson developed a pharmacotherapy class that incorporated critical thinking, communication, and self-awareness abilities, which the students learned through various teaching methods (ie, lectures, readings, cases, group presentations, etc).³⁸ Students were able to practice these abilities and receive feedback on how to improve. Krause and Popovich developed a peer- and self-assessment process to use with students working in small groups.³⁹ Evaluation of that process provided feedback for curricular improvement within the school.

Finally, several studies focused on experiential knowledge and skills. Nelson and Maddox examined the clinical knowledge and skills of first professional degree

PharmD students in primary care practice settings using the primary care clerkship model.⁴⁰ Briceland and Hamilton conducted a study at their institution to determine which student or preceptor factors influenced pharmacy clerkship grades.⁴¹ Both studies indicated that higher GPAs and prior clinical pharmacy experience were positive predictors of the clerkship grade. Also, a greater number of students assigned to a preceptor was a predictor for students receiving lower grades on the clerkship rotation. Assessing student abilities/outcomes during pharmacy practice experiences presents a challenge because of the variety of experiences, sites, and preceptors involved. The Albany College of Pharmacy focused specifically on community pharmacy advanced practice experiences and developed a standardized outcomes and assessment document using the Center for the Advancement of Pharmaceutical Education (CAPE) criteria as their guide.⁴² This provided the college and students with clearly defined goals for establishing and assessing experiential education practices.

Other curriculum studies examined program outcomes. Mort et al described the development of an outcomes-based curriculum at South Dakota State University.⁴³ The plan at the College was to use these outcomes to assess student achievement and curricular effectiveness. The University of Nebraska College of Pharmacy, in their efforts to implement an outcomes-based assessment plan, surveyed all the deans of colleges and schools of pharmacy in the United States concerning the current methods being used to assess student abilities and competencies.⁴⁴ Through integration of several key instruments originating from the survey (eg, assessment surveys and clerkship outcomes assessment) and an effective process of Continuous Quality Improvement (CQI), the College has been able to incorporate an outcomes assessment plan into their pharmacy curriculum. Their Educational Outcomes Committee continually monitors assessment activities for needed revisions and/or amendments to the College's overall assessment plan in order to maintain the quality.

Others used outcomes to assist in developing their curricular and program assessment plans. Mort and Messerschmidt described how South Dakota State University reorganized their existing assessments and created a more efficient outcomes assessment plan for their pharmacy program.⁴⁵ Assessments were categorized into 3 interrelated "tiers," which enabled deficiencies to either be confirmed or refuted. Kirkpatrick and Pugh described how 2 assessments (faculty assessment of course coverage of competencies and student self-assessment of progress toward the fulfillment of the

entry-level PharmD competency statements) have been utilized effectively to evaluate the competency statements of the School of Pharmacy at Virginia Commonwealth University, while providing critical feedback for areas that may have needed improvement.⁴⁶ Mehavar and Supernaw described the steps implemented in developing an outcome assessment program using an annual, multiple choice examination to measure student competencies of stated curricular abilities.⁴⁷

The assessment of program curriculum, as with program assessment, reflects a variety of purposes and needs. Educators are interested in the contributions of curriculum content and delivery modes to students' general abilities; student writing/communication skills/confidence; enhancing knowledge acquisition through the use of real-life situations; providing learning opportunities through small group learning techniques; and student experiential knowledge and skills associated with primary care clerkship and community pharmacy advanced practices experiences. Aggregated data obtained from students at different levels (pre, first-year, advanced, graduate) in pharmacy programs were used in these curriculum research studies. Additionally, educational outcomes data were used for development of outcomes-based curriculum, implementing outcomes-based assessment plans as well as curriculum development.

Individual. Assessment for which the primary interest is the performance, learning, and development of the individual is the most common form. For example, Wongwiwatthanakit, Popovich, and Bennett assessed student knowledge using partial-credit and dichotomous scoring on 3 combined-response multiple-choice (CRMC) examinations in a nonprescription drug course for pharmacy students.⁴⁸ Partial-credit scoring provided a better representation of student knowledge. Adamcik et al used an interactive computer program to evaluate various aspects of students' critical thinking and problem-solving abilities.⁴⁹ Another research study of critical thinking skills and motivation for thinking critically was conducted at North Dakota State University College of Pharmacy.⁵⁰ Students in the 4-year PharmD program were evaluated each year using the California Critical Thinking Skills Test and the California Critical Thinking Dispositions Inventory. Interestingly, the results showed an increase in critical thinking skills over the 4 years, but the motivation to think critically remained virtually unchanged. Finally, Purkerson et al used an assessment center approach to create assessment exercises and evaluate students' abilities in 4 areas: group interaction, problem-solving, both written and interpersonal communication skills, and providing feedback for improvement.⁵¹ The significance of this pilot

work was that the authors introduced the concepts of an "assessment center" and "assessment-as-learning" into the pharmacy literature. In 1995, Purkerson et al continued their work using the assessment center approach by expanding the model to include an entire class (162 students versus 32 students in the pilot).⁵² The authors trained volunteer pharmacists to assess the larger number of students in this expanded project.

