PROGRAM ASSESSMENT HANDBOOK

GUIDELINES FOR PLANNING AND IMPLEMENTING

QUALITY
ENHANCING
EFFORTS

OF PROGRAM AND STUDENT LEARNING OUTCOMES

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The purpose of this handbook is to provide academic programs with a framework for developing an assessment plan with the objective of improving an academic program. In Chapter 1, an overview of assessment and more specifically program assessment is introduced. Guidelines and suggestions for planning for program assessment are provided in Chapter 2. Methods that can be used to assist the department in developing its mission and program goals statements are included in Chapter 3. Chapter 4 is describes the development of student learning outcomes and includes a checklist and a preparation form to aid those involved in the assessment process. An inventory of program assessment tools, methods and techniques is outlined in Chapter 5. Chapter 6 provides an overview of documenting and using data from assessment.

We would like to acknowledge the work of colleagues at other institutions (referenced throughout the handbook).

MOST COMMON MISCONCEPTIONS ABOUT PROGRAM ASSESSMENT

Misconception 1: The results of assessment will be used to evaluate faculty performance.

Nothing could be further from the truth. Faculty awareness, participation, and ownership are essential for successful program assessment, but assessment results should never be used to evaluate or judge individual faculty performance. The results of program assessment are used to improve programs.

Misconception 2: Our program is working well, our students are learning; we don't need to bother with assessment.

The primary purpose of program assessment is to improve the quality of educational programs by improving student learning. Even if you feel that the quality of your program is good, there is always room for improvement. In addition, various accrediting bodies mandate conducting student outcomes assessment. For example, the Southern Association of Colleges and Schools (SACS) requires that every program assess its student outcomes and uses the results to improve programs. Not to conduct assessment is not an option.

Misconception 3: We will assign a single faculty member to conduct the assessment. Too many opinions would only delay and hinder the process.

While it is a good idea to have one or two faculty members head the assessment process for the department, it is really important and beneficial to have all faculty members involved. Each person brings to the table different perspectives and ideas for improving the academic program. Also it is important that all faculty members understand and agree to the mission (i.e., purpose) and goals of the academic program.

Misconception 4: The administration might use the results to eliminate some of the department's programs.

There are two types of evaluation processes: summative and formative. The purpose of summative program evaluation is to judge the quality and worth of a program. On the other hand, the purpose of formative program evaluation is to provide feedback to help improve and modify a program. Program assessment is intended as a formative evaluation and not a summative evaluation. The results of program assessment will not be used to eliminate programs.

Misconception 5: Assessment is a waste of time and does not benefit the students.

The primary purpose of assessment is to identify the important objectives and learning outcomes for your program with the purpose of improving student learning. Anything that enhances and improves the learning, knowledge and growth of your students cannot be considered a waste of time.

Misconception 6: We will come up with an assessment plan for this year and use it every year thereafter.

For program assessment to be successful, it must be an ongoing and continuous process. Just as your program should be improving, so should your assessment plan and measurement methods. Each academic department must look at its programs and its learning outcomes on a continual basis and determine if there are better ways to measure student learning and other program outcomes. Your assessment plan should be continuously reviewed and improved.

Misconception 7: Program assessment sounds like a good idea, but it is time-consuming and complex.

It is impossible to "get something for nothing." Effective program assessment will take some of your time and effort, but there are steps that you can follow that can help you to develop an assessment plan that will lead to improving student learning. Also, the office of Operational Excellence and Assessment Support (OEAS) is available to provide you with assistance. If you need any help go to http://oeas.ucf.edu, the Operational Excellence and Assessment Support website for guidelines and assistance in conducting program assessment or contact the office (407-882-0277) to make an appointment for a consultation.

HANDBOOK CONTENTS

What is assessment and why should you assess?
Chapter 1 provides an overview of the assessment process at UCF and defines the concept of program assessment. Also, this chapter introduces the purposes and characteristics of assessment to help you when you are thinking about how assessment can benefit your program.

How should you plan for program assessment?
Chapter 2 provides guidelines and suggestions for developing a plan for program assessment. Designing an assessment plan is not an easy task. The objectives of this chapter are to introduce the steps involved in designing an assessment plan and provide suggestions to help you tailor the plan to match the learning outcomes of your program.

How do you define program mission and goals?
Chapter 3 provides several strategies to assist in defining the program's mission and identifying program goals. Understanding and clearly stating what your program is trying to accomplish serve as a foundation for a successful assessment plan. It is important to define and obtain a consensus on program goals. There are some guidelines that your program can follow to help you do this.

How do you define student learning outcomes?
Chapter 4 provides an overview and definition of program objectives (student learning outcomes) and stresses the importance of explicitly defining expectations and standards. Also included is an extensive discussion on how to write clear and precise statements of outcomes for your program. This is an integral part of an assessment plan and your department should focus on defining clear statements of program level student learning outcomes.

How do you select and develop assessment methods?
Chapter 5 presents a discussion on guidelines and criteria for selecting the appropriate assessment methods for each student learning outcome. Additionally, an inventory of assessment methods and techniques that are currently available or can be developed or adapted to your program is presented.

How do you document and use the results to improve programs?
Chapter 6 provides an overview of how to document the results and use the results to improve your program. Documentation is necessary in order to communicate with others, including accreditation agencies, how well your students are learning. Reviewing the data on student performance can point to areas in your program that require strengthening.

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CHAPTER 1
OVERVIEW OF ASSESSMENT

Purpose of this Chapter

The purpose of this chapter is to provide an overview of the assessment process at UCF and to define the concept of program assessment. Also, this chapter introduces you the purposes of assessment and characteristics of a good assessment process to help you when you are thinking about how assessment can benefit your program.

KEY TOPICS	**The key topics presented in this Chapter are:** ▪ Chapter learning outcomes ▪ Background on assessment at UCF ▪ Introduction to program assessment ▪ Purposes of program assessment ▪ Characteristics of effective program assessment ▪ Nine principles of assessment ▪ Sources and additional references

Chapter learning outcomes

Readers of this chapter will have the ability to:

- understand the assessment process at UCF
- differentiate between different types of assessment (classroom, course, program and institutional)
- identify the purposes of engaging in program assessment
- establish that assessment is not a means of evaluating, faculty, staff or students, rather it is a feedback mechanism
- recognize that program assessment is intended to identify ways of improving student learning
- comprehend that assessment has to be systematic and ongoing
- understand that effective program assessment is achieved by examining what are we doing, how well we are doing it and how can we improve what we are doing

Background on assessment at UCF

Institutions of higher learning are becoming increasingly involved in conducting assessment within their academic programs and administrative support organizations. The desire to know how well the institution and its programs are doing and to improve service and student learning are all motivators for conducting assessment.

Institutions are facing internal and external pressures to increase quality even while funding resources are reduced. Increasingly, various organizations that accredit academic programs (e.g., NCATE, ABET, and AACSB) are requiring that institutions assess how well the programs are meeting their objectives to inform improvement efforts. The State of Florida is increasingly holding its institutions accountable for achieving student learning outcomes. The ability for institutions in the South to offer student financial aid (from federal sources) depends on their ability to remain accredited by the Southern Association of Colleges and Schools (SACS). In part, this requires that the institution demonstrates that it has an active assessment process that continuously examines the services and programs and leads to improvement. According to SACS: "The institution identifies expected outcomes for its educational programs and its administrative and educational support services; assesses whether it achieves these outcomes; and provides evidence of improvement based on analysis of those results." UCF's strategic goals and initiatives demand a focus on operational excellence and continuous quality improvement. A commitment to continuous quality improvement requires a shared devotion to quality that surpasses other personal and short-term concerns.

In 1994, the University of Central Florida (UCF) established a goal that all academic and administrative units would develop mission statements, learning outcomes, and at least three outcome measures to assess and improve programs, operations, and services. Today, every academic program and administrative unit at UCF is required to submit in the Fall an assessment plan for the coming year and document the results of their prior assessment. These plans and results are reviewed by Divisional Review Committees within each college and major administrative area, and then presented to the University Assessment Committee for final approval. President Hitt established the University Assessment Committee in 1996 to provide quality assurance of UCF's program assessment process. In 2000, the office of Operational Excellence and Assessment Support was established, in part, to provide support to UCF's program assessment process.

Introduction to program assessment

Definition

Assessment is the systematic and ongoing method of gathering, analyzing and using information from measured outcomes to improve student learning.

In higher education the term "assessment" can mean a variety of things. It can refer to the process of grading an individual student's achievement on a test or assignment or it can refer to the process of evaluating the quality of an academic program. The overall purpose of **program assessment** does not focus on an individual student. Rather, the

emphasis is on what and how an educational **program** is **contributing** to the learning, growth and development of **students as a group**.
There are four levels of assessment: 1. classroom assessment (involves assessment of individual students at the course level typically by the class instructor), 2. course assessment (involves assessment of a specific course), 3. **program assessment** (involves assessment of academic and support programs and is the focus of this manual), and 4. institutional assessment (involves assessment of campus-wide characteristics and issues).

(Adapted from Palomba and Banta, 1999; and Stassen, Doherty, and Poe, 2001)

Of Note

This manual focuses on program-level assessment.

Program assessment is defined as the **systematic and ongoing** method of **gathering, analyzing and using information** from various sources about a program and measuring program outcomes in order **to improve student learning.** This is done through obtaining a good understanding of what the program's graduates know, what they can do with this knowledge, and what they value as a result of this knowledge. Program assessment, as it is addressed in this manual, can also be called **student outcomes assessment,** which places an emphasis on the learning, development and growth of students.

