

# *Western Carolina University*

## Handbook For Program Assessment

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Created by:  
Melissa Canady Wargo, Director  
Office of Assessment  
[wargo@wcu.edu](mailto:wargo@wcu.edu)  
828.227.3084

# **Handbook for Program Assessment**

## **Guidelines and Procedures for Development and Implementation**

The purpose of this handbook is to provide academic programs a resource for developing and implementing effective program assessment plans. The handbook provides an overview of the assessment process at Western Carolina University and basic reference materials for program faculty in developing meaningful and manageable missions, goals, learning outcomes, and assessment measures. Any feedback on this handbook and its contents is welcome and should be directed to the Office of Assessment at [assessment@wcu.edu](mailto:assessment@wcu.edu) or 828.227.3084.

# Table of Contents

Chapter 1: Introduction to Program Assessment	
Purpose of Program Assessment.....	2
Best Practices in Program Assessment .....	3
Common Language of Assessment.....	7
Additional References.....	9
Chapter 2: Assessment at Western Carolina University	
Role of the Office of Assessment .....	11
WCU Assessment Processes.....	13
Chapter 3: Preparing for Program Assessment	
Faculty Involvement .....	16
Creating effective processes .....	17
Additional Reference .....	18
Chapter 4: Mission and Goal Statements	
Formulating Mission/Purpose Statements .....	20
Defining Program Goals .....	22
Additional References.....	23
Chapter 5: Student Learning Outcomes	
Formulating Learning Outcomes .....	25
Domains of Learning .....	27
Action Verbs Associated with Domains of Learning .....	29
Additional References.....	31
Chapter 6: Assessment Methods	
Types of Measures .....	33
Developing and Using Rubrics .....	36
Developing and Using Surveys.....	37
Developing and Using Portfolios.....	39
Additional References.....	41
Appendices:	
Appendix A: Assessment Plan Template.....	43
Appendix B: Outcomes Delivery Matrix.....	45
Appendix C: Assessment Report Template .....	47
Appendix D: Assessment Plan Feedback Rubric.....	49
Appendix E: Assessment Report Feedback Rubric .....	52
Appendix F: Assessment Library Holdings.....	54

# Chapter 1

## Introduction to Program Assessment

## **Purpose of Program Assessment**

The purpose of program assessment is to **improve** programs or services. In an academic context, program assessment involves the continuous, systematic process of collecting and analyzing data and using that information to improve **student learning**. In other words, **what will graduates know, be able to do, or value** when they complete an academic program and **how do we know** these things about our students.

### *Benefits of a Systematic Program Assessment Process*

- Identify program strengths/weaknesses
- Inform financial decisions based on academic priorities
- Provide information to constituents on the quality of the education students receive
- Ensure continuous improvement of programs and curricula

### *What program assessment is NOT intended to be*

- An evaluation of individual students
- A tool for faculty evaluation
- Strategic planning
- Optional
- The job of one faculty member
- A meaningless bureaucratic exercise
- A waste of time

## Best Practices in Program Assessment

### *9 Principles of Good Practice for Assessing Student Learning*<sup>1</sup>

#### **1. The assessment of student learning begins with educational values**

Assessment is not an end in itself but a vehicle for educational improvement. Its effective practice, then, begins with and enacts a vision of the kinds of learning we most value for students and strive to help 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 is easy, rather than a process of improving what we really care about.

#### **2. Assessment is most effective when it reflects an understanding of learning as multidimensional, integrated, and revealed in performance over time.**

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 student's educational experience.

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<sup>1</sup> Alexander W. Astin; Trudy W. Banta; K. Patricia Cross; Elaine El-Khawas; Peter T. Ewell; Pat Hutchings; Theodore J. Marchese; Kay M. McClenney; Marcia Mentkowski; Margaret A. Miller; E. Thomas Moran; Barbara D. Wright.

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**3. Assessment works best when the programs it seeks to improve have clear, explicitly stated purposes.**

Assessment is a goal-oriented process. It entails comparing educational performance with educational purposes and expectations--these derived from the institution's mission, from faculty intentions in program and course design, and from knowledge of student's 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.

**4. Assessment requires attention to outcomes but also and equally to the experiences that lead to those outcomes.**

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.

**5. Assessment works best when it is ongoing, not episodic. Assessment is a process whose power is cumulative.**

Though isolated, "one-shot" assessment can be better than none, improvement over time is best fostered when assessment entails a linked series 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.

**6. Assessment fosters wider improvement when representatives from across the educational community are involved.**

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 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/ae, 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.

**7. Assessment makes a difference when it begins with issues of use and illuminates questions that people really care about.**

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.

**8. Assessment is most likely to lead to improvement when it is part of a larger set of conditions that promote change.**

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.



**9. Through assessment, educators meet responsibilities to students and to the public.**

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.

## Language of Assessment

Like many academic activities, the practice and scholarship of assessment has a terminology specific to its aims and shared by its practitioners. It is important that all involved in assessment activities have a common understanding of what different terms mean in an assessment context. Below is a list of terms and definitions that allows us to ‘speak the same language’ when discussing program assessment activities.

<u>Assessment Instrument:</u>	A tool designed to measure the extent to which an outcome has been achieved.
<u>Assessment Method:</u>	A systematically designed process to gather information related to a specified outcome.
<u>Direct Method:</u>	An assessment method designed to directly measure what a targeted subject knows or is able to do (i.e., requires a subject to actually demonstrate the skill or knowledge)
<u>Indirect Method:</u>	An assessment method that indirectly measures what a target subject knows or is able to do (i.e., what a subject perceives about his/her skills or knowledge)
<u>Assessment Plan:</u>	Document that outlines what will be assessed and how and when the assessment will occur. Assessment plans contain the program mission, goals, outcomes, outcomes delivery, and assessment methods.
<u>Assessment Report:</u>	Document that summarizes the results of assessments during a specified period and outlines what actions will be taken as a result of those assessments. An assessment report contains the outcomes assessed, a summary of assessment results, a summary of how the results were disseminated and the proposed improvements for the program or curriculum.