Various studies assessed performance and practice perspectives. Nelson and Maddox and Fielding et al examined practice and clinical knowledge, skills, and performance.^{40,53} Fielding et al developed and validated an objective structured clinical examination (OSCE) model for assessing practice knowledge and performance by practicing pharmacists. The results indicated that a practitioner's competence could be assessed with a 3-hour assessment of practice knowledge and, in some cases, a 2.5-hour, 20-station OSCE performance examination. A description of the development and validation of a performance assessment using Rasch modeling and classical test theory was detailed by Jackson et al.⁵⁴ These studies examined methodology for assessing individual educational outcomes as well as the actual performance and learning of individuals.

In a study of educational outcomes and performance, Monaghan et al developed a model program that assessed students' ability to perform clinical-based professional practice competencies.⁵⁵ The authors conducted a pilot study using standardized patients in an OSCE setting to evaluate students' performance outcomes. A second objective of the pilot study was to determine the reliability and validity of the model.

Individual-level assessment focuses primarily on educational outcomes of individual students in areas such as student learning and performance, critical thinking, communication skills, and clinical knowledge and skills. While the studies generally reported educational outcomes for pharmacy students, Wongwiwatthanakit, Popovich, and Bennett⁴⁸ compared student performance on classroom examinations using 2 scoring techniques: partial credit and dichotomous scoring techniques. The next section describes the few published studies that investigated the state of assessment across all colleges and schools of pharmacy.

STATUS OF ASSESSMENT IN PHARMACY EDUCATION

Several studies surveyed all of the colleges and schools of pharmacy in the United States to ascertain the status of assessment. Previously mentioned was the study conducted by the University of Nebraska College

of Pharmacy. In 1998, they surveyed all deans of colleges and schools of pharmacy to gather data about tools developed to assess or measure student abilities and competencies. They had a 64% response rate, indicating that colleges and schools were using the following approaches: (1) an assessment center approach; (2) objective structured clinical examination (OSCE); (3) educational outcomes assessment surveys; (4) clerkship outcomes assessment; and (5) a combination assessment approach. The most commonly used tool was the educational outcomes survey.⁴⁴

In 2000, Boyce surveyed colleges and schools of pharmacy about their program assessment activities and had an 84% response rate. Of the colleges and schools that responded to the survey, 38% had formal assessment activities; 28% had informal activities; and 34% had plans to develop assessment activities.¹⁰

Fifty-five (69%) US schools and colleges of pharmacy responded to a survey instrument by Bouldin and Wilkin asking about the current stage of implementation or use of programmatic assessment within their curriculum.⁵⁶ Although approximately 24 schools and colleges indicated they had a written plan of programmatic assessment, only 15 had a formally approved written plan of assessment. Another revealing finding was that only a few of those colleges and schools surveyed used performance-based assessments. The authors concluded that although progress was being made, there were still areas in programmatic assessment to be defined and developed within schools and colleges of pharmacy. They noted the benefits of collaboration with other educational programs further along in programmatic assessment, such as medicine, psychology, and education. In summary, while these research projects examined both program content or curriculum and student knowledge and skills, the emphasis was on assessing the effectiveness of a program or aspects of the curriculum.

The pharmacy literature reveals that colleges and schools of pharmacy have been conducting assessment activities at the classroom level, individual student/practitioner level, program and curricular level, and institutional level. Faculty and administrators are involved in a variety of assessment projects. The assessment data they gather is likewise used for a variety of purposes such as development of curriculum and degree programs (institutional level), student recruitment; design of curriculum and teaching-learning techniques (college-program level); and identification of academic needs and monitoring of progress (individual level). In pharmacy, as in other areas of education, assessment activities have become increasingly more common, prompting the asso-

ciation to commission a comprehensive report on assessment in pharmacy education. The paper includes higher education effectiveness, pharmacy education effectiveness, and teaching and learning approaches. Recommendations to facilitate the curriculum development process and learning outcomes assessment are also presented. These recommendations are detailed in a special article in the *Journal* entitled, "Excellence in Curriculum Development and Assessment."¹³

The focus of accreditation standards on educational outcomes augments the necessity for assessment in pharmacy education and reinforces the understanding that such activities are important and legitimate. Thus, pharmacy colleges increasingly feel the need to develop a systematic plan related to student outcomes assessment, while concurrently avoiding the possibility of overwhelming faculty members, administrators, staff members, and students.