(Adapted from definitions by Huba and Freed, 2000; Hutchings and Marchese, 1990; and Palomba and Banta, 1999)

Of Note

Program assessment should not be an evaluation of individual students, faculty or staff. It is a process used to provide a program with feedback on its performance with the intent of helping improve the program and in particular, improve student learning.

Purposes of program assessment

The four main purposes of program assessment are:

1. **To improve –** the assessment process should provide feedback to determine how the program can be improved.
2. **To inform –** the assessment process should inform faculty and other decision-makers of the contributions and impact of the program.
3. **To prove –** the assessment process should encapsulate and demonstrate to students, faculty, staff and outsiders what the program is accomplishing.

(Adapted from Outcomes Assessment Manual, 2000; and WEAVE: A Quality Enhancement Guide, 2000)

4. **To support –** the assessment process should provide support for campus decision-making activities such as program review and strategic planning, as well as external accountability activities such as accreditation.

Of Note

When developing the assessment plan for your program, always refer back to the four main purposes of assessment: improve, inform, prove, and support.

Characteristics of effective program assessment

Effective program assessment should answer these questions:

1. **What are you trying to do?**
2. **How well are you doing it?**
3. **Using the answers to the first two questions, how can you improve what you are doing?**
4. **What and how does a program contribute to the development and growth of its students?**
5. **How can student learning be improved?**

(Adapted from Hutchings and Marchese, 1990)

Of Note

The assessment process of your program should try to address these questions. Remember to refer to them while you are conducting your assessment activities.

Additionally, **program assessment is effective** when:

1. Assessment is viewed as a **comprehensive**, **systematic** and **continuous** process.
2. Assessment is viewed as a **means for self-improvement**.
3. Assessment **measures** are **meaningful**.
4. Assessment utilizes **multiple measures** and **multiple sources**.
5. Assessment is used as a **management tool**.
6. Assessment **results** are **valued** and are genuinely **used to improve** programs and processes.
7. Assessment is **coordinated** by **one person** and reviewed by a committee.
8. Assessment involves the **participation and input of all faculty and staff**.
9. Assessment **includes students**.

Of Note

Assessment should NOT:

Be viewed as an evaluation or accountability process.
Be accepted as being optional.
Be used to compare programs.

(Adapted from Stassen, Doherty, and Poe, 2001; and Guidelines for Assessment, 1993)

Nine principles of assessment

Nine *Principles of Assessment* were developed by a task force from the American Association for Higher Education (Alexander W. Astin; Trudy W. Banta; K. Patricia Cross; Elain El-Khawas; Peter T. Ewell; Pat Hutchings; Theodore J. Marchese, Kay M. McClenney; Marcia Mentkowski, Margaret A. Miller; E. Thomas Moran; and Barbara D. Wright).

The link to the original article is:
(http://www.aahe.org/assessment/principl.htm)

The nine principles include:

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

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

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

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

5. Assessment works best when it is ongoing, not episodic.

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

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

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

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

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CHAPTER 2
DEVELOPING AN ASSESSMENT PLAN

Purpose of this Chapter

The purpose of this chapter is to provide guidelines and suggestions for developing a plan for program assessment. Designing an assessment plan is not an easy task. The objectives of this chapter are to introduce you to the steps involved in designing an assessment plan and to provide you with suggestions to help you tailor the plan to match the learning outcomes of your program.

KEY TOPICS	**The key topics presented in this Chapter are:** • Chapter learning outcomes • Introduction to developing an assessment plan • Developing a program assessment plan • Flowchart describing assessment process • Sources and additional references Appendix 2A: Preliminary checklist for identifying program needs

Chapter learning outcomes

Readers of this chapter will have the ability to:

- recognize that a program assessment plan should be manageable, meaningful and sustainable
- identify the needs of the program in order to develop an appropriate assessment plan
- comprehend that assessment is a continuous improvement process
- utilize the plan-do-check-act cycle in developing a program assessment plan tailored to the program needs
- understand and identify the various steps in the assessment process

Introduction to developing an assessment plan

A crucial part of developing an assessment plan is to clarify the focus and content of your plan, which should be based on the needs of your program or unit. The assessment approach will depend on your program's mission or purpose.

Remember that the purpose of assessment can be to **improve**, **inform**, **prove** and/or **support** your program (refer to Chapter 1 for an explanation). Thinking of assessment in these terms will help you identify your needs (which is the first phase) as well as help you in devising the assessment plan.

Depending on the purpose of assessment, the plan can be an informal document to be internally distributed, or it can be a formal document with an external audience.

Whatever shape the assessment plan takes, it must be **manageable, meaningful and sustainable** and should **re-examine the goals and outcomes systematically**.

(Adapted from Allen and Noel, 2002; and Stassen, Doherty, and Poe, 2001)

At UCF, the assessment plan must be a formal document with both internal and external audiences. Recall that UCF's quality assurance committees will review the plan. It is also a document that may be viewed by external groups (e.g., SACS).

Remember to continually ask these questions during the design phase (refer to Chapter 1 for more suggestions on the characteristics of an effective assessment plan):

1. What are you trying to do?
2. How well are you doing it?
3. Using the answers to the first two questions, how can you improve what you are doing?
4. What and how does a program contribute to the development and growth of its students?
5. How can student learning be improved?

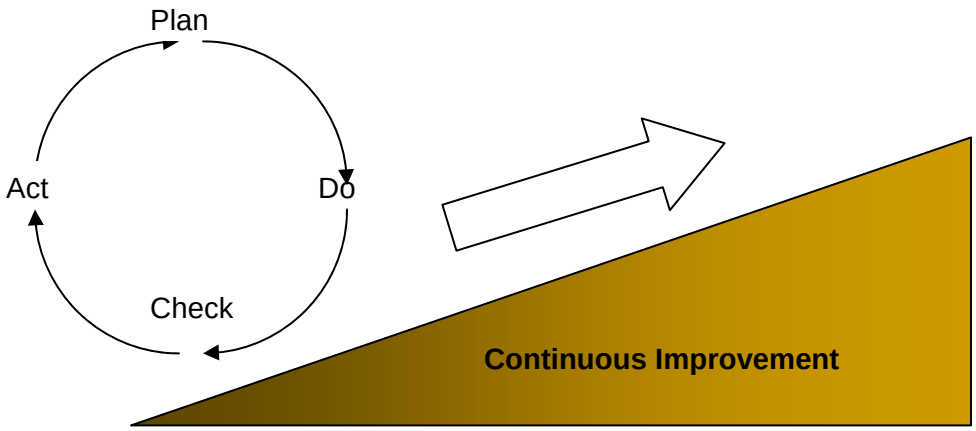
Of Note

Identifying the needs of the program should be the first task when you begin to think about the design of the assessment plan of your program.
Using a checklist will help you determine what those needs are.
Refer to Appendix 2A for the checklist.
(Adapted from Palomba et. al., 2000)

Developing a program assessment plan

Program assessment is a systematic, ongoing process that uses the results from measured outcomes to improve programs. Achieving the highest quality level programs, as well as being responsive to the needs of the students requires a well-defined systematic approach to continuous improvement.

Assessment is a continuous improvement process. In order to improve, you need to know where you are today and where you would like to go. This requires a clear articulation of the program's mission (purpose), vision (where you would like to go), goals (steps to getting where you would like to be), objectives or outcomes (what you need to achieve for each step in order to get there), and measures (how well you are currently doing). In order to improve, you need to take action. This includes analyzing your program or operations to determine needed changes, planning the changes, and taking action.
The Deming cycle or wheel (illustrated below) consists of a series of four separate but interlinked activities and contributes to the stabilization of the assessment process and enables the identification of continuous improvement opportunities. The plan-do-check-act cycle provides the basis for developing assessment plans that match the needs of your program, collecting and analyzing the information, and using the results for improvement of the program.



Plan

During this phase, the assessment plan is developed by first identifying the people responsible for the assessment process, and then identifying, developing and carefully articulating the program's mission, goals, and outcomes. It is during the planning phase that the outcome targets and the assessment methods to measure the outcomes are selected.

Step 1: **Organize for assessment.**

Before assessment can begin, the key players, committees and structures must be identified. One or more persons may lead the program assessment process, but it is crucial for all faculty to assume the responsibility for designing, implementing and carrying out the assessment process including reviewing the results and implementing improvements.

In addition, it is important to define the scope of the assessment plan. In particular, you need to determine what the assessment will include and what it will not include. Will you assess resources (e.g., facilities, faculty, equipment)? Will you assess processes (e.g., pedagogy, advising, feedback processes)? Will you assess results or outcomes? Who and what will give you the feedback?

The following figure can be useful when trying to determine the scope of your assessment. Circle each of the resources, processes, results, and feedback mechanisms that will be part of your assessment process.

RESOURCE	PROCESS	RESULTS	FEEDBACK
Students	Curriculum	Student Learning Outcomes	Alumni
Faculty, Staff	Instruction	Growth and Development	Employers
Facilities	Student Development Opportunities	Success	Parents
Space	Advising	Satisfaction	Community
Physical Resources	Co and Extra Curricular Activities	Service	Students
Financial Resources	Resource Management	Department or University Reputation	Faculty
		Community Impact	Department
			Program

Of Note

Faculty participation and ownership is essential for the success of program assessment.

