

# **Outcomes Assessment Resource Guide for Schools and Colleges of Optometry**

***Developed by the ASCO Task Force on Outcomes Assessment***  
June 24, 2001

***Revised by the ASCO Academic Affairs Committee***  
March 22, 2014

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## Abstract

The Outcomes Assessment Resource Guide for Schools and Colleges of Optometry is designed to provide a basic orientation to outcomes assessment. The Guide defines outcome assessment and discusses methods for effectiveness. The Guide references American Council on Optometric Education (ACOE) standards for accreditation, making it a useful resource tool for new schools as well as schools whose programs are due for reaccreditation. This document is also a useful guide for any program which is in need of evaluating and/or updating its own current system of outcomes assessment.

## Keywords

Outcomes, assessment, program, performance, competency, educational research

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## Introduction

### ***What Is Outcomes Assessment?***

Outcomes assessment is the primary evaluative portion of the strategic management of a student, course, program or institution. An outcome is the result of a particular activity or program (Hollenbeck et al, 1999). Strategic management is a process designed to achieve the results (or outcomes) defined in mission, goals and objectives statements.

The essential steps of assessment which provide institutional effectiveness demonstrate the nature of the management process (Figure 1; Nichols, 2000 and Walvoord, 2010). Due to its circular nature, each portion of the process is essential in assuring that the intended outcomes are achieved.

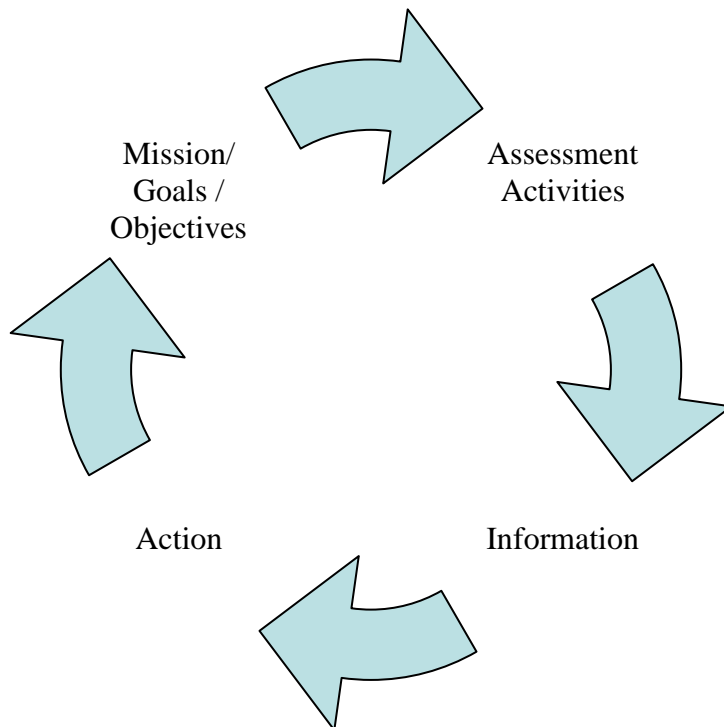


Figure 1. Essential Steps of Assessment (modified from Nichols, 2000 and Walvoord, 2010)

- (1) Mission, goals and objectives provide direction for management and allow the application of necessary resources to achieve the intended outcomes.
- (2) Assessment activities are used to achieve the mission/goals/objectives.
- (3) Results from assessment activities provide information which demonstrates the extent to which the outcomes are achieved.
- (4) Assessment results provide direction to formulating improved strategies to achieve the mission/goals/objectives at the next iteration. Taking appropriate action with modifications is in order when outcomes are not achieved or when improvement is desired.

The failure to execute any aspect of the paradigm or failing to maintain the connections of the different parts threatens the success of the entire program.