THE EDUCATIONAL ASSESSMENT PLAN

What does the systematic assessment plan entail? An effective assessment plan (Appendix 2) reflects the educational mission of the institution or college.^{21,57-60} Thus, the assessment plan should flow from the mission of the institution and college and it should relate and align with the institution's plan and objectives. Assessment plans should be built on various principles (or a framework) that depict the organization's values and beliefs about assessment and institutional effectiveness. The American Association of Higher Education (AAHE) outlined 9 principles that may be adopted; in addition Banta et al identified a tenth principle (Appendix 3).⁶⁰ Readers may access these principles at the AAHE's website (<http://www.aahe.org/assessment/princip1.htm>).⁶¹

A key principle of assessment practice is that the process mirrors the values and ethical principles of the group conducting the assessment. Building an assessment plan on an articulated set of educational objectives and values will avert problems in cases where the results are ambiguous, unexpected, or counter to those desired. The assessment plan will give the group(s) charged with the responsibility of summarizing and reporting the outcomes and recommendations some guidance and structure for their choices. Subsequent actions related to continuous improvement or to enhance curricular or extracurricular options will also be rooted in a common set of values rather than those of the specific task. Challenges to the process can be met efficiently and with clarity.

Palomba and Banta stress that assessment is most successful when undertaken in an environment that is receptive, supportive, and enabling.²¹ More specifically, successful assessment requires an environment charac-

Table 2. Suggested Assessment Questions to Ask*

What do we collectively want our students to know, understand, and be able to do?
How will we know that they are learning what we hope they will?
How do our teaching practices, programs, services, and educational opportunities contribute to the learning?
What is the effect of our curricula, courses, teaching styles, and educational tools?
Where are the gaps in our students' experience and learning?
Do students have opportunities to build on previous learning, transfer learning into new situations, and reflect on their cumulative learning?
What kinds of evidence represent our students' learning - written texts, spoken texts, sets of behavior?
What kinds of evidence align with what and how students have learned? What evidence represents student's knowledge, understanding, habits of mind, ways of knowing and problem solving, behaviors, and dispositions?
What criteria will we use to examine this evidence and ascertain how well our students have achieved what we hoped they would?
Why do some cohorts of students meet our highest level of expectation, while others do not?
Is there a relationship between high level of achievement and our students' course-taking patterns or participation in learning support services?
Have all our students had ample, varied, and multiple opportunities to learn and to reflect on that learning?
Have we relied on ways of teaching that assume all students learn in the same way?
Did our changes bring about the effects we wanted?

*These questions were developed based on the writings and work of Boyce,^{10,11} Palomba and Banta,²¹ and Upcraft and Schuh²³

terized by effective leadership, administrative commitment, adequate resources (for example, clerical support, computer, software, and money), faculty and staff development opportunities, and time.

Recently, Maki emphasized that dialogue is essential in assessment. She states:

From our own disciplinary research and scholarship, we know that asking good questions leads to more – and deeper – questions. In the scholarship of our disciplines, we look at patterns to verify hypotheses. It is the same with assessment. We look at patterns of student performance to verify what our students are able and not able – to accomplish.⁶²

Therefore, we need to determine and discuss our expectations and incorporate them into our plan. This begins with dialogue – raising questions, seeking answers, interpreting evidence, implementing changes, and examining their effects. Consequently, educational assessment becomes integral to our work. Initial questions to pose include the following: (1) What are we doing? (2) Why are we doing it? and (3) How have/will we use assessment results? Table 2 lists a few suggested questions that a college or school of pharmacy may want to use as a catalyst for that dialogue.

The plan must engage all of the appropriate participants. All stakeholders should be included, both internal and external to the institution, college, or school. These

participants should be included: students, faculty members, staff members, administrators, alumni, employers, community partners, and other constituents important to the unit. Not all of the individuals will need to be involved at the same level; their degrees of involvement will vary. Thus, everyone maintaining an understanding of the assessment process and purpose is critical. Since assessment has multiple purposes, the participants within a unit must agree upon and understand the purpose of their selected assessment process. When developing strategies, the group should determine whether the assessment questions that are being asked are seeking to improve, inform, and/or prove.