Of Particular Note

Academic program assessment must include a major focus on student learning outcomes.

Step 2: **Define the mission of the program.**
The program mission is a broad statement of the directions, values and aspirations of the department with regard to its programs. It should provide a clear description of the purpose of the program and the learning environment. The mission should be aligned with the Department, College, and University's mission. **Chapter 3** provides more details.

Step 3: **Define the goals of the program.**
The goals of a program or unit must concur with those of the school or college, and ultimately with the goals of the institution. Program goals provide the basis for assessment and therefore should be defined adequately and clearly. Currently, UCF does not require that a program

report its goals, however it is strongly recommended that you develop goals first, since the outcome statements should stem from the goals. **Chapter 3** focuses on providing guidelines for defining goals.

Step 4: **Define the intended student learning outcomes of the program.**
Program goals are general while program outcomes are more specific and reflect the broader goals. The learning outcomes of a program describe the intended educational outcomes in terms of specific abilities, knowledge, values and attitudes that you want students in your program to possess. An in-depth discussion of student learning outcomes is provided in **Chapter 4**.

Of Note

The difference between goals and intended learning outcomes is in their *scope*. While both are related to learning outcomes, goals describe broad concepts and outcomes describe specific abilities, knowledge, values and attitudes.

Step 5: **Inventory existing and needed assessment methods and select assessment measures and methods.**
Identify, list and describe all available information and existing processes that can provide information that can be used for assessment. Referring back to the needs of the program and the desirable targets, identify what additional methods need to be used to provide you with the necessary information for assessment. More details on assessment methods are provided in **Chapter 5**.

Step 6: **Select assessment methods and identify assessment targets.**
Typically, several methods are used to measure the outcomes of the program and UCF requires at least two measures for each learning outcome unless you are using a normed measure or standardized test. Within a standardized test, you could identify more than one subsection that matches the outcome. You can also compare UCF student performance with the reference group (e.g., national mean score). For each student learning outcome, describe where you would like to be within a specified time period (e.g. 10% improvement in student performance within two years). Also, determine what standards are expected from students in your program. For some intended outcomes, you many want 100% of graduates to achieve them, but realize that this expectation is unrealistic for other learning outcomes. You may want to determine what proportion of your students achieves a specific level. If you have previously measured an outcome, it is helpful to use this as the baseline for setting your target for next year.

Do

This phase involves teaching your program and measuring the outcomes of your program. More details on collecting assessment data are provided in **Chapter 6**

Step 7: **Collect the data.**
After the plan has been developed, you must implement the plan. It is important to determine how the data will be collected, who will collect the data, and where and how the data will be archived. The data must also be kept secure.

Check

The purpose of this phase is to analyze the results and determine what actions need to be taken to improve the program. More details on analyzing and using results are provided in **Chapter 6**

Step 8: **Analyze the results.**
After the data have been collected, you must analyze the results. It is important to summarize the results in a meaningful way so that the faculty can review them and determine what actions are needed to improve the program.

Step 9: **Provide feedback.**
No matter how well assessment activities are planned and conducted, they are worthless to a program unless the plan incorporates a timely feedback mechanism. The results and information gained should be distributed to the faculty and other appropriate parties to obtain their ideas on how to improve the program.

Act

The objective of this step is to implement improvements to the program and to prepare for the following assessment cycle. More details on use of results are provided in **Chapter 6**

Step 10: **Implement changes.**
The results of the assessment must be used to identify changes to improve the program. These changes could be to the content of the curriculum, staffing, facilities, among others. At this point in the continuous improvement cycle, the planned changes should be implemented. In some cases, the changes are easy to implement, while in other instances the proposed changes will have to be implemented over a period of time or through a series of steps.

Step 11: **Develop plan to monitor the changes and compare the results.**
The implemented changes should be monitored to determine whether or not the changes had the desired effect. One way of achieving this is to use the same assessment plan as used in the previous cycle and

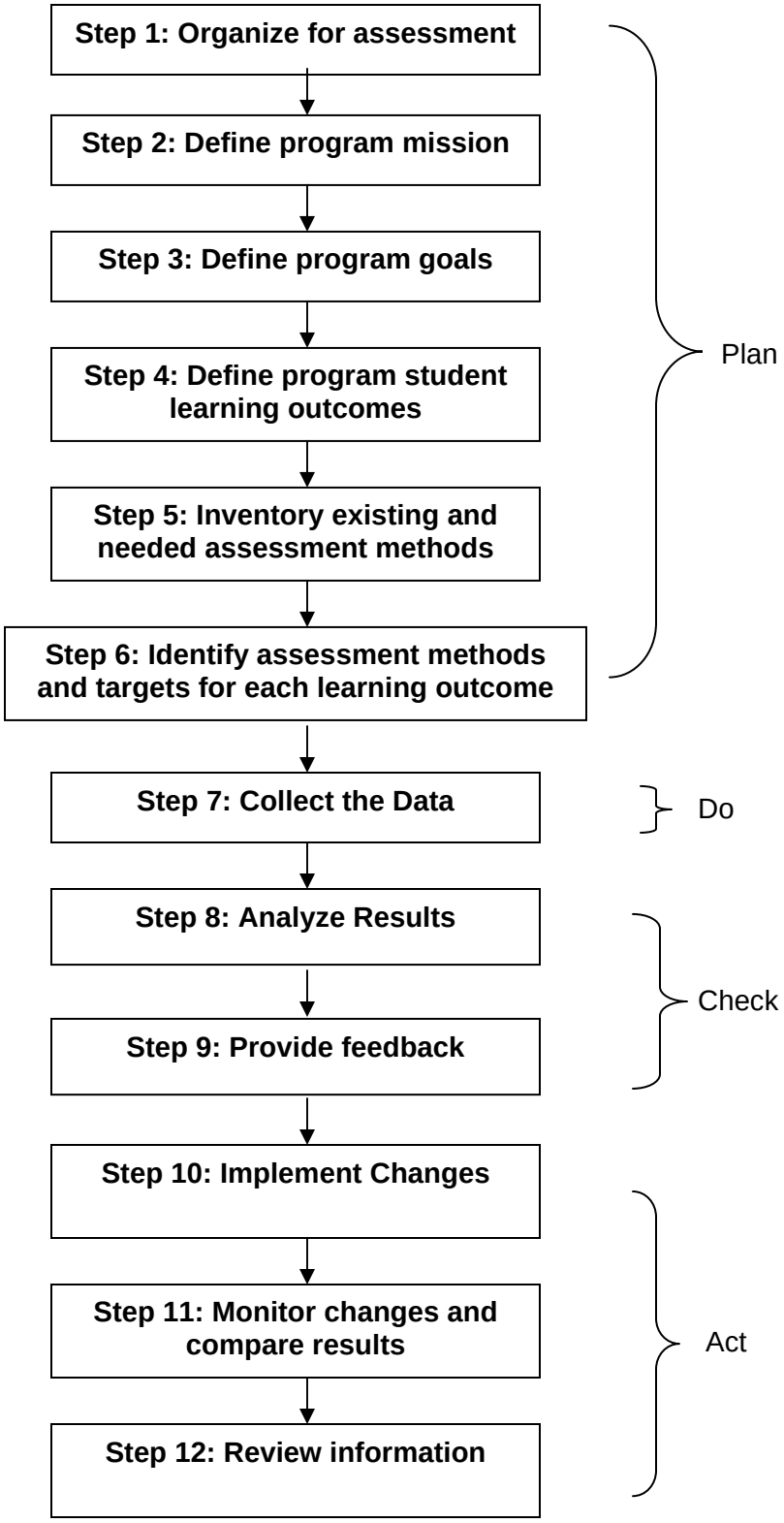
compare the actual results to the intended results. Any discrepancies should be carefully studied to determine the underlying cause. In other situations, when the outcomes have been met, the action might be to continue monitoring the outcome to ensure quality. You could define another outcome to begin monitoring.

Step 12: Review information.

Review all of the information obtained from the assessment process and determine how this will affect your next assessment plan. This provides the starting point for the next iteration of the plan-do-check-act cycle to continuous improvement of the academic program.

(Adapted from Chase and Aquilano, 1995; Harding, Dickerson, and Kehoe, 1999; Melnyk and Denzler, 1995; Outcomes Assessment Manual, 2000; and UCF Continuous Quality Improvement Assessment Process, 2003)

Flowchart describing assessment process



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APPENDIX 2A
Preliminary Checklist for Identifying Program Assessment Needs

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

The purpose of this checklist is to help you identify and determine your assessment needs.

What are you assessing?

- ☐ Undergraduate program
- ☐ Graduate program
- ☐ Track
- ☐ Minor program
- ☐ General Education program
- ☐ Other _____

Why are you assessing?

- ☐ For internal purposes (e.g. program review, etc.)
  - Good management
  - Quality motivation
  - Knowing where you are
  - Knowing where you have been
  - Knowing what is possible and how to get there
  - Other _____
- ☐ For external purposes
  - Regional and program-level accreditation
  - Apply for an award (e.g. Baldridge Award)
  - Other _____

What do you want to know?

- ☐ Discipline-specific knowledge
- ☐ Competency skills
- ☐ Technology skills
- ☐ Critical thinking skills
- ☐ Communication skills
- ☐ Attitudes
- ☐ Success of graduates
- ☐ Other _____

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From whom will you collect the data?