The institutional effectiveness paradigm can and should be applied at many levels. If applied to an institution (or program), a number of related versions of the model above should be aimed at the various goals and objectives for each part of the mission statement. Similarly, the effectiveness program can be aimed at learning within an individual course, and as such, it may be simpler than that applied to programs or institutions. Ideally, an institution will have interlocking methods for assessing effectiveness that connect the institution to programs to individual students within and across all courses in the curriculum. Although any single paradigm can be straightforward, connecting effectiveness paradigms across programs and courses and students are challenging to develop and manage and to keep connected.

In summary, outcomes assessment is a part of the process of managing an activity or program so that:

- The mission, goals and objectives are clearly stated.
- The outcomes of the program or activity are assessed (i.e. measured or examined) using appropriate tools designed for the task.
- The data gathered from the assessment activities (e.g. exam scores, clinical performance, board exam pass rates, student evaluations of teaching, exit interviews, career placement) are utilized to determine extent of success in achieving goals. And,
- Modifications to the program or activity are made in order to obtain or maintain the desired outcomes of the program or activity.

The assessment portion of this process provides feedback about the effectiveness of the program or activity.

### ***What Drives Assessment?***

Two major issues drive assessment and it may be difficult to untangle them or to parse their relative importance. One obvious driver for assessment is the various oversight agencies (government {state and/or federal}, accreditation agencies, or institutional management). These agencies have in common a desire to certify the extent to which an institution or program is achieving its mission, goals and objectives.

The American Council on Optometric Education (ACOE) requires appropriate outcomes assessments for optometric educational programs as part of the accreditation process (Professional Optometric Degree Program Standards 2009, Standards 1.3, 2.3, 2.4, 2.6, 2.7, 2.10.2, 5.4, 8.2.5). The ACOE “recognizes the importance of identifying and assessing educational and programmatic outcomes as a means to define and measure the quality of educational programs. It has woven outcomes assessment throughout its Standards of Accreditation (COE, 1998 then ACOE, 2009).” Crucial to the understanding of assessment required by the ACOE is that programs are required to select assessment tools that are appropriate for each program. Schools and colleges, therefore, should tailor

an assessment program for their own particular mission, goals and objectives considering the resources available and the needs of the program.

The most important driver of assessment, however, should be the desire to make good institutions, programs, courses and students better. Achieving the best results necessarily discovers a role for assessment (as described in Figure 1 above). Achieving intended results requires mission, goals and objectives; assessment activities; and, the use of the results. Faculty should play the most significant role in each of these assessment processes.

### ***Effective Assessment***

An effective assessment program should provide information organized to efficiently evaluate the effectiveness of the entity being examined. Either too much, too little or inappropriate information is a problem. Assessment gives insight into the success of the mechanism producing the outcome. Without knowledge of the outcomes, it is impossible to make critical adjustments and modifications to the mechanism.

An effective assessment process plays an important role in *demonstrating the achievement* of an institution, a program, a course or a student. In addition, however, an effective assessment process provides data to *guide and improve achievement*.

Tips for effective assessment:

- The purpose of assessment must be to improve the educational program.
- Information collected must truly reflect the achievement of the mission/goal/objective; otherwise valuable time, effort and resources are wasted.
- Information which is collected must be organized, in order for it to be effectively utilized.
- Information collected must be provided to the appropriate users of the data.
- Assessments should be completed on a regular basis in order to effectively control the process.
- Diversity should be provided in the groups of individuals surveyed. Programs should identify individuals from on and off-campus that they would like to involve in their outcomes assessment.
- A good assessment program is multi-factorial and uses different sources to consider the many facets of a desired outcome. Using only student evaluations of teaching, for example, while critically useful in gaining student perspectives on the effectiveness of the subject taught, does not evaluate the direct outcome of a course or program like certain performance measures (national or state boards or course-embedded performance tests (i.e., practical examinations) and may limit may the view of the program's achievements or its progress.
- The assessment process itself must be evaluated.