The next step involves implementing the plan. This will include selecting various strategies for collecting the data that will answer the assessment questions that have been developed as discussed above. The college or school may want to use existing instruments, revise instruments, or develop their own, being careful to select appropriate tools that are reliable and valid. Experts advise using multiple data collection strategies that incorporate both direct and indirect measures and using both formative and summative processes. Develop a timetable that outlines when and by whom the data will be collected, when it will be analyzed, how and to whom the reports will be distributed, etc. More details about the instruments, data audit, and measurement criteria are discussed in another paper within this series.

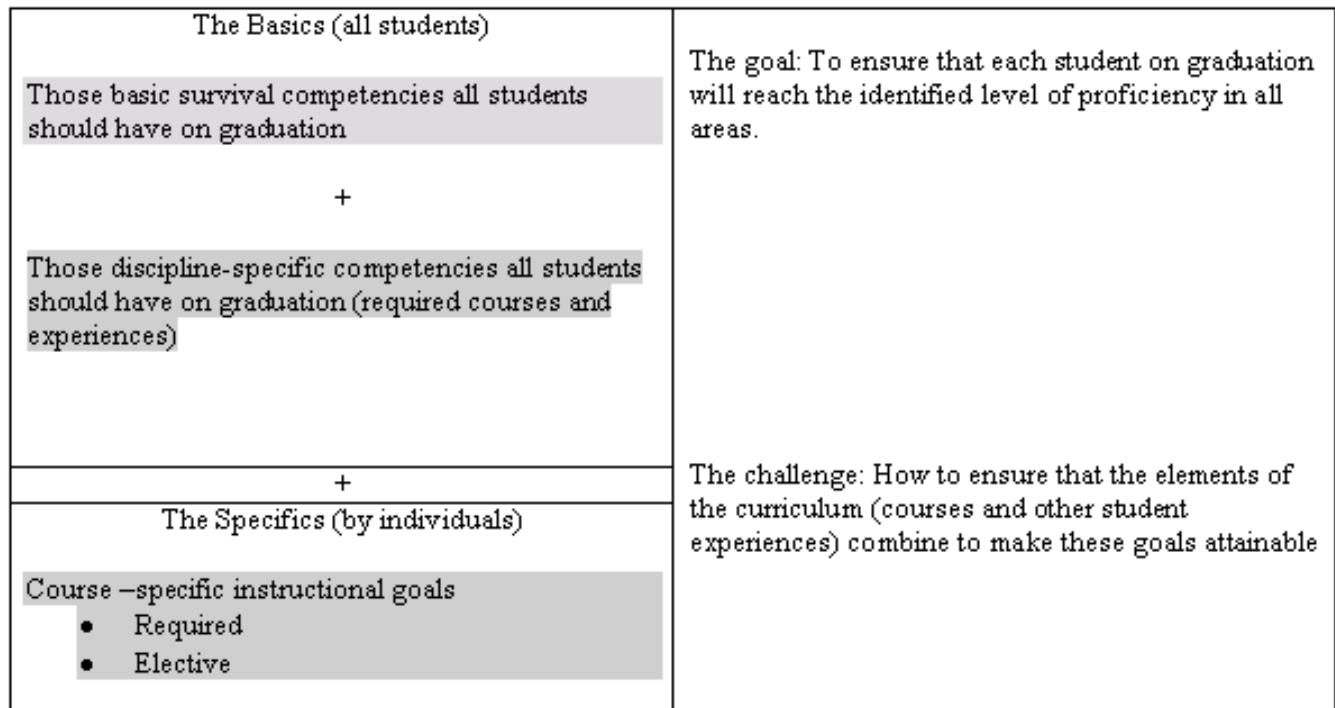


Figure 1. Three elements of outcomes. (Diamond, Robert M. *Designing & Assessing Courses & Curricula*. San Francisco, Calif: Jossey-Bass;1998, page 50. Reprinted with permission from John Wiley & Sons, Inc.)

Effective program assessment must link with teaching, learning, and curriculum assessment. Diamond states that there should be a close relationship between courses, curriculum, instruction, and assessment in order to enhance learning.⁶³

A curriculum must be developed sequentially, beginning with an institutional statement of goals and ending with the assessment of each student prior to graduation and after. As you move through the design process from defining general goals to developing course goals and then unit-by-unit objectives, statements of the goals become increasingly specific. The design of each course, the selection of instructional methods, and student assessment will be based on these statements.