- ☐ New students
- ☐ Current students
- ☐ Graduating students
- ☐ Alumni
- ☐ Faculty
- ☐ Employers of graduates
- ☐ Other _____

Who will see the results?

- ☐ Department
- ☐ Deans and administrators
- ☐ Advisory committees
- ☐ Review committees
- ☐ Accrediting bodies
- ☐ Students
- ☐ Alumni
- ☐ Other universities
- ☐ Other _____

How will the data be used?

- ☐ Internal program review
- ☐ Accreditation review
- ☐ Curriculum review
- ☐ Committee report
- ☐ Career services
- ☐ Recruiting and marketing
- ☐ Other _____

How often will you collect the data?

- ☐ One-time projects
- ☐ Each semester
- ☐ Each year
- ☐ Each assessment cycle
- ☐ Other _____

Who will collect the data?

- ☐ Individual faculty
- ☐ The department
- ☐ The college
- ☐ The university
- ☐ Other _____

(Adapted from Palomba et al., 2000)

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CHAPTER 3
DEFINING PROGRAM MISSION (PURPOSE) AND GOALS

Purpose of this Chapter

The purpose of this chapter is to assist you in defining the program's mission and identifying program goals. Understanding and clearly stating what your program is trying to accomplish serves as a foundation for a successful assessment plan. It is important to define and obtain a consensus on program goals. Although goals are not currently required in UCF's assessment plan collection system, it is recommended that you develop program goals as a step prior to developing program outcomes. This chapter presents some guidelines that your program can follow to help you do this.

KEY TOPICS

The key topics presented in this chapter are:

- Chapter learning outcomes
- Defining the program mission statement
- Format and examples of program mission statements
- Defining the program vision statement
- Example of a program vision statement
- Defining the program's values and guiding principles
- Examples of value statements and guiding principles
- Defining program goals
- Getting started
- Writing and reviewing program goals
- Format and examples of program goal statements
- Sources and additional references

Appendix 3A: Guidelines for writing an effective mission statement
Appendix 3B: Checklist for reviewing a mission statement
Appendix 3C: Checklist on writing and reviewing a vision statement
Appendix 3D: Worksheet for identifying and defining program goals or learning outcomes
Appendix 3E: Checklist for reviewing goal statements

Chapter learning outcomes

Readers of this chapter will have the ability to:

- define program mission, vision, values and guiding principles and goals
- differentiate between goals and student learning outcomes
- recognize the difference between goals and learning outcomes is in their scope
- participate in activities to define program goals
- develop program mission, vision, values and guiding principles and goals that are specific and distinctive to a program
- write effective program mission, vision, values and guiding principles and goals
- identify and construct program mission, vision, values and guiding principles and goals statements that adhere to the correct format
- review and revise program mission, vision, values and guiding principles and goals statements

Defining the program mission statement

Stating the mission or purpose of the program is a required element of assessment plans at UCF. The program mission is a **broad statement** of **what the program is, what it does, and for whom it does it**. It should provide a clear description of the **purpose of the program** and the **learning environment**. For a given program, the mission statement should, in specific terms, reflect **how the program contributes to the education and careers of students** graduating from the program. Mission statements for academic programs should reflect how the teaching and research efforts of the department are used to enhance student learning. The mission should be **aligned with the Department, College, and University missions.** In addition, the mission should be **distinctive** for your program.

This section details the various elements and attributes of a well-defined mission statement. It is important that the program's mission statement support and endorse UCF's institutional mission. Refer to the Mission and Goals web page to view UCF's official mission statement.

- **Briefly, state the purpose of the academic program**.
  State the primary purpose of your program - the primary reason(s) why you perform your major activities or operations (e.g. teaching, research, and service). For example, this might include, educating students to prepare them for particular jobs and/or to prepare them for graduate school. Explain why you do what you do.

- **Indicate the primary functions or activities of the program**.
  Highlight the most important functions, operations, outcomes, and/or offerings of your program.

- **Indicate who the stakeholders are**.
  Include the primary groups of individuals for whom you are providing your program and those who will benefit from the program and its graduates (e.g., students, faculty, staff, parents, employers, etc.).

- **Ensure that the mission statement clearly supports the institution's mission.**
  Make sure that your mission is aligned with the mission of the University, the college, and the department.

- **The mission should be distinctive.**
  Does your statement distinguish you from other programs or units? If the name was removed, it should not be applicable to another program or unit.

Of Note

Refer to Appendices 3A for guidelines for writing an effective mission statement and 3B for a checklist on reviewing mission statements.

Format of a mission statement

The following is a general format that can be used when developing a mission statement:

"The mission of (name of your program or unit) is to (your primary purpose) by providing (your primary functions or activities) to (your stakeholders)." (Additional clarifying statements)

Note that the order in which the statements are made may vary from this format, but the content should be easily identified.

Examples of program mission statements

Poor: The mission of Hypothetical Engineering is to provide a broad engineering education.

The statement is very vague and does not distinguish this particular program from other engineering programs. It lacks information about the primary functions of the program and does not identify the stakeholders. Additionally, there is no indication that the program's mission is aligned with UCF's mission.

Better: The mission of Hypothetical Engineering is to educate students from diverse backgrounds in the principles of Hypothetical Engineering that will prepare them for both current and future professional challenges in Hypothetical Engineering.

This statement is better because it identifies the stakeholders as well as a primary function of the program. However, it still is not a distinctive statement.

Best: The mission of Hypothetical Engineering bachelor's degree program is to educate students from diverse backgrounds in the fundamental skills, knowledge, and practice of Hypothetical Engineering (through courses and an internship) in order to (1) prepare them for Hypothetical Engineering positions in service or manufacturing industries and (2) prepare them for continuing for advanced degrees in Hypothetical Engineering or related disciplines. The program promotes a commitment to continued scholarship and service among graduates and will foster a spirit of innovation. Also, it promotes an environment that is inclusive and diverse.

This is a very effective mission statement. The mission of the program is very clearly defined.

Defining the program vision statement

A vision statement is a **short and memorable** description of what a program will look like if it succeeds in implementing its strategies and if it achieves its full potential. Stating a vision for a program is not a required step in the UCF assessment documentation system; however, it can be very useful in helping guide the department in setting goals for its program.

The program vision attempts to answer the following types of questions:

- What would you like the program to become?
- In what direction(s) would you like the program to move?
- What program outcomes would you like to see in the future?

Example of a program vision statement

The vision for Hypothetical Engineering is to become one of the top ten programs nationally that is able to attract quality students and place graduates at top engineering firms.

Of Note

Refer to Appendix 3C for a checklist on writing and reviewing a vision statement.

Defining the program's values and guiding principles (Optional)

Values and guiding principles are short statements describing the code of behavior to which an organization or program adheres or aspires. **Value statements** indicate what your program holds and represents. Guiding principles indicate how you would like your program to operate. Stating values and guiding principles for a program is not a required step in the UCF assessment documentation system; however, it can be very useful in helping guide the department in setting goals for its program.

Some examples of values include:

- Integrity
- Respect
- Community
- Excellence
- Trust
- Inclusiveness

Example of a value statement

Integrity, respect, community, and excellence are the core values that hold together our program and guide our conduct, performance, and decisions.

Some examples of guiding principles include:

- Teamwork
- Innovate for excellence
- Plan
- Partner for more effective operations
- Seize the future
- Build community among students

Example of a guiding principle

Our program strives to develop partnerships and work in teams to achieve our mission, build community among our students, and innovate to achieve excellence.

Of Note

When developing your values and guiding principles, answer the following questions: What values would you like your program or students to uphold? How would you like your program or students to operate or behave?

Of Note

UCF Policy does not currently require that you define the goals of your program. However, it is *recommended* that you do so after stating your mission. The process of thinking about and articulating what your program is trying to accomplish in terms of clearly stated goals greatly enhances the success of program assessment and the development of outcomes.

Defining program goals

Definition

Goals are broad statements that describe the long-term program targets or directions of development. They state in broad terms what the program wants to accomplish (in terms of student outcomes) or to become over the next several years.

Goals provide the basis for decisions about the nature, scope, and relative priorities of various activities in a program. They are used in planning and should help move the program to attain its vision.

In order for program assessment to be successful, the department must reach a consensus on the goals of the program and have an understanding of what the program is trying to accomplish, as well as how the goals are addressed in the curriculum. The goals of a program or unit must be consistent with those of the school or college, and

ultimately with the goals of the institution. It is necessary to ensure that agreement is reached on the mission statement before developing program goals.

Getting started

The general process for writing goals should start with the vision statement for the program (e.g., become the best in the nation). Think about what that program would look like and how it should operate (refer to your mission) to reach that vision and write down these characteristics. This may require improving student outcomes, maximizing employment rates, and minimizing time to degree. Generate a list of potential "goals" and then prioritize them. Write these more formally as goal statements.

Outlined below are some activities that you can do before writing the program goals that can help you articulate and shape goal statements. These guidelines can also be used when developing student learning outcomes, which are the focus of **Chapter 4**. It is not necessary to perform all of these suggested activities. Two or three may be sufficient in helping you to start identifying and defining the program's goals and intended outcomes.