Common pitfalls of assessment (Walvoord, 2010)

- Mere compliance with external demands
- Gathering information no one will use
- Making the process too complicated

## Assessment System

While individual courses, activities and programs within a School/College of Optometry should each have its own method of assessment, an overall system for assessment should be adopted and followed in order for the School/College to successfully achieve its goals. Within this system, methods of assessment and roles of committees and leaders should be clearly delineated. An assessment system can be applied to a diagram such as the one below (Figure 2; modified from Walvoord, 2010). This diagram should be read from the bottom up.

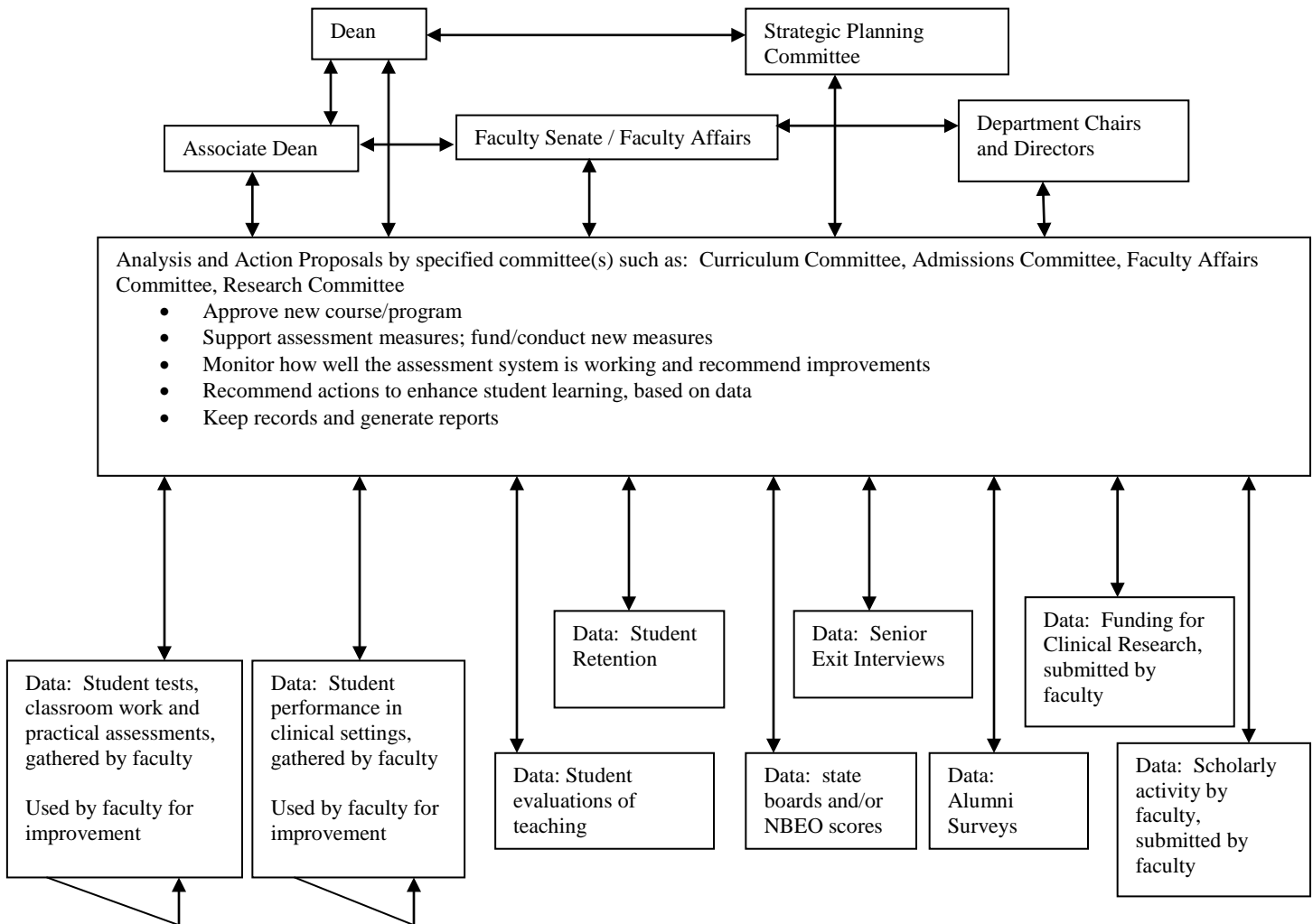


Figure 2. Example of Ideal Assessment System, modified from Walvoord, 2010.