This linkage requires careful planning, skilled teaching, and an overall structure, content, and process focused on completing the assessment loop (Figure 1). The assessment process does not end with the collection of information. Vital to the process is the digestion of the results, namely analysis and interpretation of the information. Identifying target audience(s) (Appendix 2) in the planning essentially points to key stakeholders in the educational process. The assessment process and results will have impact on groups other than pharmacy faculty members, administrators, and the assessment coordinator/staff members. Faculty members and students need feedback for enhanced teaching/learning and student development. Students unable to demonstrate required competencies should be refused licenses and kept from practice as safeguards for the

public and the profession. Program administrators need to use results to adjust strategic planning activities and budgetary considerations. Public consumers making use of pharmaceutical services need assurance that assessment practices are rigorously monitored.

A thorough plan for assessment will include methods for evaluating the assessment program itself for effectiveness. The plan should be reviewed to determine the following: (1) if it links to the mission; (2) if the data generated is used; and (3) if it leads to improvements in the program, curriculum, and/or student learning.

Finally, it is better to get started than not get started. Programs are advised to begin the process, setting a goal to revise the plan as necessary, and not delay beginning their assessment programs by waiting to have a complete plan. Palumbo and Banta caution, “Remember, plans are often written and rewritten based on experience, so getting started with a less-than-perfect plan in place is sometimes a good choice.”^{21(p52)}

Value of a Plan

Putting academic assessment plans in writing is a challenging and time-consuming task; however, the value of having a written plan is considerable. First, the plan serves to anchor the process to one set of expectations about educational outcomes and student achievement. The written plan is useful as assessment tools are developed and piloted to ensure consistency of purpose and style.

Table 3. Characteristics of an Institution With a Comprehensive Culture for Student Assessment*

1. The institution's organizational and administrative pattern for student assessment is fully developed. It has a well-formulated approach to student assessment, an institution-wide strategy to support it, a well-developed set of policies and practices to promote it, and it uses student information for educational decisions and monitors its impact.
2. The purposes for undertaking student assessment are clearly understood by all campus constituencies.
3. Institutional, information-based, and human resource strategies for student assessment are evident.
4. Student assessment is well integrated with the institution's academic management approach and its educational improvement efforts, and
5. All forms of leadership for student assessment (external, strategic, process, and technical) are present and visible.

* Based on information in: Banta TW and Associates. *Building a Scholarship of Assessment*. San Francisco, Calif: Jossey-Bass Publishers; 2002:45-6.

Data collection may be a semester or more in time away from the planning phase. Without a written assessment plan as an anchor, the process is likely to drift rather than evolve in intentional ways. Further, the written plan helps ensure that results are processed as originally intended and in a consistent manner across multiple occasions. Finally, a written plan identifies the minimum set of results to report. Although new analyses may become possible along the way, the plan should stipulate specific expected results with reference to some predetermined criteria demarcating various thresholds of success and recipients of the information. Data may need to be shared with multiple parties—some to evaluate instructional effectiveness; some to consider new policies or programs; and still others to justify new budgetary requests. Without a systematic plan, assessment frequently loses focus, impact, and value. The reader is referred to Boyce and Winslade for additional suggestions about implementing pharmacy education assessment plans, as well as other references in the higher education literature about the value and desired features of assessment plans.^{10-12,16,21}

Culture of Assessment

Institutional culture plays a critical role in the success and value of assessment efforts. Plans cannot be effective until the institution and/or unit (college or school) develops a culture for assessment and builds a sustainable commitment within the organization. Building this culture requires the necessary leadership support and allocation of resources to establish, implement, and maintain the plan. AAHE principle 5 (Appendix 3) suggests, "Assessment works best when it is ongoing, not episodic." This implies that the assessment process is flexible, adaptable, and constantly updated to reflect the changing needs of the institution, college, school, or program. Further, this principle encourages the unit to develop a culture of assessment. Banta et al assert:

Effective assessment programs become embedded in the institutional culture. They are acknowledged, discussed, deliberated, reviewed, and refined. Effective

assessment is perceived as an integral part of the overall educational missions. And it focuses, very simply, on learning.⁶⁴

Further, Banta et al completed a systematic study to obtain evidence on the organizational and administrative patterns and strategies that have been adopted to support assessment.⁶⁴ From this research they proposed 7 domains of organization and administrative support for student assessment: (1) external influences on student assessment; (2) institutional context (type, public, private, size); (3) institutional approaches to student assessment; (4) institution-wide support for student assessment; (5) assessment management policies and practices; (6) institutional culture and climate for student assessment; and (7) the uses and impact of student assessment (improvement and decision-making). This research culminated with a recommendation that an institution with a comprehensive culture for student assessment would epitomize the characteristics that are listed in Table 3.