<u>Course/Experience/Activity:</u>	The curricular, co-curricular, or extra-curricular experience through which a student attains knowledge/skills outlined in the intended outcomes.
<u>Data:</u>	A series of facts or indicators that provide information about program services or curricula.
<u>Goals/Objectives:</u>	General, overarching statements about what a program hopes to accomplish.
<u>Matrix:</u>	A template within which assessment information can be framed and developed.
<u>Mission/Purpose:</u>	A brief, concise statement that articulates the purpose of the program.
<u>Outcome:</u>	<b>Measurable</b> statement of the desired output of a program
<u>Student Learning Outcome</u>	Statement of what students should know, think, or be able to do upon completion of the program
<u>Program/Process Outcome</u>	Statement of what a program intends to do, achieve, or accomplish through certain activities or experiences; i.e., what a program provides or accomplishes for its students, faculty/staff or institution.
<u>Rubric:</u>	A scoring guide used in assessment to provide an explicit description of the learning or performance being measured. A rubric defines the expected levels of learning or qualities of performance on a pre-determined rating scale.

## Additional References:

Banta, Trudy W., & Palomba, C. (1999). *Assessment Essentials*. San Francisco: Jossey-Bass.

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# Chapter 2

## Assessment at Western Carolina University

## **Role of the Office of Assessment**

### **Overview:**

The Office of Assessment at Western Carolina University was established in spring of 2006 as part of an overall campus commitment to continuous quality improvement of institutional programs and curricula. In an effort to expand the campus focus on assessment activities and to reinforce the importance of the assessment function as an academic priority the office was separated from University Planning and situated within the Office of the Provost and Vice Chancellor for Academic Affairs. Both offices, however, will continue to complement and support the other in promoting overall issues related to planning and institutional effectiveness. The Office of Assessment, specifically, will be responsible for providing support services to all campus units in their program assessment efforts.

Currently, the Office of Assessment consists of a director and an administrative assistant. In addition, the Office of Assessment staff will be supported by a planning and assessment analyst located in the Office of University Planning. This individual will be responsible for providing technical and analytical support related to campus assessment activities, as necessary. The director, Melissa Canady Wargo, has over twelve years of experience in institutional assessment, research, and planning. Most recently, she was Director of Assessment at Texas Christian University in Fort Worth, TX where she was responsible for the establishment of an institutional Office of Assessment. In that position, she provided oversight for all academic assessment activities, program review, and was a key staff person in the University's SACS reaffirmation process. Prior to TCU, Melissa was Coordinator of Assessment at the University of Texas at Arlington and Coordinator of Institutional Research and Assessment at Oklahoma State University in Oklahoma City. In her position as Director of Assessment here at Western Carolina University, Melissa will establish an accessible, client-based office whose key role will be to support to all campus units in their assessment efforts.

## **Office of Assessment Mission Statement:**

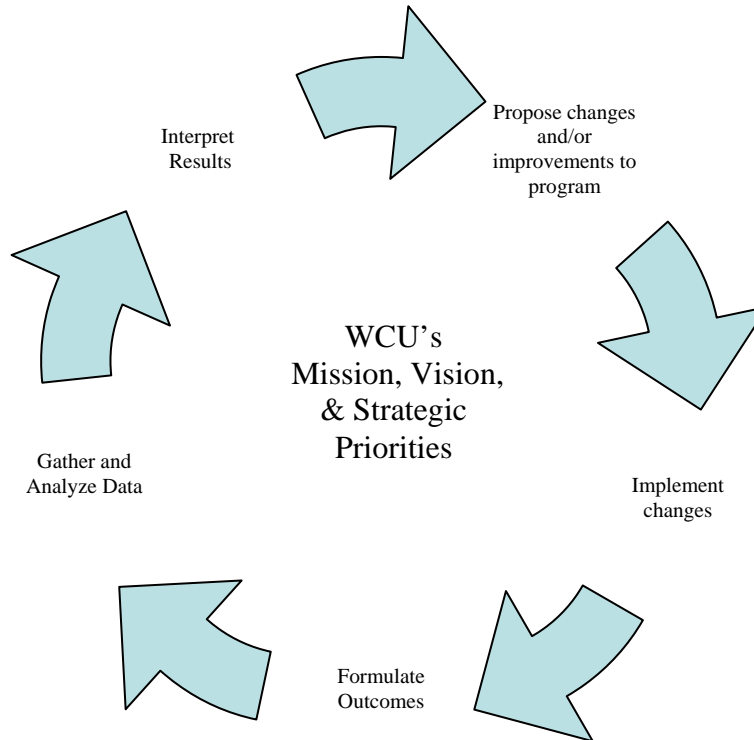
*The Office of Assessment at Western Carolina University serves to promote excellence in student learning, educational practices and quality of service by establishing and maintaining a campus culture of self evaluation and improvement all levels of the institution. The Office provides leadership and support to the campus community in efforts to demonstrate that the University is fulfilling its institutional mission and to enhance Western Carolina University as a community of scholarship.*

## **Primary Functions of the Office of Assessment:**

- To coordinate and support an ongoing, systematic program of institutional evaluation and assessment of student achievement, and facilitate the incorporation of the findings into the planning and accreditation processes;
- To work with academic and administrative programs to develop and implement outcomes assessment plans in order to improve programs and services at all institutional levels;
- To engage the campus community in a dialogue about assessment through a variety of avenues, including workshops, presentations, development and maintenance of an assessment website, and service on campus committees; and
- To publish assessment research and maintain an active role in professional organizations.

## WCU Assessment Processes

Program assessment at WCU is situated in an iterative 5-year cycle that is integrated with program review and other institutional processes related to planning and budgeting. This type of iterative cycle is graphically represented below.



At the beginning of the cycle, programs are required to produce a comprehensive program assessment plan (see Appendix A) that includes the following components:

- Program mission/purpose statement
- Articulation of how the program mission/purpose aligns with the college and institutional mission and vision
- Overarching program goals/objectives
- Intended student learning outcomes (and process/performance outcomes, if applicable).



- For each learning outcome, identification of courses/activities/experiences in the curriculum associated with outcome delivery. A separate template can be used (see Appendix B).
- For each learning outcome, articulation of intended method of assessment. Must include at least one direct measure of student learning. Departments will be strongly encouraged to utilize multiple measures, both direct and indirect, that incorporate evaluation of student work products, attitudes, behaviors, satisfaction and perceptions.

On an annual basis, programs are required to identify and assess at least one intended outcome. Although assessment of only one outcome per year will be required, all outcomes must be assessed prior to the program's scheduled program review. The annual assessment report (see Appendix C) will contain the following components:

- Intended outcome statement identified for assessment
- Summary of assessment methods/measures to include brief explanation of methodology, persons responsible for data collection and analysis, and a summary of assessment results.
- A description of the process used to disseminate assessment results to key stakeholders and summary of changes or improvements proposed based on assessment results.
- A brief description of the plan and timeline for implementing the proposed change(s) and any resources needed to implement the proposed change(s), using existing resources already in place, reallocating existing resources from other areas, or allocation of new funds.