Approach based on the "ideal" student or graduate

Conduct discussions and brainstorming sessions with the faculty. The discussions can focus on topics such as:

- Describe an "ideal" student at various phases in your program, focusing on the abilities, knowledge, values and attitudes that you feel that this student has either acquired or have been supported as a result of your program. Then ask:
    - **Cognitive skills**: What does the student know?
    - **Performance skills**: What can the student do?
    - **Affective skills**: What does the student care about?
- Describe how the students' experiences in the program have contributed to their abilities, knowledge, values and attitudes.
- List the skills and achievements expected of graduates of the program.
- Describe the program alumni in terms of their achievements, such as career accomplishments, lifestyles, and community involvement.

(Adapted from Harding, Dickerson, and Kehoe, 1999; Palomba et. al., 2000; Stassen, Doherty, and Poe, 2001; and Troy and Lowe, 2003)

Collect and review current program goals

Review any existing goal or outcome statements such as those from:

- Catalog descriptions
- Program review reports
- Mission and vision statements
- External agencies (e.g., Southern Association of Colleges and Schools Commission on Colleges [SACS - COC], National Council for Accreditation of Teacher Education [NCATE], Association to Advance Collegiate Schools of business [AACSB], and Accreditation Board for Engineering and Technology [ABET])

List five to seven of the most important goals identified in the sources listed above. Prioritize the goals depending on their importance to your department and their universality (i.e., how well they apply to different program tracks, if applicable). Next, determine whether the goal is best described as knowledge, abilities, attitudes, values, or a combination of these. A goal can be described by more than one term. See the following illustration.

Goal	Knowledge	Abilities	Attitudes	Values
1	X	X		
2		X		X
3			X	X

(Adapted from Assessment Handbook, 2003)

Have faculty complete a goals inventory of their courses

Faculty can complete a goals inventory for the courses they teach. The results of the goals inventory may provide a starting point for defining your program's goals.

(Refer to Angelo and Cross, 1993, for a self-scorable version of a Teaching Goals Inventory)

The Center for Teaching at The University of Iowa describes it as:
"The Teaching Goals Inventory (TGI) is a self-assessment of instructional goals. Its purpose is threefold: (1) to help college teachers become more aware of what they want to accomplish in individual courses; (2) to help faculty locate Classroom Assessment Techniques they can adapt and use to assess how well they are achieving their teaching and learning goals; and (3) to provide a starting point for discussion of teaching and learning goals among colleagues."

(From University of Iowa's website on TGI - http://www.uiowa.edu/~centeach/tgi/index.html)

Collect and review instructional material

Review course syllabi, assignments, tests and any additional materials. Categorize the instructional materials into several groupings such as:

- Recall or recognition of factual information.
- Application and comprehension.
- Critical thinking and problem-solving.

Review other programs' goals

- Review program goals and intended outcomes of other departments at your university.
- Review program goals and intended outcomes of similar departments at other universities.

Of Note

You can review the program missions, goals and outcomes of other programs at UCF by accessing the visitor page at the Operational Excellence and Assessment Support website.

Use a Delphi technique

Conduct a panel discussion about program goals or outcomes using a facilitator. Each member of the panel can be asked to identify and list criteria that they believe are important for program goals or outcomes. Combine all criteria into one list and have each member anonymously rank the criteria as being very, somewhat or not important. Tabulate the results and show them to the panel. Discuss the results and repeat the process until consensus is reached before writing the goal and outcome statements.

(Adapted from Harding, Dickerson and Kehoe, 2002; Palomba et. al., 2000; and Stassen, Doherty, and Poe, 2001; and Guidelines for Assessment, 1993)

Writing program goals

Once you have reached an understanding of the mission of the program and the faculty members are in agreement on what the program is trying to accomplish, you can start writing the program goals. The following are some guidelines for writing program goals:

- Identify **three or more goals** that are important (i.e., strongly related to the mission and that will help to achieve the vision).
- Goal statements should describe the expected performance of the student or specific behaviors expected from graduates of the program.
- Don't identify too many goals, particularly when first starting out.

Format of a goal statement

The general format of a goal statement is: "To (action verb) (object) (modifiers)."

Example

To improve the success of graduates in finding employment in the field.

(Adapted from Stassen, Doherty, and Poe, 2001)

Examples of program goals

Poor: To teach students engineering principles.

This is an inadequate goal statement because the focus is on the teaching rather than on the expected behavior of graduates of the program.

Better: To prepare students adequately.

This is better than the first example. Although this statement does not specifically explain the expectations of graduates, the focus is on student learning and not the teaching activity.

***Best*:** a. To prepare students for graduate school.
b. To have students graduate from the program with the necessary skills and knowledge to succeed in Hypothetical industry.
c. To prepare students to be successful in Hypothetical industry careers.
These are good examples of program goal statements that include a brief description of the expected actions of students of the program.

Of Note

Refer to Appendix 3D for a worksheet on identifying and defining goals.

Reviewing your program goals

After generating a list of program goals, the following questions can help to determine whether the list is complete and will be of value to your program:

- Do your goals describe desired aspects of a successful program?
- Are your goals consistent with your mission?
- If you achieve your goals, have you reached your vision?
- Are your goals aligned with your values?

Of Note

Refer to Appendix 3E for a checklist for reviewing a list of program goals.

Sources and additional references

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APPENDIX 3A
Guidelines for Writing an Effective Mission Statement

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

The purpose of this checklist is to help you develop your mission statement.

What do you do? What are your primary functions and activities?

- ☐ Educate students
- ☐ Conduct research
- ☐ Other _____

Why do you do these activities? What is your purpose?

- ☐ To enable students to get jobs or go to graduate school
- ☐ Advance the state of knowledge
- ☐ Other _____

For whom do you do them?

- ☐ Students
- ☐ Prospective Employers
- ☐ Other _____

Write your Mission Statement: "The mission of (your office name) is to (your primary purpose) by providing (your primary functions or activities) to (your stakeholders)." (Additional clarifying statements)

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APPENDIX 3B
Checklist for Reviewing a Mission Statement

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

The purpose of this checklist is to help you determine if the mission statement is effective and clearly defines the current mission of the department/program.

- ☐ **Is your mission statement brief and memorable?**

- ☐ **Is it distinctive?**

- ☐ **Does it clearly state the purpose of the program or unit?**

- ☐ **Does it indicate the primary functions or activities of the program?**

- ☐ **Does it indicate who the stakeholders are?**

- ☐ **Does it clearly support the department's, college's, and institution's missions?**

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APPENDIX 3C
Checklist for Writing and Reviewing a Vision Statement

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

The purpose of this checklist is to help you develop your vision statement.

What would you like to become?

- ☐ The best
- ☐ A leader
- ☐ Regionally or nationally recognized
- ☐ Other _____

What would you like to strive for?

- ☐ Reputation
- ☐ Excellence
- ☐ Other _____

What would you like your program to look like in the future?

Write your Vision Statement:

The purpose of this checklist is to help you review your vision statement.

- ☐ Does it indicate what you would like your program to become or strive for?
- ☐ Does it indicate what your program will look like in the future?
- ☐ Is your vision inspirational?
- ☐ Will it pull you in a desired direction?

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APPENDIX 3D
Worksheet for Identifying and Defining Program Goals

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

After each faculty member has completed this worksheet, arrange a meeting at which you can compare notes and discuss the results. The reason for this exercise is to summarize and articulate 3 – 5 goals that the faculty can agree on.

1. **Identify and list all the department goals of which you are aware. Refer to catalog descriptions, program review reports, mission statements, and external agencies (e.g., SACS).**

2. **Describe "the perfect student" in your program in terms of his or her knowledge, abilities, values and attitudes. Which of these characteristics do you think can be directly attributed to the program experience?**

3. **Ask what this "ideal" student:**
    a. **Knows**

    b. **Can do**

    c. **Values**

4. **Identify program experiences that contributed to producing and supporting the "ideal" student in your program.**

5. **What should a graduate of your program know, do, and value?**

6. **List the desired achievements of your alumni.**

APPENDIX 3E
Checklist for Reviewing Goal Statements

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

The purpose of this checklist is to help you determine if the goal statements are appropriate.

☐ **Do your goals describe desired performance?**

☐ **Are your goals consistent with your mission?**

☐ **If you achieve your goals, have you reached or moved toward your vision?**

☐ **Are your goals aligned with your values?**

CHAPTER 4
DEFINING STUDENT LEARNING OUTCOMES (SLO)

Purpose of this Chapter

The purpose of this chapter is to provide you with an overview and definition of student learning outcomes. The importance of explicitly defining expectations and standards is emphasized in this chapter. Also included is an extensive discussion on how to write clear and precise statements of outcomes for your program. This is an integral part of the assessment plan and your department should focus on developing and articulating student learning outcomes.

KEY TOPICS

The key topics presented in this chapter are:

- Chapter learning outcomes
- Defining student learning outcomes
- Benefits of student learning outcomes
- Curriculum analysis and syllabus analysis
- Developing student learning outcomes
- Types and levels of educational objectives
- Key words
- Guidelines for writing student learning outcome statements
- Format of a learning outcome statement
- Examples of learning outcome statements
- Sources and additional references
-

Appendix 4A: Summary of guidelines for developing student learning outcomes

Appendix 4B: Checklist for reviewing student learning outcomes

Chapter learning outcomes

Readers of this chapter will have the ability to:

- recognize that a student learning outcome describes a required learning achievement
- identify the importance of and benefits associated with articulating student learning outcomes
- develop learning outcome statements that are specific and distinctive to a program
- write effective learning outcome statements that describe intended and not actual outcomes
- select learning outcomes that are measurable and that can be measured by more than one assessment method
- focus on a few learning outcomes that can lead to improvements to the program

- identify and construct learning outcome statements that adhere to the correct format
- indicate performance indicators for each outcome statements
- utilize appropriate key words when writing learning outcome statements
- review and revise learning outcome statements

Defining student learning outcomes

Student learning outcomes can be considered as special types of objectives. An objective is a measurable target with a time limit that must be met on the way to attaining a goal.