Effective assessment systems manifest the following characteristics (Table 1, modified from Palomba & Banta, 1999) as their philosophical foundation. A weakness or absence of any of these essentials places the entire program at risk.

Table 1. Essentials for assessment programs (modified from Palomba and Banta, 1999)

CHARACTERISTIC	COMMENT
1. Agree on the goals and objectives	Since the goals and objectives drive the whole process, they must be clearly stated and understood by everyone involved in the process.
2. Design and implement a thoughtful approach to assessment planning	Assessment programs must involve the appropriate individuals who must understand and be a part of the process. The person(s) who are responsible for each step should be clearly delineated. A good description of how the data are to be used is critical in allaying any fears of participants.
3. Involve individuals from on and off campus	A good assessment program involves many different sources to achieve objectivity and an evaluation of the use of the final products of the program. External groups or data are likely to use criteria specific to their situation. This may provide insight into the manner in which the products (typically students) function in a non-academic situation.
4. Select or design and implement data collection approaches	Only useful data must be collected and the collection of the data must be as efficient as possible and collected from appropriate sources. Data must be collected that meet the needs of the program from the standpoint of allowing modification of the process to achieve a desired result.
5. Examine, share and act on assessment findings	To be effective, the individuals affected by the assessment must know the results. Feedback from assessment techniques must be used to control the outcome of the process. Failure to use the data means that the assessment program, even if elaborate and otherwise effective, fails to achieve its most basic purpose, to make possible better outcomes.
6. Regularly reexamine the assessment process	Assessment programs examine dynamic, constantly changing outcomes. As such, the assessment program itself should be constantly reexamined to make sure it is as effective and efficient as possible.

## Outcomes Assessment Statements and Basic Competency

Achieving good statements to define the outcome of a process is a critical step in the successful management of that institution, program, course or student. Basic competency statements are statements of the outcomes of a professional program.

The document describing basic competencies for entry-level optometrists (Heath et al, 2000; updated 2012) describes the knowledge, skills and values that graduating optometry students should demonstrate. Methods must be developed to confirm the competencies of graduating optometry students. The results of these assessment methods reflect the quality of optometric graduates from any given School/College of Optometry, and can be utilized by the educational institutions to document achievement and/or manage deficiencies.

Programs may find it helpful to re-organize their basic competency statement into broad categories with appropriate knowledge, skills and values for each. The resulting fewer outcomes may allow a more manageable assessment task.

Good outcomes data are:

- Clear and understandable
- Direct and explicit in meaning
- Reflective of current philosophies, actions and intentions
- Written in short, simple sentences that state only one thought
- Quantifiable and measurable (ACOE, 2011)

Questions to be used in deriving outcomes statements are (ACOE, 2011):

- What do we want to accomplish?
- What is it we say we do?
- What is it that we want our graduates to be able to do?

Good examples of outcomes statements are:

- The entry-level Optometrist must understand and have skill in the prevention, diagnosis, treatment and management of systemic conditions and processes that relate to vision.
- The entry-level optometrist must demonstrate appropriate personal professional and ethical values.
- The student must demonstrate competency in performing Goldmann tonometry.

Outcomes are the objectives of an institution, program or course. They are the desired endpoints or achievements of the activity.