Deans are required to collect all assessment plans and annual reports and provide initial feedback prior to submission to the Office of Assessment. Dean feedback is submitted to the Office of Assessment with all completed plans or reports. The Office of Assessment provides substantive feedback (see Appendix D and E) no later than 30 days after receipt of assessment plans or reports, requesting revisions as necessary. Office of Assessment also provides an annual report to the Office of the Provost summarizing institutional assessment activities and an evaluation of institutional assessment processes. For those programs undergoing program review, the Office of Assessment works with the program chair and the Associate Vice Chancellor for Academic Affairs to incorporate learning outcomes assessment as a key factor in the review document.

# Chapter 3

## Preparing for Program Assessment

## **Faculty Involvement**

Program assessment at its most effective requires the participation of ALL faculty and staff. It is recommended that each program appoint an assessment committee, designate an existing committee to assume the assessment responsibilities, or use the entire program faculty as a committee-of-the-whole. If a committee assumes the planning and assessment responsibilities, it should report the recommendations to the entire unit. There are two primary requirements to ensure that program assessment is effective, manageable, and meaningful.

1. A faculty commitment to initiate and support the process
2. A willingness by faculty to use assessment results for decision making and, ultimately, program improvement

The Office of Assessment works with program faculty to provide resources to assist with assessment efforts. The Assessment office provides consultation in developing outcome statements and assessment methods as well as facilitating the supply of information such as University statistics and survey research. The Office of Assessment also maintains an extensive assessment library available to the University community (see Appendix F). Publications on assessment are available in the Assessment Library located in H.F.R. Administration Bldg., Room 450.

## Creating Effective Processes

Planning for program assessment is imperative in order to ensure that the critical needs of the program are being met and that assessment activities provide meaningful data for the least cost in terms of faculty time/effort and program resources. Program assessment must incorporate the following inclusive processes in order to be effective and meaningful in the long term:

- A process for developing program goals and objectives
- A process for developing intended outcomes and assessment measures
- A process for implementation of the assessment measures (who, what, when, and where)
- A process for sharing assessment results and ensuring those data are incorporated in other programmatic activities such as planning and budgeting.

## Additional References:

Banta, Trudy W., & Palomba, C. (1999). *Assessment Essentials*. San Francisco: Jossey-Bass.

Banta, Trudy W. (2004). *Hallmarks of Effective Outcomes Assessment*. San Francisco: John Wiley and Sons.

Huba, Mary E. & Freed, Jann E. (2001). *Learner-Centered Assessment on College Campuses: Shifting the focus from teaching to learning*. Needham Heights, MA: Allyn Bacon Publishers.

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# Chapter 4

## Mission and Goal Statements

## Formulating Mission/Purpose Statements

### *Why do we need a mission/purpose statement?*

Mission/purpose statements are often derided as trite, coffee-cup slogans with little or no value in programmatic or curricular activities. This is a common misconception about the role of mission/purpose statements in the assessment process. Mission/purpose statements should be the guiding philosophy of ALL programmatic activities. Such statements, if thoughtfully developed, provide the foundation which supports all other aspects of program assessment.

Mission/purpose statements clarify the *raison d'être* of the program to all stakeholders (faculty, staff, students, alumni, employers, potential donors, etc.), allowing programs to focus their resources and efforts on issues that are critical to the mission.

### *What is a mission/purpose statement?*

All programs at WCU must have a clearly articulated mission/purpose statement. The mission/purpose statement must be a distinctive description of the program that identifies what the program is, what it does, and for whom it does it.

### *Characteristics of a Well-Defined Mission/Purpose Statement:*

- Brief, concise, distinctive
- Clearly identifies the program's purpose
- Clearly aligns with the mission of the school and/or college, and the University
- Explicitly articulates the essential functions/activities of the program
- Clearly identifies the primary stakeholders of the program; i.e., students, faculty, parents, etc.

### *General Format of Program Mission/Purpose Statement:*

“The mission (purpose) of the [insert name of program] is to [insert primary purpose] by providing [insert essential functions/activities of the program].”

***Examples of Well-Defined Program Mission/Purpose Statements:***

*“The mission of the civil engineering program is to prepare students for professional engineering and management positions in all phases of civil engineering projects. The program will provide a broad educational background with a foundation in basic engineering and business principles. These basic skills will be complemented by advanced topics in engineering design, management, finance, computer applications, and real world civil engineering experiences throughout the Baccalaureate Degree program.”* (Department of Civil Engineering, Western Kentucky University)

*“The MBA Program within the College of Business at James Madison University emphasizes excellence and continuous improvement in graduate learning by stressing knowledge, technical and interpersonal and experiential skills in the development of managerial decision making. The MBA Program seeks to serve part-time students who are full-time working professionals in the Shenandoah Valley and Piedmont Region of Virginia. The MBA Program also serves other professionals through contract programs utilizing on-site and distance learning methodologies.”* (MBA Program, James Madison University)

*“Our mission is to foster an intellectual community, based on critical inquiry, that explores the human condition while enabling students to develop the capacity to “think like an economist,” thereby providing the skills necessary for meaningful work, citizenship, and leadership.”* (Department of Economics, Texas Christian University)

*“The Department of Political Science offers strong major and minor programs sharing a focus on public concerns. We are committed to providing our students with the tools and competence to succeed in their lives, their graduate education and their careers by instilling academic rigor, information access and research skills, dedication to life-long learning and respect for diversity in cultures, nations and institutions of democracy.”* (Department of Political Science, James Madison University)



## Defining Program Goals

In a few brief, succinct statements state the overarching goals of the program, particularly as they relate to student learning. Program goals are generally broadly stated and focus on the long-term objectives of the program.

### *Characteristics of Well-Defined Program Goals*

- Clearly related to the program's mission/purpose
- Reflective of program priorities in the long-term
- Illustrate the 'ideal' graduate of the program
- Represent a consensus of faculty aspirations for the program
- Focus on the core characteristics of program graduates
- Widely disseminated to all program stakeholders

### *Writing Program Goals*

- Focus on a handful of goal statements; less than 5 is best
- Describe the actions of the program in facilitating the acquisition of certain skills, knowledge or attitudes of the ideal graduate
- Use a general format for the goal statement such as “to [insert action verb] [insert object] [insert modifiers]”

### *Examples of Program Goals*

“To adequately prepare students for success in graduate school”

“To provide a curriculum that allows students to attain the skills and knowledge necessary for success in their chosen career”

“To broaden the traditional disciplinary emphasis on graduate education to train students for non-academic careers”

“To foster an intellectual appreciation for the value of multiple perspectives in the study of past and present societies”

## Additional References:

Banta, Trudy W., & Palomba, C. (1999). *Assessment Essentials*. San Francisco: Jossey-Bass.