Definition

Student Learning Outcomes (SLOs) are specific statements that describe the required learning achievement that must be met on the way to attaining the degree and meeting the goals of the program.

Of Note

Please note that written statements of outcomes are referred to as objectives and student learning outcomes in the literature. From this point on in this handbook, we will refer to them as learning outcomes or student learning outcomes and will be abbreviated as SLO.

After agreed upon program goals have been stated, learning outcomes can be defined. Program outcomes are specific statements that describe the desired or intended learning outcomes of a single program. The outcome statements should be derived from the goal statements, which in turn should be aligned with the university's mission. Goals are broad statements, while learning outcomes are precise, specific and clear statements about the intended outcomes of a program. To demonstrate that an outcome statement is related to and derived from a program goal the following format can be used. List the intended learning outcomes under each program goal as follows:

Goal 1	Goal 2	Goal 3
Outcome 1	Outcome 3	Outcome 8
Outcome 2	Outcome 4	Outcome 9
	Outcome 5	Outcome 10
	Outcome 6	
	Outcome 7	

(Adapted from Harding, Dickerson, and Kehoe, 1999)

Student learning outcomes describe **specific behaviors** that a student of your program should demonstrate after having completed the program. SLO statements should focus on the **expected knowledge, abilities, values and attitudes** of a student after the

completion your program. More detail will be provided in this chapter on how to define and write good, clear statements of intended outcomes.

Of Note

> Keep in mind when developing learning outcomes that there is a clear distinction between intended and actual outcomes.
> **Intended outcomes** are statements of expectations. **Actual outcomes** indicate the results of the assessment process.
> Assessment plans should include INTENDED outcomes, statements describing what is expected from graduates of your program, or from students as they progress through your program.
>
> *(Adapted from Palomba and Banta, 1999; and Troy and Lowe, 2003)*

Curriculum Analysis and Syllabus Analysis

Curriculum analysis provides a means to chart exactly which courses will address and assess which program level student learning outcomes. The resulting matrix provides assurance to the department that, assuming certain course sequences are taken by the student candidates for that major degree, they will have the opportunity to achieve those student learning outcomes.

Syllabus analysis is an especially useful technique when multiple sections of a department's course are offered by a variety of instructors. The analysis is a method used to ensure that each section covers agreed upon course material related to specific program level student learning outcomes. Across a program, syllabus analysis provides a way to track courses that include program level student learning outcomes (which are opportunities to gather program student learning outcomes assessment evidence). Each syllabus is examined to determine which student learning outcomes are taught and assessed in an individual course. Syllabus analysis will also allow a look at how specific outcomes will be assessed in which courses.

Of Note

> Neither curriculum analysis nor syllabus analysis are a form of assessment for student learning outcomes. Appendix 3D includes a worksheet that describes some activities that can be done prior to developing student learning outcomes. Refer to that worksheet for some useful exercises and suggestions that may help you before you start developing and writing learning outcome statements.

Of Note

> Remember the purpose of assessment is not to evaluate, judge or compare faculty or programs, but to use what is learned from the assessment activities to improve programs.

Benefits of student learning outcomes

The following are the some of the advantages associated with developing and using student learning outcomes.

- **Program improvement**
  One of the primary purposes of student learning outcomes assessment is to provide feedback to determine how the program can be improved to enhance student learning.

- **Identification of best practices in instruction**
  Learning outcomes can be used by faculty to help them evaluate and improve their teaching. Faculty can share teaching strategies that are more effective in helping students reach student learning outcomes.

- **Course design and revision**
  SLOs can help in the design of new courses with in terms of rationalizing the need for that new course and its positioning in the curriculum. Additionally, learning outcomes can be used by the faculty in the classes that they teach to assist them in developing assignments that include the intended knowledge, abilities, values and attitudes of that program.

- **Curricular assessment and change**
  The use of learning outcomes can help departments think about their curriculum. A department can determine in which of the program courses each SLO is addressed to determine if each outcome is addressed adequately across the curriculum and where gaps exist. Plans can be made to introduce, reinforce and assess the important outcomes in the appropriate courses in the curriculum.

- **Communicate instructional intent**
  SLOs can provide a means of communicating expectations to students. Developing clearly defined learning outcomes available to students will aid in establishing criteria for grading assignments and tests.

- **Increased awareness of learning (for students)**
  SLOs can help students realize “what they know” and can help them to communicate this knowledge.

- **Common language**
  SLOs can help departments develop a common language that can be shared with faculty, staff, students, the public, and other constituencies. A common language can facilitate communication among departments and disciplines, also.

- **Advising tools**
  SLOs can assist the advising process because advisors can communicate to the students the expectations of the program by referring to the expected learning outcomes.

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- **Improving promotional materials**
  Student learning outcome statements can be presented in promotional materials to attract students and promote a program. Additionally the language used can be significant when devising keywords to attract "hits" to a webpage.

- **Targets for assessment and accreditation**
  Defining statements of learning outcomes is an integral part of the assessment process and also necessary for the accreditation process.

(Adapted from Gronlund, 2000 and Roth, Beyer, and Gillmore, 2002)

Of Note

Whenever possible, include the SLO statements in the course syllabus to provide students with a clear definition and understanding of course expectations that relate to program outcomes.

Developing student learning outcomes

Of Note

If you need help developing student learning outcomes, you can contact OEAS.

In developing student learning outcomes, think **SMART** *(from Drucker, 1954)*:

Specific

- Define learning outcomes that are **specific** to your program. Include in clear and definite terms **the expected abilities, knowledge, values and attitudes** a student who graduates from your program is expected to have.

- Focus on **intended outcomes** that are **critical to your program**. When the data from the assessment process are known, these outcomes should create **opportunity to make improvements** in the program that is being offered to your students.

Measurable

- The **intended outcome** should be one for which it is **feasible** to collect accurate and reliable data. Refer to **Chapter 5** for a detailed list of direct and indirect methods of assessment.

- Consider your **available resources** (e.g., staff, technology, assessment support, institutional level surveys, etc.) in determining whether the collection of data for each student learning outcome is a reasonable expectation.

- Include **more than one measurement method** that can be used to demonstrate that the students in a particular program have achieved the expected outcomes

of that program. The focus of **Chapter 5** is on assessment techniques and methods that can be used.

Aggressive but Attainable

"Don't let the perfect divert you from what is possible." When defining the learning outcomes and setting targets, use targets that will move you in the direction of your vision, but don't try to "become perfect" all at once.

The following is a collection of **questions** that might help you to formulate and define aggressive but attainable outcomes for your program.

- How have the students' experiences in the **program contributed** to their abilities, knowledge, values and attitudes? Ask:
  - **Cognitive skills**: What does the student know?
  - **Performance skills**: What does the student do?
  - **Affective skill**: What does the student care about?
- What are the knowledge, abilities, values and attitudes **expected of graduates** of the program?
- What would the "**perfect" program** look like in terms of outcomes?
- What would a "**good" program** look like in terms of outcomes?

Of Note

At least two assessment methods should be used to evaluate each program outcome. There are performance indicators (or levels of performance measures) associated with the assessment methods (e.g. 10% improvement on a standardized exam– the assessment method is the examination and the performance indicator associated with this method is 10% improvement of the exam score.)
Chapter 5 provides a detailed discussion on assessment methods.

Results-oriented and Time-bound

- When defining the outcomes, it is important to describe **where you would like to be** within a **specified time period** (e.g., 10% improvement in exam scores within one year, 90% satisfaction rating for next year, 10% improvement in student communication performance within two years). Also, determine what **standards are expected** from students in your program. For some learning outcomes, you may want 100% of graduates to achieve them. This expectation may be unrealistic for other outcomes. You may want to determine what **proportion** of your **students achieve a specific level** (e.g., 80% of graduates pass the written portion of the standardized test on the first attempt). If you have previously measured an outcome, it is helpful to use this as the baseline for setting a target for next year.

(Adapted from Guidelines for Program Assessment: Standards and Levels, 2002; and UCF Continuous Quality Improvement website, 2003)

Of Note

The targets or performance levels for each outcome may be more appropriately defined and stated when describing the particular assessment methods.

Types and levels of educational objectives

Bloom's Taxonomy of Educational Objectives (1956) is a well-known, detailed and structured framework that can be used for identifying and writing learning outcomes. The Taxonomy identifies three domains of educational outcomes: **cognitive, skills and affective**. A team of educational psychologists, headed by Benjamin Bloom, formulated a classification of educational activities in 1956, which is widely known as Bloom's Taxonomy. They went on to develop a classification system for the cognitive and affective domains but did not complete the system for the skills domain. Other researchers have since developed a classification system for the skills domain (Bloom, Englehard, Furst, Hill, and Krathwohl, 1956; Gronlund, 2000; Krathwohl, Bloom, and Masia, 1964; Harrow, 1972; and Simpson, 1972).

Cognitive:

This domain involves knowledge recall and intellectual skills (such as comprehending, organizing ideas and analyzing data). The classification system divides the cognitive skills into six levels ranging from simple outcomes (behaviors) to the most complex outcomes (behaviors). Bloom's six cognitive domain levels ranging from basic to most complex are: knowledge, comprehension, application, analysis, synthesis, and evaluation. A brief description of each is provided below.