## **Characteristics of Assessment Measures**

Assessment activities can be broadly classified as either *perception* about the outcomes or measures of the *performance* of the outcomes. Perceptions are subjective assessments and can be powerful measures of the opinions of the various participants or observers about various items within a program. Performance measures are designed to directly examine the outcome of items within a program (or course, etc.). Frequently, perceptions are most useful in helping to explain the performance of some aspect of the program.

Many other features of assessment activities should be considered when developing or using assessment tools. Some of these are described in Table 2. A brief examination of these characteristics demonstrates the challenges involved in understanding the ramifications of the assessment tools. Of course, a given tool can be tightly controlled or relatively uncontrolled as long as the tool meets the needs of the program. Of the many characteristics listed below, the priority and cost as well as thinking about validity, accuracy, strengths and weaknesses are especially critical for the successful selection of a tool.



Table 2. Characteristics of outcomes assessment measures

CHARACTERISTIC	DESCRIPTION
Assessment Tool	The assessment tool is a brief (clear and simple) description of the assessment activity.
Priority	The priority of the assessment tool ranges from “1” (required), “2” (helpful), “3” (possible) to “NA” (not applicable). Tools with priority of “1” are recommended assessment tools. This score is a subjective assessment of the significance of a given tool in obtaining a complete and accurate examination of a given standard.
Type	<ul style="list-style-type: none"> <li>• <u>Internal or external</u>. This describes whether the assessment data are collected from sources external or internal to the institution.</li> <li>• <u>Direct or indirect</u>. This describes the nature of the data being drawn. A direct measure is where the knowledge, skill or value is being measured without intermediary steps, individuals or systems. An indirect measure does not measure the knowledge, skill or value in question but rather examines some proxy.</li> <li>• <u>Qualitative or quantitative</u>. Quantitative data is numerical data with at least ordinal properties. Qualitative data includes controlled subjective assessments from surveys as well as comments or observations that may be relatively uncontrolled in nature.</li> <li>• <u>Perception or performance</u>. This describes whether the assessment tool examines perceptions about the outcomes (subjective, surveys) or the performance of the program (objective, data).</li> </ul>
Responsible	The responsible category specifies who is charged with responsibility for the assessment activity in question.
Calendar	Assessment activities should be regularly completed. The calendar describes the appropriate cycle for the assessment activity.
Targets	The target of the assessment activity is the ultimate source of the assessment data.
Data	This specifies the data used by the tool. It ranges from surveys, discussions to questionnaires to transcripts, policies, databases and others.
Data source	The data source specifies the repository from which the assessment data is drawn.
Validity	Validity implies that a tool measures the desired characteristic and encompasses reliability. Invalid data is misleading in that the response may not be representative of the larger sample from which it is drawn because it does not really assess the appropriate attribute among other reasons.
Accuracy	An assessment is accurate if it is a true measure of the activity in question. For example, a clinical skills test may be an accurate measure of a student’s ability to perform a given skill in the clinic. A written test about the same skill may be a good test but may not indicate the student’s ability to actually complete the skill.
Strengths	This is a brief listing of some of the strong points of the assessment activity.
Weaknesses	This is a brief listing of some of the limitations of the assessment activity.
Relevant ACOE standard	This lists the ACOE standard to which the assessment activity is being addressed.
Linkage to goals and objectives	This describes the goal or objective to which the assessment activity is directed. Without an appropriate link, an assessment tool represents a waste of time, effort and resources.
Response rates	The response rate provides the expected portion of the available data that is being captured by the assessment activity.
Questionnaire link	This specifies the questions on the surveys that are linked to this outcome.
Feasibility	This describes the feasibility of collecting the data in question.

CHARACTERISTIC	DESCRIPTION
Cost	This is an assessment of the cost of using the assessment tool. Cost estimates range from \$ (inexpensive), \$\$ (cost involved), \$\$\$ (very expensive, prohibitive). This is not the cost of the activity in question, e.g., research, but is the cost of using the tool to examine the outcome
Methods	This is a brief description of the methodology involved in the assessment process.
Uses of data	This is a brief description of the way the data is used.