Banta, Trudy W. (2004). *Hallmarks of Effective Outcomes Assessment*. San Francisco: John Wiley and Sons.

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Walvoord, Barbara E. (2004). *Assessment Clear and Simple: A Practical Guide for Institutions, Departments, and General Education*. Jossey Bass, San Francisco: Jossey-Bass.

# Chapter 5

## Student Learning Outcomes

## Formulating Learning Outcomes

### *What is a student learning outcome (SLO)?*

A student learning outcome is a specific, measurable statement of **what a student should know, be able to do, or value** when they complete a program, course or sequence of courses/experiences/activities. All academic programs at WCU are required to include SLOs in their program assessment plans.

### *How is a SLO different from other types of program goals or objectives?*

A SLO focuses on **specific behaviors, attitudes, abilities**, etc. that a student will demonstrate or possess as a result of instruction or other programmatic activity. There may be other types of outcomes or objectives that a program might have that are not focused on student characteristics such as targets for faculty productivity in research and service, effectiveness of advising, community outreach, etc. These types of outcomes or objectives are known as **process or performance outcomes**. Programs are strongly encouraged to assess these types of outcomes, but they can not substitute for a SLO.

### *Characteristics of a Well-Defined Student Learning Outcome (think SMART<sup>2</sup>)*

- **Specific**; SLOs should be specific to your program and should be stated in clear, definitive terms.
- **Measurable**; SLOs must be stated in terms that are clearly measurable either quantitatively or qualitatively. The use of action verbs in SLO statements can maintain a focus on measurability. Sample action verbs can be found below. In addition, programs should consider whether data collection for a particular SLO is reasonable and feasible given program resources.
- **Attainable**; programs should consider the reality of what they hope to achieve. SLOs should be a reasonable statement of what the program can contribute in terms of student skills, knowledge and abilities. **Know your students and your program!**
- **Results-oriented**; SLOs should focus on the end result rather than an action to be implemented or provided by the program. SLOs should be clearly

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<sup>2</sup> Adapted from University of Central Florida Program Assessment Handbook (2004)

stated in terms of what exactly a student should know, be able to do, or value.

- **Time-bound**; SLOs should be framed in such a way that they can be measured within a time period over which the program has some control.

### *Anatomy of a Student Learning Outcome*

In a SLO statement the focus must be on the student and what s/he will know, do, or value. Possible formats of SLOs are as follows:

1. Students (graduates) will [insert action verb] [describe expected skill, knowledge or value].
2. Graduates (students) are able to [insert action verb] [describe expected skill, knowledge or value].
3. Students (graduates) will demonstrate the ability to (or knowledge of) [insert action verb] [describe expected skill, knowledge or value].

### *Examples of Student Learning Outcome Statements*

- Students will demonstrate the ability to organize and deliver a clear and substantive business presentation.
- Students will demonstrate the ability to formulate hypotheses, analyze data and draw conclusions.
- Graduates will be able to evaluate their own artistic skills and that of their peers through critical reasoning about the use of materials, formal elements, and content.
- Students will investigate basic social scientific concepts by systematically studying the observational and analytic methods and findings of social science disciplines.

## Domains of Learning

### *What types of skills/knowledge are appropriate for SLOs?*

The most effective way to develop specific learning outcomes is to use a taxonomy of learning domains. These types of matrices provide a standardized framework on which to structure your SLOs. By far, the most well-known and utilized of these taxonomies is Bloom's Taxonomy of Educational Objectives<sup>3</sup> which was first developed in 1956. Bloom's taxonomy recognizes three domains of educational objectives: cognitive, skills, and affective.

### *Cognitive Learning:*

<u>Cognitive Domain</u>	<u>Description</u>
Knowledge	Mastery of subject material; includes observation and recall of information; knowledge of dates, events, places; knowledge of major ideas
Comprehension	Ability to predict consequences and future trends; includes understanding information; grasp of meaning; translating knowledge into new contexts; interpreting, comparing and contrasting material; ordering, grouping and inferring causes
Application	Ability to solve problems using required knowledge/skills; includes using information material, methods, concepts, theories, etc. in new situations
Analysis	Ability to break down material and recognize structure of organization; includes seeing patterns; organization of parts, recognition of hidden meanings, identification of components
Synthesis	Ability to use old ideas to create new ones; includes generalizing from given facts, relating knowledge from several areas, predicting and drawing conclusions
Evaluation	Ability to judge and assess value of material; includes comparing and discriminating between ideas; assessing value of theories, presentations, etc., making choices based on reasoned argument; verifying value of evidence, recognizing subjectivity

<sup>3</sup> Bloom, B., Englehart, M., Furst, E., Hill, W., and Krathwohl, D. (1956). *Taxonomy of Educational Objectives: Cognitive Domain*. New York: David McKay.

***Affective Learning:***

<u>Affective Domain</u>	<u>Description</u>
Receiving	Awareness; willingness to participate
Responding	Actual participation in learning activity; demonstrates interest
Valuing	Attaching value or worth to object, person, activity, phenomenon
Organization	Prioritizing values; comparing and contrasting values to build new value system
Characterization by value	Modifies behavior based on new value system

***Skill-based Learning:***

<u>Skill Domain</u>	<u>Description</u>
Perception	Use of sensory organs to guide actions
Set	Readiness to act
Guided Response	Imitation; knowledge of steps required to complete task
Mechanism	Ability to repeat complex motor skill
Complex Overt Response	Display complex movement with skilled performance
Adaptation	Modifies motor skill to address changed situation
Origination	Creates new movement pattern in changed situations

## Action Verbs Associated with Types of Learning

It is helpful to use specific actions verbs associated with the various learning domains in the construction of meaningful learning outcomes. Use of these verbs helps to explicitly articulate what you expect a student to demonstrate in the course of learning outcomes assessment.