Cognitive	Description
1. Knowledge (represents lowest level of learning)	Ability to observe and remember previously learned information; knowledge of specific facts, terms, concepts, principles, ideas, events, places, etc.; mastery of subject material.
2. Comprehension (represents lowest level of understanding)	Ability to understand information and grasp material; translating knowledge from one form to another; interpreting, comparing and contrasting material; predicting consequences and future trends.
3. Application (represents higher level of understanding)	Ability to use information, learned material, methods, concepts, theories, principles, laws and theories in new situations; problem solving using required knowledge or skills.
4. Analysis (represents a higher intellectual level)	Ability to break down material and recognition of organization structure; identification of components and relationships between components; recognition of patterns and hidden meanings.
5. Synthesis (represents a higher intellectual level)	Ability to combine parts or apply prior skills and knowledge to produce a new whole; integrate ideas into a solution; generalize from given facts; propose a plan of action; formulate new classification methods.
6. Evaluation (represents highest cognitive level)	Ability to judge and assess the value of theories and presentations, based on their value, logic or adequacy, for a given purpose; compare and make choices based on reasoned argument; verify the value of evidence; recognize subjectivity.

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(Adapted from Allen and Noel, 2002; Gronlund, 2000; Palomba and Banta, 1999; Roth, Beyer, and Gillmore, 2002; Designing Valuable Assessment Plans: Evaluating Assessment Strategies, 2003; and DLRN's Technology Resource Guide, 2003)

Affective:

Affective learning is concerned with attitudes, values, interests, appreciation and feelings toward people, ideas, places and objects. Values refer to views and ideas that an individual believes in. Affective outcomes range from receiving (or willingness to participate in an activity) to adopting a value system that directs behavior.

Affective	Description
1. Accepting	Willingness to participate in an activity or to attend to a stimulus; getting and holding the attention of students.
2. Responding	Actively participates; demonstrates interest in an object, activity or phenomena; seeks or pursues this object, activity or phenomena
3. Valuing	Value or worth attached to an object, activity or phenomena; varies from simple acceptance to commitment.
4. Organization	Compare and contrast and resolve conflict to build a consistent value system; emphasis on comparing and synthesizing values.
5. Characterization by Value	Adopt a value system for a length of time that contributes to a particular "lifestyle" (i.e. directs behavior).

Skills:

The original researchers did not develop a classification method for the skills domain. Other researchers, including Harrow (1972) and Simpson (1972), provided two classification methods. The one proposed by Simpson (1972) is used in this manual to describe the psychomotor (skills) domain. The skills domain is used to classify movement patterns and behaviors.

Skill	Description
1. Perception	Uses sense organs to obtain cues to guide action; ranges from awareness of stimulus to translating cue perception into action.
2. Set	Readiness to take action; includes mental, physical and emotional set (or readiness to act).
3. Guided Response	Knowledge of the steps required to perform a task; includes imitation and trial-and-error.
4. Mechanism	Perform tasks in a habitual manner, with a degree of confidence and proficiency.
5. Complex Overt Response	Skillful performance of motor acts involving complex patterns of movement.
6. Adaptation	Skillful performance of motor acts involving complex patterns of movement; modifies movement patterns to account for problematic or new situations.
7. Origination	Creating new movement patterns to account for problematic or new situations; creates new tasks that

	incorporate learned ones.

(Adapted from Allen and Noel, 2002; and Gronlund, 2002).

Key words

The three domains of educational objectives were described in an earlier section. In this section, a collection of verbs is provided to help you in writing the learning outcome statements.

Of Note

You should use concrete verbs such as *define, classify, operate, formulate*, rather than passive verbs such as *be exposed to* or vague verbs such *understand, know*.

Examples of action words that are used frequently in stating learning outcome statements are provided in the table below:

Cognitive Key Words:

Knowledge	Arrange, define, describe, duplicate, enumerate, identify, indicate, know, label, list, match, memorize, name, reads, recall, recognize, record, relate, repeat, reproduce, select, state, view, underline
Comprehension	Classify, cite, convert, defend, describe, discuss, distinguish, estimate, explain, express, generalize, give examples, identify, indicate, infer, locate, paraphrase, predict, recognize, report, restate, review, rewrite, select, suggest, summarize, tell, trace, translate, understand
Application	Act, administer, apply, articulate, assess, change, chart, choose, collect, compute, construct, contribute, control, demonstrate, determine, develop, discover, dramatize, employ, establish, extend, give examples, illustrate, implement, include, inform, instruct, interpret, investigate, manipulate, operate, organize, participate, practice, predict, prepare, preserve, produce, project, provide, relate, report, schedule, shop, show, sketch, solve, teach, transfer, translate, use, utilize, write
Analysis	Analyze, appraise, breaks down, calculate, categorize, compare, contrast, correlate, criticize, debate, determine, diagram, differentiate, discriminate, distinguish, examine, experiment, focus, identify, illustrate, infer, inspect, inventory, limit, outline, point out, prioritize, question, recognize, relate, select, separate, subdivide, solve, test
Synthesis	Adapt, anticipate, arrange, assemble, categorize, collaborate, collect, combine, communicate, compile, compose, construct, create, design, devise, develop, explain, express, facilitate, formulate, generate, incorporate, individualize, initiate, integrate, intervene, manage, model, modify, negotiate, organize, perform, plan, prepare, produce, propose, rearrange, reconstruct, reinforce, relate, reorganize, revise,

	set up, structure, substitute, validate, write
Evaluation	Appraise, argue, assess, attach, choose, compare, conclude, contrast, criticize, critique, decide, defend, enumerate, estimate, evaluate, grade, interpret, judge, justify, measure, predict, rate, reframe, revise, score, select, support, value

Affective Key Words:

Accepting	Ask, choose, describe, follow, give, hold, identify, locate, name, point to, reply, select, use
Responding	Answer, assist, compile, conform, discuss, greet, help, label, perform, practice, present, read, recite, report, select, tell, write
Valuing	Complete, describe, differentiate, explain, follow, form, initiate, invite, join, justify, propose, read report, select, share, study, work
Organization	Adhere, alter, arrange, combine, compare complete, defend, explain, generalize, identify, integrate, modify, order, organize, prepare, relate, synthesize
Characterization by Value	Act, discriminate, display, influence, listen, modify, perform, practice, propose, qualify, question, revise, serve, solve, use, verify

Skills Key Words:

Perception	Choose, describe, detect, differentiate, distinguish, identify, isolate, relate, select, separate
Set	Begin, display, explain, move, proceed, react, respond, show, start, volunteer
Guided Response	Assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, manipulate, measure, mend, mix, organize, sketch, work
Mechanism	Assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, manipulate, measure, mend, mix, organize, sketch, work
Complex Overt Response	Assemble, build, calibrate, construct, dismantle, display, dissect, fasten, fix, grind, heat, manipulate, measure, mend, mix, organize, sketch, work
Adaptation	Adapt, alter, change, rearrange, reorganize, revise, vary
Origination	Arrange, combine, compose, construct, design, originate

(Adapted from Allen and Noel, 2002; Gronlund, 2000; Palomba and Banta, 1999; Roth, Beyer, and Gillmore, 2002; Designing Valuable Assessment Plans: Evaluating Assessment Strategies, 2003; and DLRN's Technology Resource Guide, 2003)

Guidelines for writing student learning outcome statements

Of Note

Be sure to frame the learning outcomes in terms of the program, rather than in terms of individual courses or students.

No requirements or restrictions are imposed on departments when developing outcome statements except that the learning outcomes should be aligned with the mission and goals of the university. However, there are some guidelines that you can use when writing student learning outcome statements. They are listed below and a brief explanation is provided.

1. **SLO statements should be aligned with mission statements (and goals if applicable).**
   The outcome statements should be derived from the goal statements (if goals have been defined) and clearly aligned with the program mission, which in turn, should be aligned with the university mission. You can refer to the UCF Mission and Goals web page for the University's Mission and Goal Statements.

2. **SLO statements should clearly indicate the level and type of competence that is required of graduates of a program.**
   The basis for assessment of student learning is learning outcome statements that **clearly indicate and define the learning outcomes**. Therefore, it is extremely important to correctly identify, develop and define the learning outcomes. The following information should be included in a well-defined learning outcome statement. Refer to the section on Types and Levels of Educational Objectives for a discussion on Bloom's taxonomy.

   - **Areas / fields** that are the focus of the assessment.
   - **Knowledge, abilities, values and attitudes** that a student in your program is expected to have within that area / field.
   - **Depth of the knowledge, abilities, values and attitudes** expected of a student in your program.

3. **SLO statements should be distinctive and specific.**
   It is constructive and beneficial to select outcomes that help **distinguish a graduate** of your program, and **highlight** what they have **gained** specifically from completing your program. Please note that although a distinctive outcome is recommended, it is not required. You can elect to choose a generic outcome. Examples of generic and distinctive outcomes are provided below:

   - **Example of a generic outcome:**
     Students completing the BSHE in Hypothetical Engineering will be practiced in design skills.

   - **Example of a distinctive outcome:**
     BSHE graduates will demonstrate knowledge of math, science, and engineering fundamentals. Specifically, the student will have the ability to: demonstrate general design principles; use fundamental engineering techniques, skills, and tools for engineering practice; analyze and interpret data to produce meaningful conclusions and recommendations.