A college or school of pharmacy can adapt beliefs and practices to create a culture of assessment within their unit similar to the institutional culture described in the discussion above. Initially the college or school must ensure that assessment is aligned with their organizational mission and with the greater institutional mission. The college or school should ultimately articulate their educational beliefs and values while developing this cultural shift. Next, the college or school should identify its purpose for the assessment and determine whether it is to improve, inform, and/or prove. This purpose must become part of the culture and accumulated knowledge of all the participants. Finally, a culture of assessment will clarify that assessment is not about faculty evaluation; instead, it will focus attention on student learning.

CONCLUSIONS

This paper presents a primer on assessment in higher education to help faculty members who are developing an initial assessment program or revising an existing assessment program. The primer describes a rationale for

the emergence of assessment in higher education, various definitions, the distinction between assessment and evaluation, and the levels of assessment.

Next, to establish a perspective on research that has been conducted about assessment in pharmacy education, the paper provides a review of selected articles that have been published in the *Journal* from 1990-2003. The literature revealed that colleges and schools of pharmacy have conducted a number of assessment activities at all levels: institutional, program, curricular, and individual. The authors discovered that only a few studies conducted prior to 2000 had reviewed the status of assessment in all colleges and schools of pharmacy. Perhaps an area for future research would be to review the current status of assessment at the colleges and schools and determine similarities, differences, and best practices. Furthermore, gathering copies of assessment plans from the various colleges and schools and publishing them in the *Journal* or on the website may provide useful information for others.

The paper summarizes the need for and value of an assessment plan and presents various aspects of an effective plan, including building a culture of assessment. A final question begs to be answered: "Will assessment in higher education ever go away?" Many higher education experts and policymakers agree that is unlikely. Suskie, an assessment expert, responds in the following way:

Not likely, one obvious reason is that federal regulations aren't likely to go away. A far more important reason, however, is that higher education's sharpened focus on helping students learn is likely to stay with us. Assessment is a critical tool to help ensure that teaching and learning in colleges and universities are the best that they can be. Another emerging reason for the persistence of assessment is the growing trend to award certificates and licenses based on demonstrated learning rather than "seat time." It is possible that, within a few years, increased demand for this kind of certification will force college diplomas to bear seals certifying that graduates have, say, a certain level of writing skill or technology skill – and this can only happen with carefully designed assessment strategies.⁶⁵

Thus, it is in the best interest of pharmacy colleges and schools to remain aware of the emerging changes in assessment practices and revise assessment plans, processes, and methods as needed to remain contemporary. Only through a continuous and systematic process with full collaboration among all vested individuals can a true culture of assessment be attained.

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Appendix 1. American Council on Pharmaceutical Education (ACPE) Standards 2000. Accreditation standards relating to assessment.

Standard No. 3 SYSTEMATIC ASSESSMENT OF ACHIEVEMENT

The College or School of Pharmacy should establish and maintain a system that assesses the extent to which its mission, goals and objectives are being achieved. Formative and summative indicators of achievement should be identified and employed in a continuous and systematic process of evaluating the outcomes of the educational, research, service, pharmacy practice programs. Evaluation should extend beyond the acquisition of knowledge by students to the application of knowledge and skills in the care of patients in improving medication use. The College or School should show evidence of using analysis of outcome measures throughout the educational, research, service and pharmacy practice programs, for purposes of continuing development and improvement, including revisions in curriculum, and modifications of faculty and student policies.

Guideline 3.1

Information regarding the effectiveness of the professional program in pharmacy, particularly in the form of student achievement, should be gathered systematically from sources such as students, alumni, state boards of pharmacy and other publics, professional staff of affiliated practice facilities, and a variety of other practitioners. The results of student exit interviews, preceptor evaluations, alumni surveys, and standardized licensure examinations should be appropriately employed in the assessment system of the College or School; other indicators of programmatic and student achievement that assess the extent to which the mission, goals and objectives are being achieved should be developed and appropriately applied.

Standard No. 13 STUDENT EVALUATION

The College or School of Pharmacy should establish principles and methods for formative and summative evaluation of student achievement. A variety of evaluation measures should be systematically and sequentially applied throughout the professional program in pharmacy. Assessments should measure cognitive learning, mastery of essential practice skills, and the abilities to communicate effectively and to use data in the problem-solving process. Evaluation processes should measure student performance in all of the professional competencies in accord with outcome expectations.

Guideline 13.1

The system of student evaluation utilized by the College of School should foster self-initiated learning. Test procedures should condition students for the integration and application of principles, critical thinking, and problem solving rather than for short-term retention or memorization of specific details or isolated facts.