<b><u>Learning Domain</u></b>	<b><u>Examples of Action Verbs</u></b>
Knowledge	Articulate, describe, define, name, indicate, order, recognize, know, repeat, memorize, label, tabulate, quote, etc.
Comprehension	Discuss, explain, interpret, distinguish, suggest, summarize, understand, translate, classify, contrast, etc.
Application	Apply, investigate, experiment, solve, practice, predict, utilize, develop, illustrate, etc.
Analysis	Analyze, categorize, correlate, inform, infer, prioritize, criticize, differentiate, examine, interpret, etc.
Synthesis	Arrange, collect, compose, assemble, compile, create, design, formulate, organize, manage, propose, validate, etc.
Evaluation	Rate, conclude, appraise, evaluate, judge, defend, grade, assess, etc.
Receiving	Identify, select, choose, describe, etc.
Responding	Recite, discuss, present, answer, etc.
Valuing	Describe, explain, differentiate, join, share, etc.
Organization	Order, arrange, combine, integrate, synthesize, generalize, etc.
Characterization by Value	Qualify, practice, listen, influence, share, propose, etc.



<b><u>Learning Domain</u></b>	<b><u>Examples of Action Verbs</u></b>
Perception	Identify, detect, describe, isolate, etc.
Set	Respond, show, react, display, etc.
Guided Response	Construct, manipulate, assemble, etc.
Mechanism	Build, fix, organize, work, calibrate, etc.
Complex Overt Response	Manipulate, measure, mix, dismantle, etc.
Adaptation	Alter, revise, change, vary, etc.
Origination	Compose, construct, design, etc.

## Additional References:

Banta, Trudy W., & Palomba, C. (1999). *Assessment Essentials*. San Francisco: Jossey-Bass.

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# Chapter 6

## Assessment Methods

## Types of Assessment Methods

Programs should develop assessment methods that are appropriate to the outcome being assessed. Best practice is to utilize a variety of methods in order to expand the pool of information available for use in the decision-making process. Methods can be considered direct or indirect, quantitative or qualitative. **Assessment of SLOs must incorporate at least one direct measure of actual student work.** Below are some guidelines and examples of the types of assessment methods that can be used. Following that are some guidelines to developing and using rubrics, surveys, and portfolios.

### *Direct Measures of Student Learning*

Direct measures of student learning are those designed to directly measure what a targeted subject knows or is able to do (i.e., requires a subject to actually demonstrate the skill or knowledge). Direct measures of student learning utilize actual student work products as the basis for evaluation as opposed to indicators of student perception or satisfaction. Common direct measures include evaluation of:

- Capstone projects or exams
- Culminating experiences (e.g. internships, senior thesis, etc.)
- Juried review of student projects or performances
- Student work samples (e.g., case study responses, research papers, essay responses, etc.)
- Collection of student work samples (portfolios)
- Exit exams (standardized/proprietary exams or locally developed exams)
- Pre- and post-tests
- Performance on licensure or certification exams (must have access to subset or item analysis to be considered a direct measure, overall pass rates, while an important and informative indicator of program effectiveness, are insufficient in terms of learning outcomes assessment)

### *Indirect Measures of Student Learning*

Indirect measures of student learning are those designed to indirectly discern what a target subject knows or is able to do (i.e., what a subject perceives about his/her skills or knowledge). Indirect measures in the context of SLO assessment focus on how a student perceives their level of learning and/or their satisfaction with some aspect of the educational process. Some examples of indirect measures include:

- Surveys (student, alumni, etc.)
- Exit interviews
- Employment or Graduate School placement rates
- Retention/graduation data
- Demographics of student population
- Focus groups

## Developing and Using Rubrics in Outcomes Assessment

One of the most effective ways to evaluate student work products in learning outcomes assessment is to use a standardized rubric. A rubric is simply a scoring guide used in assessment to provide an explicit description of the learning or performance being measured. Some of the benefits of using rubrics in outcomes assessment include the following:

- Expected levels of learning or qualities of performance are clearly defined on a pre-determined rating scale.
- Allows program faculty to explicitly articulate their criteria for learning to all constituents.
- Facilitates discussion of the results and their ultimate incorporation into decision-making processes regarding programmatic or curricular changes.

### *Best Practices for Developing (see template below) and Using Rubrics in Outcomes Assessment*

- Identify the skill/knowledge you are assessing.
- Break down the skill/knowledge into its characteristic parts (e.g., if you are assessing the ability to problem solve determine the ideal steps a student would take to successfully demonstrate their ability to solve a problem).
- Develop a scale that would describe low, intermediate and high levels of performance for each characteristic of the skill/knowledge you are assessing (e.g., Beginning, Developing, Accomplished, Exemplary or Beginning, Competent, Outstanding, etc.).
- Pilot the rubric on student work with several reviewers and students and obtain feedback.
- Make assessment rubrics available to students before completion of assignments.
- Allow students to use rubrics in peer and self-assessment exercises.

- Develop process to aggregate results of assessments using standard rubrics; disseminate results to faculty and incorporate results into program decision making processes.

### Rubric Template<sup>4</sup>

(Describe here the skill/knowledge this rubric is designed to evaluate)

	Beginning 1	Developing 2	Accomplished 3	Exemplary 4	Score
Stated Objective or Performance	Description of identifiable performance characteristics reflecting a beginning level of performance.	Description of identifiable performance characteristics reflecting development and movement toward mastery of performance.	Description of identifiable performance characteristics reflecting mastery of performance.	Description of identifiable performance characteristics reflecting the highest level of performance.	
Stated Objective or Performance	Description of identifiable performance characteristics reflecting a beginning level of performance.	Description of identifiable performance characteristics reflecting development and movement toward mastery of performance.	Description of identifiable performance characteristics reflecting mastery of performance.	Description of identifiable performance characteristics reflecting the highest level of performance.	
Stated Objective or Performance	Description of identifiable performance characteristics reflecting a beginning level of performance.	Description of identifiable performance characteristics reflecting development and movement toward mastery of performance.	Description of identifiable performance characteristics reflecting mastery of performance.	Description of identifiable performance characteristics reflecting the highest level of performance.	

<sup>4</sup> This template was developed by the College of Education at San Diego State University available at [http://edweb.sdsu.edu/triton/july/rubrics/Rubric\\_Template.html](http://edweb.sdsu.edu/triton/july/rubrics/Rubric_Template.html).

## Developing and Using Surveys in Outcomes Assessment

Although not considered a direct measure of student learning, perception or satisfaction surveys are often employed in the assessment of learning outcomes. These types of instruments, if appropriately designed and administered, can provide a rich data set to inform programs about the effectiveness of their services and curriculum. Most instances of survey use in outcomes assessment, however, reflect more of a concern with convenience than with developing a tool to ascertain thoughtful student responses about their learning or their satisfaction with the educational process. Below are some tips and strategies for developing and using surveys in outcomes assessment.