## Basic Methodologies for Conducting Outcomes Assessment

### ***Reliability, Validity and Accuracy***

A reliable assessment tool provides data where the variance in the findings is primarily a result of the differences in the sample with respect to what is being measured, rather than bias or other knowledge or skill (Palomba & Banta, 1999). Clarity in the statements, adequate time to complete the instrument and good training for the assessors are vital components of achieving a reliable tool (Palomba & Banta, 1999).

Validity implies that the tool measures the desired characteristic. This is a critical attribute for an assessment tool. Essentially, validity represents the honesty of a tool (that the tool actually measures what it is designed to measure and that this is known; Palomba & Banta, 1999).

Accuracy describes whether a tool is a true measure of an outcome. Written tests may be measures related to a clinical skill. Often, however, the true measure of a clinical skill is a demonstration of that skill in an applied state, such as performing the skill on a patient.

Ideally, assessment instruments should provide evidence of their reliability, validity and accuracy. The NBEO examination provides data to support these factors in their reports. Many local instrument test packages also provide standard error of measurement data to assist in judging reliability, validity and accuracy. Unfortunately, many locally developed assessment tools must operate without substantial measures of these characteristics. Such tools should have face validity i.e., the tool is judged to be valid by an examination of its nature.

### ***Surveys***

Surveys are a common method to obtain perceptions about particular aspects of an institution, program or course. Generally, survey questions could consider some or all of the following attributes of a given aspect (Table 5). Frequently, surveys must be limited to only the most important questions for an outcomes assessment plan as a matter of practicality. It is important to remember that good outcome assessment plays a critical role in the ongoing management of a program.

Table 5. Common areas addressed by assessment survey questions

<b>AREAS FOR SURVEY QUESTIONS FOR ASSESSMENT PROGRAMS</b>
1. I am familiar with _____ for the School of Optometry.
2. The mission, goals and objectives for _____ of the School of Optometry are clear.
3. There is appropriate emphasis on the mission, goals and objectives for _____ of the School of Optometry.
4. I am satisfied with the mission, goals and objectives for _____ of the School of Optometry.
5. I support the mission, goals and objectives for _____ of the School of Optometry.
6. The School of Optometry is achieving its mission for _____.
7. Rate the achievement of the following goals and objectives for _____ of the School of Optometry.

### **Assessment Tools**

Examples of assessment tools include the following:

- Student Evaluation of Teaching/Curriculum (SET) surveys
- NBEO scores
- Alumni surveys (5 yrs, 10 yrs)
- Surveys of externship preceptors
- Instructor feedback survey
- Student exit interviews
- Self-reported alumni state board results
- Employer surveys
- Residency preceptor surveys
- Patient surveys
- Course Embedded Assessment (Individual course syllabi, exams and competency tests)

An assessment grid may be a useful method of tracking the objectives for each assessment tool. This grid has the assessment tools along one axis and the competencies or standards being assessed along the other. This can be a useful method assuring that all competencies are assessed.

Similarly, individual courses may find it helpful to make an outcome vs. course objectives grid. This may assist in tracking the methodology to assess each course objective. Individual course learning objectives should exist for each course to guide students in approaching the material that is being presented.

A good goal for a curriculum is to have coordinated syllabi. Coordinated syllabi may be useful in tracking curricular contents across courses. This provides the faculty and the curriculum committee a method to understand what is being taught and where. This process may also be helpful in educating faculty about the curriculum.

Selecting or developing an assessment tool should not be taken casually. Assessment tools should span the program and the eight-accreditation standards. Surveys are good methods of obtaining data and can be relatively inexpensive. Data collection should be undertaken for areas other than the curriculum on a judicious basis. The curriculum demands an ongoing, multi-factorial process. Unfortunately, there is few, if any,

commercially available assessment tools designed for professional optometric programs outside of NBEO and OAT examinations.