Standard No. 14 CURRICULUM EVALUATION

Evaluation measures focusing on the efficacy of the curricular structure, content, process, and outcomes should be systematically and sequentially applied throughout the curriculum in pharmacy. Evidence should exist that evaluation outcomes, including student achievement data, are applied to modify or revise the professional program in pharmacy.

Guideline 14.1

A system of outcome assessment should be developed which fosters data-driven continuous improvement of curricular structure, content process, and outcomes. Evaluation of the curriculum should occur systematically in order to monitor overall effectiveness, to enable the achievement of professional competencies in accord with outcome expectations, and to provide a studied basis for improvement. The ongoing evaluation process should include input from faculty, students, administrators, practitioners, state board of pharmacy members and other publics. The curriculum as a whole, as well as individual courses, should be evaluated with respect to the goals and objectives for the professional program in pharmacy. Experimentation and innovation within the curriculum in pharmacy should occur continuously. Experimental or innovative approaches should be adequately planned and coupled with an appropriate evaluation system. Evaluation should assure that the curriculum is responsive to changes in pharmacy practice as well as to changes in educational technologies, and insure that an educational setting and methods of instruction exist that maximize the development of effective and efficient learning experiences.

Guideline 14.2

A curriculum committee or other appropriate body with defined authorities and responsibilities, should be in place to manage an orderly and systematic review of the curriculum structure, content, process and outcomes. Duties of this committee should include assurances for coordination of course material, minimization of unwarranted repetition, deletion of outdated or unessential content, and provision of a reasonable course load for students. A curricular editing process should assure that additions are counterpoised with deletions. The appropriateness of emphasis, presentation mode, and proper sequencing should be considered so as to provide the optimal environment for learning. The committee should assess the extent to which innovative teaching methods are effectively deployed, and outcome measures are systematically applied for purposes of improvement.

Appendix 2. Suggested outline for an assessment plan.*

- I. College Mission
 - a. Describe the college/school mission
- II. College Goals and Objectives
 - a. Describe the goals and objectives and link them to the strategic plan and indicate the assessment measures
- III. Program and Learning Outcomes
 - a. This section should explain the specific list of what faculty, staff and students must do, and outcomes which will be measurable and meaningful. Appropriate university and accreditation program standards should be incorporated such as:
 - i. Intended Program Outcomes
 - ii. Intended Process Outcomes
 - iii. Intended Student Learning Outcomes
 - iv. Intended Student Development Outcomes
 - v. Intended Faculty Development Outcomes
 - vi. Intended Staff Development Outcomes
- IV. Assessment Methods
 - a. This section should specify what we are looking for and how we will find it. The following elements should be included when discussing the evaluation method for each outcome:
 - i. Target audience
 - ii. Data collection
 - iii. Tools used
 - iv. Data Analysis
- V. Implementation of Assessment Plan
 - a. This section should describe who will be doing what and when they will be doing it. For example who is responsible for collection of data, data analysis, writing the results, reporting them, and making a decision on results and in what time frame? Resource limitations can also be listed in this area.
 - i. Who is responsible for what?
 - ii. Timeline: the timeline will demonstrate commitment to continuous assessment; it will identify parts that are conducted every year, every semester, bi-annual, etc.
- VI. Results
 - a. This section should describe what did the results of the assessment show? What did we learn about the outcomes stated above? What was the assessment plan not able to tell us?
- VII. Decisions and Recommendations
 - a. Based on the results, what decisions will be made about the program, planning, policies, and the assessment plan. This section should describe what was changed? What was kept?
 - i. Program
 - ii. Planning
 - iii. Policy
 - iv. Assessment

*This outline was developed based on the writings and work of: Palomba, C.A., Banta, T.W., Upcraft, M.L., Schuh, J.H., Southern Association of Colleges and Schools, NC State University Assessment site and James Madison University assessment site. Citations are included in reference list (references # 13, 49, 50, 51 and 52).