### *Survey Development*

There are six primary elements of design programs should consider when developing a survey for assessment purposes:

1. Target population (e.g., current students, graduating seniors, alumni, employers, etc.)
2. Sampling (e.g., entire population, portion of population that is either randomly or selectively chosen, etc.)
3. Administration (e.g., paper-based, web-based, combination, etc.)
4. Instrument Design (e.g., what to include, type of response options/scale, etc.)
5. Analysis of Data (e.g., application used, who, when, etc.)
6. Management of Responses (e.g., use of results, dissemination of results, confidentiality, etc.)

### *Best Practices for Survey Use in Outcomes Assessment*

- Survey items should be explicitly derived from the program's learning goals and intended outcomes.
- Response scales should provoke students to thoughtfully reflect on the extent of their learning (e.g., avoid items that can be answered in a yes/no format).



- Responsibility for administration and tabulation of survey should be clearly defined and a timeline agreed upon in advance.
- Ensure that your survey instrument and methodology meet all University and IRB requirements for research protocol; for WCU requirements see Policy #51 at:  
<http://www.wcu.edu/chancellor/index/universitypolicy/policy51.html>

## Developing and Using Portfolios in Outcomes Assessment

A portfolio is a longitudinal collection of work samples that demonstrates the extent to which a student has fulfilled the intended SLO. The evaluation of student portfolios has become a commonly employed assessment tool in higher education. Portfolios have the advantage of compiling samples of student work in a convenient package which can then be evaluated using standardized criteria derived from program learning goals and outcomes. Moreover, portfolios have the added advantage of providing students a collection of materials that demonstrate their skills and knowledge to potential employers or graduate programs. Below are some general guidelines for developing and using portfolios in program assessment. Additional resources are included at the end of this chapter.

### *Characteristics of Portfolios Designed to Promote and Assess Student Learning*<sup>5</sup>

- Student involvement in the selection of entries
- Student preparation of written reflections about learning
- Continuing discussion with faculty regarding written reflections

### *Best Practices for Use of Portfolios in Program Assessment*

- Carefully select what you choose to require in a portfolio; be sure that included materials can be used to assess the intended outcomes.
- Communicate clearly to students what you expect to see in the portfolio in terms of work products and specify the format(s) that are acceptable (e.g., paper, electronic, etc.).
- Develop a standard rubric to use in evaluation of the portfolios and have at least two reviewers for each portfolio.
- Clearly articulate the methodology of collecting and evaluating the portfolios. Address questions of when the portfolio is due, what the consequences are for failing to provide a portfolio, is the portfolio retained

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<sup>5</sup> Palomba, Catherine and Banta, Trudy W. *Assessment Essentials: Planning, Implementing, and Improving Assessment in Higher Education*. Jossey-Bass Publishers San Francisco: 1999.

in the program office or returned to the student, and whether the evaluation is for program assessment purposes only or will it be used as part of a course grade or a graduation requirement.

- Develop a process for communicating the results of the assessment to the program faculty.

## **Additional Resources on Developing and Using Rubrics, Surveys and Portfolios in Learning Outcomes Assessment**

Banta, Trudy W. (Ed.). (2003). *Portfolio Assessment Uses, Cases, Scoring, and Impact: Assessment Update collections*. San Francisco: Jossey-Bass.

Biemer, Paul P. & Lyberg, Lars E. (2003). *Introduction to Survey Quality*. San Francisco: Jossey-Bass.

*Developing Rubrics*. (2003, September 5). Retrieved on March 10, 2006 from Pennsylvania State University Office of Teaching and Learning with Technology website: [http://tlt.psu.edu/suggestions/research/Measure\\_dev.shtml](http://tlt.psu.edu/suggestions/research/Measure_dev.shtml).

Groves, Robert M., Fowler, Floyd J., Couper, Mick P., Lepkowski, James M., Singer, Eleanor, & Tourangeau, Roger. (2004). *Survey Methodology*. San Francisco: Jossey-Bass.

*Guidelines to Rubric Development*. (1999, March 31). Retrieved on March 10, 2006 from San Diego State University College of Education website: [http://edweb.sdsu.edu/triton/july/rubrics/Rubric\\_Guidelines.html](http://edweb.sdsu.edu/triton/july/rubrics/Rubric_Guidelines.html).

Mertler, Craig A. (2001). Designing scoring rubrics for your classroom. *Practical Assessment, Research & Evaluation*, 7(25).

Michelson, E., Mandell, A., et al. (2004). *Portfolio Development and the Assessment of Prior Learning*. Sterling, VA: Stylus Publishing LLC.

Moskal, Barbara M. (2000). *Scoring rubrics: what, when and how?* *Practical Assessment, Research & Evaluation*, 7(3).

Rea, Louis M. & Parker, Richard A. (2005). *Designing and Conducting Survey Research: A comprehensive guide*. San Francisco: Jossey-Bass.

Stevens, Dannelle D. & Levi, Antonia J. (2004). *Introduction To Rubrics: An assessment tool to save grading time, convey effective feedback and promote student learning*. Sterling, VA: Stylus Publishing.

# Appendix A

## Assessment Plan Template

**Western Carolina University**  
**Program Assessment Plan**  
 (Program Name)  
 (College Name)  
 Assessment Plan for 200\_ - 20\_\_

**Primary Contact Name/Info:**

Provide name and contact info for person responsible for submitting program assessment plan.

**Department Mission Statement:**

Brief, concise statement of the department's purpose

**Statement on Alignment of Program Mission w/ University and College Mission:**

Briefly articulate how the program's purpose aligns with the mission and strategic vision of the University and College.

**Program Goals/Objectives:**

Several brief statements of the core skills and/or knowledge that students will have upon completion of the program.