### **Assessment Programs**

Designing & implementing an outcome assessment plan is a substantial task and requires the support of the administration of the school or college. Certainly, the task should be assigned to someone or some group (e.g. the curriculum committee or an assessment committee). One of the important features of assessment is that to be effective, it must be ongoing and regular. Assessment must not be limited to accreditation self-studies.

Programs may find it useful to select a peer group of optometric institutions that have a similar mission. Within the overall group of optometry schools and colleges, there may be at least two natural peer groups, the public and the private schools and colleges. A peer group allows appropriate comparison of data. Comparing the total research budget of a large, public institution to the budget of a small private institution may be inappropriate and misleading.

Assessment programs have many limitations. Starting slowly and carefully is important in assessment. Keeping the program small and efficient is important, particularly initially. The individuals collecting the data should be constantly asking the receivers and users of the data, “Is this useful?” Or, “Does this information help in managing the program?” If the answers are not strongly “yes,” then the assessment effort should be revised. Managing a program or course or institution requires an immersion of the manager into the environment. When this occurs, assessment data provides data that substantiates impressions. The assessment data must be properly interpreted and, of course, most issues in academia are complex and challenge even bright, dedicated people.

Since assessment is an integral part of the strategic management of a program, good assessment requires the integration of the assessment into the program and its management.

### **Assessment of Standards for Accreditation for Professional Optometric Degree Programs 2009**

<http://www.aoa.org/optometrists/for-educators/accreditation-council-on-optometric-education/accreditation-resources-and-guidance>

### **In Summary**

Managing an educational program in Schools and Colleges of Optometry continues to be a challenging task. Fully utilizing the power and clarity provided by an effective assessment program can provide significant managerial assistance while at the same time providing confidence in the outcomes of the program; demonstrating evidence of success; and, illuminating opportunities for improvement. Assessment, like a good case history,

never is truly finished with each outcome and assessment giving light to better and better ways to achieve the mission of the program.

## References

Alverno College Faculty. Student Assessment as Learning at Alverno College. Alverno College Institute, Milwaukee, Wisconsin, 1994. 148 pp.

Alverno College Faculty. Ability-Based Learning Program Nursing Education. Alverno College Institute, Milwaukee, Wisconsin, 1999. 12 pp.

Alverno College Faculty. Ability-Based Learning Program. Alverno College Institute, Milwaukee, Wisconsin, 2000. 4 pp.

Anderson RS, Speck BW, eds. Changing the Way We Grade Student Performance: Classroom Assessment and the New Learning Paradigm. Jossey-Bass Publishers, San Francisco, Number 74, Summer 1998. 111 pp.

Angelo T, ed. Classroom Assessment and Research: An Update on Uses, Approaches and Research Findings. Jossey-Bass Publishers, San Francisco, Number 75, Fall 1998. 116 pp.

ACOE. Accreditation Manual: Professional Optometric Degree Program, revised January, 2010.

American Council on Optometric Education. Assessing Outcomes in Optometric Education, A commentary by the Council on Optometric Education. Optometric Education 23(2): 54-56, 1998.

American Council on Optometric Education. Accreditation Manual: Professional Optometric Degree Program Standards 2009. American Council on Optometric Education, St. Louis, MO.

Banta TW, ed. Making a Difference, Outcomes of a Decade of Assessment in Higher Education. Jossey-Bass Publishers, San Francisco, 1993. 388 pp.

Banta TW, Lund JP, Black KE, Oblander FW. Assessment in Practice, Putting Principles to Work on College Campuses. Jossey-Bass Publishers, San Francisco, 1996. 387 pp.

Beck DE, Daum KM. Integrating Outcomes Assessment into Optometry Education: A Strategic Guide for Enhancing Student Learning. Optometric Education 28(2): 64-71, 2003.

Gaither GH, ed. Assessing Performance in an Age of Accountability: Case Studies. Jossey-Bass Publishers, San Francisco, Number 91, Fall 1995. 107 pp.