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Appendix 3. American Association of Higher Education (AAHE) Nine Principles of Good Practice for Assessing Student Learning

<p>Principle 1: <i>The assessment of student learning begins with educational values.</i></p>	<p>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 them 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>
<p>Principle 2: <i>Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed in performance over time.</i></p>	<p>Learning is a complex process. It entails not only what students know but what they can do with what they know; it involves not only knowledge and abilities but values, attitudes, and habits of mind that affect both academic success and performance beyond the classroom. Assessment should reflect these understandings by employing a diverse array of methods, including those that call for actual performance, using them over time so as to reveal change, growth, and increasing degrees of integration. Such an approach aims for a more complete and accurate picture of learning, and therefore firmer bases for improving our students' educational experience.</p>
<p>Principle 3: <i>Assessment works best when the programs it seeks to improve have clear, explicitly stated purposes.</i></p>	<p>Assessment is a goal-oriented process. It entails comparing educational performance with educational purposes and expectations -- those derived from the institution's mission, from faculty intentions in program and course design, and from knowledge of students' own goals. Where program purposes lack specificity or agreement, assessment as a process pushes a campus toward clarity about where to aim and what standards to apply; assessment also prompts attention to where and how program goals will be taught and learned. Clear, shared, implementable goals are the cornerstone for assessment that is focused and useful.</p>
<p>Principle 4: <i>Assessment requires attention to outcomes but also and equally to the experiences that lead to those outcomes.</i></p>	<p>Information about outcomes is of high importance; where students "end up" matters greatly. But to improve outcomes, we need to know about student experience along the way -- about the curricula, teaching, and kind of student effort that lead to particular outcomes. Assessment can help us understand which students learn best under what conditions; with such knowledge comes the capacity to improve the whole of their learning.</p>
<p>Principle 5: <i>Assessment works best when it is ongoing not episodic.</i></p>	<p>Assessment is a process whose power is cumulative. Though isolated, "one-shot" assessment can be better than none, improvement is best fostered when assessment entails a linked series of activities undertaken over time. This may mean tracking the process of individual students, or of cohorts of students; it may mean collecting the same examples of student performance or using the same instrument semester after semester. The point is to monitor progress toward intended goals in a spirit of continuous improvement. Along the way, the assessment process itself should be evaluated and refined in light of emerging insights.</p>
<p>Principle 6: <i>Assessment fosters wider improvement when representatives from across the educational community are involved.</i></p>	<p>Student learning is a campus-wide responsibility, and assessment is a way of enacting that responsibility. Thus, while assessment efforts may start small, the aim over time is to involve people from across the educational community. Faculty play an especially important role, but assessment's questions can't be fully addressed without participation by student-affairs educators, librarians, administrators, and students. Assessment may also involve individuals from beyond the campus (alumni, trustees, employers) whose experience can enrich the sense of appropriate aims and standards for learning. Thus understood, assessment is not a task for small groups of experts but a collaborative activity; its aim is wider, better-informed attention to student learning by all parties with a stake in its improvement.</p>

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<p>Principle 7: <i>Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.</i></p>	<p>Assessment recognizes the value of information in the process of improvement. But to be useful, information must be connected to issues or questions that people really care about. This implies assessment approaches that produce evidence that relevant parties will find credible, suggestive, and applicable to decisions that need to be made. It means thinking in advance about how the information will be used, and by whom. The point of assessment is not to gather data and return "results"; it is a process that starts with the questions of decision-makers, that involves them in the gathering and interpreting of data, and that informs and helps guide continuous improvement.</p>
<p>Principle 8: <i>Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change.</i></p>	<p>Assessment alone changes little. Its greatest contribution comes on campuses where the quality of teaching and learning is visibly valued and worked at. On such campuses, the push to improve educational performance is a visible and primary goal of leadership; improving the quality of undergraduate education is central to the institution's planning, budgeting, and personnel decisions. On such campuses, information about learning outcomes is seen as an integral part of decision making, and avidly sought.</p>
<p>Principle 9: <i>Through assessment, educators meet responsibilities to students and to the public.</i></p>	<p>There is a compelling public stake in education. As educators, we have a responsibility to the publics that support or depend on us to provide information about the ways in which our students meet goals and expectations. But that responsibility goes beyond the reporting of such information; our deeper obligation -- to ourselves, our students, and society -- is to improve. Those to whom educators are accountable have a corresponding obligation to support such attempts at improvement.</p>
<p>Principle 10*: <i>Assessment is most effective when undertaken in an environment that is receptive, supportive, and enabling.</i></p>	<p>More specifically, successful assessment requires an environment characterized by effective leadership, administrative commitment, adequate resources (for example, clerical support and money), faculty and staff development opportunities, and time.</p>
<p>*Identified by Banta TW, Lund JP, Black KE, and Oblander FW. <i>Assessment in practice: putting principles to work on college campuses</i>. San Francisco, Calif: Jossey-Bass Publishers; 1996. <i>Permission to use granted by American Association of Higher Education</i>. Available at http://www.aahe.org/assessment/principl.htm. Accessed June 24, 2004.</p>	