Intended Learning Outcome	Curricular and/or Co-Curricular Experiences	Method(s) of Assessment
<p>What will students know or be able to do upon completion of the program?</p> <p><i>Measurable</i> statement of the desired output or what students should know, think, or be able to do upon completion of the program.</p>	<p>Where will students acquire the skills and/or knowledge identified in the outcome?</p> <p>Course(s) and/or experience(s) through which students will acquire the skills and/or knowledge identified in the outcome and what level of learning students are expected to attain, i.e., basic, intermediate, or advanced.</p> <p>If desired, use attached Outcome Delivery Matrix Template.</p>	<p>How will you determine that the students know or can do what you expect?</p> <p>Methods of assessment must address the outcome directly and identify who will be responsible for implementing the assessment measure, what data will be collected, and when the data will be collected and analyzed.</p>

**Due May 31, 2006**

# Appendix B

## Outcomes Delivery Matrix

Western Carolina University  
 Template for Outcome Delivery Matrix\*

Intended Outcome	Course/Experience/Activity	Course/Experience/Activity	Course/Experience/Activity	Course/Experience/Activity

\*Adapted from Bresciani, M.J., 2003, Identifying Projects that Deliver Outcomes and Provide a Means of Assessment: A Concept Mapping Checklist, NASPA NetRESULTS.



# Appendix C

## Assessment Report Template

*Western Carolina University*  
 (Program Name)  
 (College Name)  
 Annual Assessment Report for 200\_-200\_

**Primary Contact Name/Info:**

Provide name and contact info for person responsible for submitting program assessment plan.

Intended Learning Outcome to be Assessed this Cycle	Method(s) of Assessment	Results of Assessment	Implementation Plan
State the outcome(s) that the program has chosen to assess this annual cycle.	Provide a summary of the methods of assessment used to assess the chosen outcome. Note any changes in the assessment measures from the program's official assessment plan.	Results must include a summary of major findings, interpretation of the results, and a description of how the results were disseminated to key stakeholders for discussion.	Identify what programmatic or curricular changes, if any, you will make as a result of the assessment results.  Each recommended action must be specific and relate directly to the outcome and results of assessment. A description of the timeline for action and the person(s) responsible must be included. In addition, please include a brief description of resources that will be critical to implementation of the actions proposed, if applicable.

**Due Annually by May 31st**

# Appendix D

## Assessment Plan Feedback Rubric

**Western Carolina University**  
**Program Assessment Plan Feedback Rubric**  
**Plan Years 20\_\_ - 2\_\_**

<b>Assessment Plan Contents</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the plan contain primary contact person and information?			
2. Does the plan clearly indicate the name of the program, the college to which it reports, and the years covered by the plan?			
3. Does the plan provide a concise mission/purpose statement for the program?			
4. Does the plan provide a brief statement of how the program mission aligns with the college and university mission?			
5. Does the plan list the primary program goals/objectives?			
6. Does the plan contain at least 5-7 intended student learning outcomes?			
7. Does the plan provide an outcome delivery narrative or matrix for each outcome statement?			
8. Does the plan contain a summary of the assessment method(s) for each outcome statement?			

<b>Substantive Feedback on Plan Contents:</b>	<b>Comments:</b>
<i>Program Mission Statement:</i>	
1. Is the mission statement clearly written and appropriate for the program?	
2. Is the mission statement reflective of the institutional values/priorities outlined in the college and institutional missions?	
3. Is the statement of alignment between program mission and college/university mission clearly articulated and convincing?	
<i>Program Goals/Objectives:</i>	
1. Does the plan articulate several overarching goals/objectives for the program?	
2. Are those goals/objectives reflective of the program's mission/purpose?	

**Western Carolina University**  
**Program Assessment Plan Feedback Rubric**  
**Plan Years 20\_\_ - 2\_\_**

<b><u>Substantive Feedback on Plan Contents:</u></b>	<b><u>Comments:</u></b>
<i>Each Intended Outcome Statements:</i>	
1. Is the outcome specific, detailed, and, most importantly, stated in measurable terms using appropriate action verbs?	
2. If a learning outcome, does the outcome clearly state what a student should know or be able to do?	
3. If a process/program outcome, does the outcome clearly articulate the intended result or action?	
4. Is the outcome clearly reflective of the program's overarching goals/objectives?	
5. Is the outcome within the capability of the unit to achieve without significant participation at a broader level?	
<i>Assessment Methods:</i>	
1. Does the assessment method(s) emphasize the use of a variety of measures (e.g., quantitative, qualitative, direct, indirect, etc.)?	
2. If tied to a learning outcome, does the method include at least one direct measure of student learning?	
3. Is the method(s) accurately designed for the intended outcome (i.e., will it measure what it is meant to measure)?	
4. Is the "who, what and when" clearly specified for each assessment method? That is, can you tell what data will be collected, from what sources, using what methods, by whom, in what approximate timeframe?	
5. Are the proposed assessments likely to yield relevant information that can be used to make curricular or programmatic changes?	

# Appendix E

## Assessment Report Feedback Rubric

**Western Carolina University**  
**Annual Assessment Report Feedback Rubric**  
**Years 20\_\_ - 20\_\_**

<b>Report Contents:</b>	<b>Yes</b>	<b>No</b>	<b>N/A</b>
1. Does the report contain primary contact person and information?			
2. Does the report clearly indicate the name of the program, the college to which it reports, and the year covered by the report?			
3. Does the report contain a summary of the assessment method(s) for the outcome assessed?			
4. Does the report contain a summary of the assessment results?			
5. Does the report identify the group(s) who participated in the discussion of the assessment results and proposed changes?			
6. Does the report provide specific recommendations for changes or improvements based on the assessment results?			
7. Does the report specify who will be responsible for implementing the proposed change(s)?			
8. Does the report identify the resources needed to implement the proposed change(s)?			

<b>Substantive Feedback on Report Contents:</b>	<b>Comments:</b>
<i>Assessment Methods/Results:</i>	
1. Does the summary indicate any modifications from the method(s) outlined in the Program Assessment Plan?	
2. Does the summary clearly identify the persons responsible and the procedures employed for data collection and analysis?	
3. Does the summary provide specific details of the results of assessment?	
4. Does the summary identify the extent to which the outcome was achieved?	
5. Does the summary provide a description of the process used to disseminate the results and with whom they were shared?	

**Western Carolina University**  
**Annual Assessment Report Feedback Rubric**  
**Years 20\_\_ - 20\_\_**

<b><u>Substantive Feedback on Report Contents:</u></b>	<b><u>Comments:</u></b>
<i>Proposed Changes or Improvements:</i>	
1. Does the report specifically detail the changes or recommendations proposed in response to the assessment results?	
2. Does the report identify who will be responsible for implementing the proposed change(s)?	
3. Does the report provide a timeline for implementation of the proposed change(s)?	
3. Does the report summarize the assistance needed, if applicable, from other campus divisions to implement the proposed change(s)?	
4. Does the report identify any resources needed to implement the proposed change(s) and from what source those resources might come (i.e., existing resources, reallocation of existing resources, or allocation of new funds)? Are the resources identified directly tied to implementation of the proposed change(s)?	
5. Does the report include a timeline for reevaluation of the outcome assessed?	