Hagedorn LS, ed. What Contributes to Job Satisfaction Among Faculty and Staff? Jossey-Bass Publishers, San Francisco, Number 105, Spring 2000. 117 pp.

Heath DA, Daum KM, DiStefano AF, Haine CL, Schwartz SH. Students Graduating from Schools and Colleges of Optometry. An Association of Schools and Colleges of Optometry Report, 20 June 2000; in press, Journal of Optometric Education.

Hollenbeck RG, et al. Chair Report of the 1998-99 Academic Affairs Committee, American Association of Colleges of Pharmacy.

Loacker G, ed. Self Assessment at Alverno College. Alverno College Institute, Milwaukee, Wisconsin, 2000. 162 pp.

Loacker G, ed. Student Assessment as Learning at Alverno College. Alverno College Institute, Milwaukee, Wisconsin, 1985. 148 pp.

Loacker G, Cromwell L, Fey J, Rutherford D. Analysis and Communication at Alverno: An Approach to Critical Thinking. Alverno College Institute, Milwaukee, Wisconsin, 1984. 189 pp.

Malaney GD, ed. Student Affairs Research, Evaluation and Assessment: Structure and Practice in an Era of Change. Jossey-Bass Publishers, San Francisco, Number 85, Spring 1999. 100 pp.

Mentkowski M, ed. Learning that Lasts, Integrating Learning, Development and Performance in College and Beyond. Jossey-Bass Publishers, San Francisco, 2000. 536 pp.

Nichols JO. Implementing Institutional Effectiveness in Educational Programs to Meet Southern Association of Colleges and Schools' Accreditation Requirements. Presentation at Auburn University, August 29-30, 2000.

Palomba CA, Banta TW. Assessment Essentials, Planning, Implementing and Improving Assessment in Higher Education. Jossey-Bass Publishers, San Francisco, 1999. 405 pp.

Ratcliff, ed. Assessment and Curriculum Reform. Jossey-Bass Publishers, San Francisco, Number 80, Spring 1992. 108 pp.

Riordan T, ed. Valuing in Decision-making, Theory and Practice at Alverno College. Alverno College Institute, Milwaukee, Wisconsin, 1992. 18 pp.

Schuh JH, Upcraft ML. Assessment Practice in Student Affairs, An Applications Manual. Jossey-Bass Publishers, San Francisco, 2001. 510 pp.

Social Interaction Department. Teaching Social Interaction at Alverno College. Alverno College Institute, Milwaukee, Wisconsin, 1994. about 100 pp.

Sullins WD. Mission, Goals and Objectives, Memorandum, Council on Optometric Education, October 13, 1999.

Walvoord BE. Assessment Clear and Simple: A Practical Guide for Institutions, Departments, and General Education, 2<sup>nd</sup> Ed. Jossey-Bass Publishers, San Francisco, 2010.

### **Additional Resources**

Beck DE. Module 5: Assessment of Instructional Effectiveness. Health Professions Education Scholar, Teaching Excellence and Scholarship Development Resources for Health Professions Educators. <http://www.educationscholar.org/>

Palomba CA, Banta TW. Assessment Essentials, Planning Implementing and Improving Assessment in Higher Education. Jossey-Bass Publishers, San Francisco, 1999. 405 pp.

American Association for Higher Education. Catalog of Publications, 2000. AAHE, Washington DC. 13 pp.

American Association of Colleges of Pharmacy. Handbook on Outcomes Assessment. AACP, Alexandria, VA, 1995. 38 pp.

Council on Optometric Education. Assessing Outcomes in Optometric Education, A commentary by the Council on Optometric Education. Optometric Education 23(2): 54-56, 1998.

Daum KM, Berman MS, Boltz RL, Beck DE. Outcomes Assessment Survey of Schools and Colleges of Optometry. Optometric Education 28(2): 51-63, 2003.