# Appendix F

## Assessment Library Holdings

## Assessment Library

Anderson, R., & Speck, B. (Eds.). (1998). *New Direction for Reaching and Learning: Changing the Way We Grade Student Performance: Classroom Assessment and the New Learning Paradigm*. San Francisco, CA: Jossey-Bass.

Angelo, T., (Ed.). (1998). *Classroom Assessment and Research: An Update on Uses, Approaches, and Research Findings*. San Francisco, CA: Jossey-Bass.

Angelo, T., & Cross, P. (1993). *Classroom Assessment Techniques: A Handbook for College Teachers* (2<sup>nd</sup> ed.). San Francisco, CA: Jossey-Bass.

Astin, A. (1993). *What Matters in College?* San Francisco, CA: Jossey-Bass.

Banta, T., & Associates (2002). *Building a Scholarship of Assessment*. San Francisco, CA: Jossey-Bass.

Banta, T. (Ed.). (2004). *Hallmarks of Effective Outcomes Assessment*. San Francisco, CA: Jossey-Bass.

Banta, T., Lund, J., Black, K. & Oblander, F. (1996). *Assessment in Practice: Putting Principles to Work on College Campuses*. San Francisco, CA: Jossey-Bass.

Bender, B., & Schuh, J. (2002). *Using Benchmarking to Inform Practice in Higher Education*. San Francisco, CA: Jossey-Bass.

Braskamp, L., & Ory, J. (1994). *Assessing Faculty Work: Enhancing Individual and Institutional Performance*. San Francisco, CA: Jossey-Bass.

Cambridge, B. (2001). *Electronic Portfolios: Emerging Practices in Student, Faculty, and Institutional Learning*. Sterling, VA: AAHE.

Dalton, J., Russell, T., & Kline, S. (Eds.). (2004). *New Directions for Institutional Research: Assessing Character Outcomes in College* (No. 122). San Francisco, CA: Jossey-Bass.

Diamond, R.. (1998). *Designing & Assessment Courses & Curricula: A Practical Guide*, (2<sup>nd</sup> ed.). San Francisco, CA: Jossey-Bass.

Grant, J. (Ed.). (1996). *Assessing Graduate and Professional Education: Current Realities, Future Prospects* (No. 92). San Francisco, CA: Jossey-Bass.

Haswell, R. (Ed.). (2001). *Beyond Outcomes: Assessment and Instruction within a University Writing Program* (Vol. 5). Westport, CT: Ablex Publishing.

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Howard, R., & Borland, K. (Eds.). (2001). *New Directions for Institutional Research: Balancing Qualitative and Quantitative Information for Effective Decision Support* (No. 112). San Francisco, CA: Jossey-Bass.

Huba, M., & Freed, J. (2000). *Learner-Centered Assessment on College Campuses: Shifting the Focus from Teaching to Learning*. Needham Heights, MA: Allyn and Bacon.

Kezar, A., Hirsch, D., & Burack, C. (Eds.). (2002). *Understanding the Role of Academic and Student Affairs Collaboration in Creating a Successful Learning Environment* (No. 116). San Francisco, CA: Jossey-Bass.

Knox, A. (2002). *Evaluation for Continuing Education: A Comprehensive Guide to Success*. San Francisco, CA: Jossey-Bass.

Kuh, G. Kinzie, J., Schuh, J., & Whitt, E. (2005). *Assessing Conditions to Enhance Educational Effectiveness: The Inventory for Student Engagement and Success*. San Francisco, CA: Jossey-Bass.

Kuh, G. Kinzie, J., Schuh, J., Whitt, E. & Associates (2005). *Student Success in College: Creating Conditions that Matter*. San Francisco, CA: Jossey-Bass.

Leigh, B. MacGregor, J., Matthews, R., & Gabelnick, F., (2004). *Learning Communities: Performing Undergraduate Education*. San Francisco, CA: Jossey-Bass.

Light, R. (2001). *Making the Most in College: Students Speak their Minds*. Cambridge, MA & London, England: Harvard University Press.

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Michelson, E., Mandell, A., et al. (2004). *Portfolio Development and the Assessment of Prior Learning*. Sterling, VA: Stylus Publishing LLC.

Merriam, S & Associates (2002). *Qualitative Research in Practice: Examples for Discussion and Analysis*. San Francisco, CA: Jossey-Bass.

Narum, J., & Conover, K. (Eds.). (2002). *New Directions for Higher Education: Building Robust Learning Environments in Undergraduate Science, Technology, Engineering, and Mathematics*. (No. 119). San Francisco, CA: Jossey-Bass.

Palomba, C., & Banta, T. (1999). *Assessment Essentials: Planning Implementing and Improving Assessment in Higher Education*. San Francisco, CA: Jossey-Bass.

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Ratcliff, J., Lubinescu, E., & Gaffney, M. (Eds.,) (2001). *New Collection for Higher Education: How Accreditation Influences Assessment, (No. 113)*. San Francisco, CA: Jossey-Bass.

Riordan, T., & Roth, J. (Eds.,) (2005). *Disciplines as Frameworks for Student Learning: Teaching the Practice of the Disciplines*. Sterling, VA: Stylus Publishing LLC.

Schuh, J., Lee, M., & Associates (2001). *Assessment Practice in Student Affairs: An Applications Manual*. San Francisco, CA: Jossey-Bass.

Schwartz, P., & Webb, G. (2002). *Assessment: Case Studies, Experience and Practice for Higher Education*. Sterling, VA: Stylus Publishing Inc.

Sedlacek, W. (2004). *Beyond the Big Test*. San Francisco, CA: Jossey-Bass.

Serban, A., & Friedlander, J. (Eds.,) (2004). *Developing and Implementing Assessment of Student Learning Outcomes*. San Francisco, CA: Jossey-Bass.

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Theall, M., Abrami, P., & Mets, L. (2001). *New Directions for Institutional Research: The Student Ratings Debate: Are They Valid? How Can We Best Use Them? (No. 109)*. San Francisco, CA: Jossey-Bass.

Voorhees, R. (Ed) (2001). *New Directions for Institutional Research: Measuring What Matters Competency-Based Learning Models in Higher Education. (No. 110)*. San Francisco, CA: Jossey-Bass.

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