4. **SLO statements should be framed in terms of the program.**
   Outcome statements should be framed in **terms of the program** and not individual courses or students.

- **Example of an outcome framed in terms of an individual course:**
  Students completing the XYZ course in Hypothetical Engineering will earn a B.

- **Example of an outcome framed in terms of the program:**
  Graduates from the BSHE program will demonstrate knowledge of engineering fundamentals.

5. SLO statements should be simple.

Useful outcome statements are **clear and simple declarative sentences**.

Of Note

> Do not join elements in one objective statement that cannot be assessed by a single assessment method.

Examples of "bundled" and simple outcome statements are provided below:

- **Example of a "bundled" statement:**
  BSHE graduates will demonstrate knowledge of math, science, and engineering fundamentals, and gain competency in such basic skills as writing reports, communicating research ideas and oral presentations.

  Note: This would likely require two different methods of assessment. Oral presentations would require a different approach than assessing knowledge of mathematics.

- **Example of a simple statement:**
  BSHE graduates will demonstrate knowledge of engineering fundamentals.

6. SLO statements should describe intended learning outcomes and not the actual outcomes.

Learning outcome statements should describe the abilities, knowledge, values and attitudes **expected of students** after completion of the program and **NOT the actual results**.

- **Example of an intended outcome:**
  BSHE graduates will demonstrate proficiency in XXX computer applications.

- **Example of an actual outcome:**
  BSHE graduates have demonstrated XX% proficiency in XXX computer applications.

7. SLO statements should focus on the learning result and not the learning process.

Despite the clear distinction between learning result and learning process, they are often confused in learning outcome statements. Learning outcome statements should be stated such that the focus is on the expected performance

of students in terms of their abilities, knowledge, values and attitudes (known as learning result or product), and NOT on the process of instruction and learning. In other words, the outcome statement should be stated from the student's perspective (client) and not from the provider's perspective.

- **Example of a statement focusing on learning process:**
  Introduction of computer applications.

  Note: The wording of this statement focuses attention on the teaching activity (which in this case is to introduce students to computer applications) and not on the intended outcome of the instruction. This is not a student learning outcome.

- **Example of a statement focusing on learning result or outcome:**
  Demonstrates proficiency in XXX computer applications.

  Note: The wording of this statement focuses attention on the intended learning result or outcome, that is, what is expected from a student. This is a student learning outcome.

8. SLO statements should be stated such that the outcome can be measured by more than one assessment method.

An outcome statement should not impose restrictions on the type or number of assessment methods that have to be used to evaluate the outcome. **At least two measures** should be identified for each learning outcome statement. Please refer to **Chapter 5** for a discussion of assessment methods.

- **Example of an outcome statement that can only be measured by one specific assessment method:**
  Students completing the Hypothetical Engineering program will score at least 95% on a locally-developed Engineering examination.

  Note: For this outcome statement only one measure can be used to evaluate the student's performance because this is what is specified in the statement.

- **Example of an outcome statement that can be measured by several assessment methods:**
  Students completing the Hypothetical Engineering program will demonstrate competence in the application engineering principles.

  Note: Specific assessment methods have not been identified in the outcome statement and thus several measures can be used to evaluate the knowledge that the students have gained as a result of the program.

(Adapted from Allen and Noel, 20002; Gronlund, 2000; Harding, Dickerson and Kehoe, 1999; Nichols, 1995; Randy, 2000; Guidelines for Program Assessment, 1993; and Selecting Means of Assessment for Program Improvement, 2003).

Of Note

Outcome statements should state the expected impact on a student's learning, development and growth explicitly. These expectations should be clearly articulated so that they are easily understood by an external audience (including students and their parents).

Refer to Appendix 4B for a checklist of guidelines for writing student learning outcome statements.

Review of steps for developing and assessing Student Learning Outcomes

- List outcome statements (derived from goal statement if available).
- Identify performance indicators for each student learning outcome (performance indictors or measures are a means of objectively quantifying the results of programs, products, projects, or services).
- Select the appropriate assessment methods that can be used effectively to evaluate the identified performance indicators for each intended outcome.

For a detailed discussion on assessment methods for measuring student learning outcomes and matching the method to the outcome, please refer to **Chapter 5**.

Two possible formats:

Format #1: To (action verb) (object) (target) (modifiers)

- Example: to obtain "very good" to "excellent" student ratings from 90% of the students on the quality of academic information provided by academic advisors

Format #2: The (target) (action verb) (modifiers) (object)

- Example: advisors will provide high quality academic information to students as evidenced by "very good" to "excellent" student ratings from 90% of the students

Example of identifying performance indicators for an outcome statement:

Student Learning Outcome:
Graduates will the role of an engineer involving ethics, professionalism, engineering practice and registration.

Performance Indicators (associated with particular measurement methods):

- Based on an employer survey conducted each summer, at least 75% of the employers will be satisfied with the ethical conduct and the knowledge of ethical standards and professional registration of our student graduates.
- In the Engineering Ethics sub-group of the FE examination administered twice every year, our students will equal or exceed the national average.

- Based on a student exit survey every term, at least 90% of our students will indicate that they were made aware of topics in professional ethics and registration.

Examples of learning outcome statements

Example 1:

Poor: Students completing the undergraduate program in Hypothetical Engineering will have knowledge of engineering principles.
This is a weak statement because it does not specify which engineering principles a graduate from the program should know. Also, it does not define what is meant by "have knowledge". Are they supposed to be able to simply define the principles, or be able to apply the principles, etc?

Better: Graduates will be competent in the principles of engineering design, formulating requirements and constraints, following an open-ended decision process involving tradeoffs, and completing a design addressing a hypothetical engineering need.

This statement is better because it lists the specific areas in hypothetical engineering that a student must be competent in. However, it is still vague, as the level of competency is not stated. Are they expected to understand these concepts and how will they apply them?

Best: Graduates will be able to apply and demonstrate the principles of engineering design, formulating requirements and constraints, following an open-ended decision process involving tradeoffs, and completing a design addressing a hypothetical engineering need.

This is a much better learning outcome statement for two reasons. First, the specific requirements are listed and second, the level of competency is also stated. A student must be able to apply and to demonstrate the listed engineering principles.

Example 2:

Poor: PhD students of Hypothetical Engineering will be successful in their research.

This statement is very vague and provides no indication of what "successful" means. It does not specify what type or quality of research skills is expected from the student.

Better: PhD students of Hypothetical Engineering will be successful in conducting high-quality research.

Although the quality of research expected from the doctoral students is identified, there is no indication of specific research capabilities that a student should possess. Therefore, even though it provides more detail than the previous statement, it is still lacking.

Best: Ph.D. graduates of Hypothetical Engineering will be able to conduct high-quality, doctoral research as evidenced by their results of experiments and projects, dissertations, publications, and technical presentations.

What is expected of a doctoral student in this program is clearly defined and stated, making this an effective learning outcome statement. The quality of research expected as well as the specific research requirements are articulated in the outcome statement.

(Adapted from Randy, 2000)

Example 3: (This example is taken from *A Program Guide for Outcomes Assessment* at Geneva College, April 2000):

Poor: Students should know the historically important systems of psychology.

This is poor because it says neither what systems nor what information about each system students should know. Are they supposed to know everything about them or just names? Should students be able recognize the names, recite the central ideas, or criticize the assumptions?

Better: Students should understand the psychoanalytic, Gestalt, behaviorist, humanistic, and cognitive approaches to psychology.

This is better because it says what theories students should know, but it still does not detail exactly what they should know about each theory, or how deeply they should understand whatever it is they should understand.

Best: Students should be able to recognize and articulate the foundational assumptions, central ideas, and dominant criticisms of the psychoanalytic, Gestalt, behaviorist, humanistic, and cognitive approaches to psychology.

This is the clearest and most specific statement of the three examples. It provides even beginning students an understandable and very specific target to aim for. It provides faculty with a reasonable standard against which they can compare actual student performance.

Example 4: (This example is taken from *A Program Guide for Outcomes Assessment* at Geneva College, April 2000):

Poor: Students should be able to independently design and carry out research.

The problem with this is that the statement does not specify the type or quality of research to be done.

Better: Students should be able to independently design and carry out experimental and correlational research.

This specifies the type of research, but not the quality students must achieve. If a student independently does any research that is experimental or correlational, it would be viewed as acceptable.

Best: Students should be able to independently design and carry out experimental and correlational research that yields valid results.

Here, the standard for students to aim for is clear and specific enough to help faculty agree about what students are expected to do. Therefore, they should be able to agree reasonably well about whether students have or have not achieved the objective. Even introductory students can understand the outcome statement, even if they don't know exactly what experimental and correlational research methods are.

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APPENDIX 4A
Summary of Guidelines for Developing Student Learning Outcomes

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

This is a summary of the guidelines that you should keep in mind when developing student learning outcomes for your program:

- ☐ Focus on **intended outcomes** that are **critical and specific** to your program.
- ☐ Include in clear and definite terms **the knowledge, abilities, values and attitudes** a student who graduates from your program is expected to have.
- ☐ Confirm that it is **possible to collect** accurate and reliable data for the outcome.
- ☐ Consider **available resources** when developing outcomes.
- ☐ Include **more than one measure** that can be used to demonstrate that the students in a particular program have achieved the expected outcomes of that program.
- ☐ Address how the students' experience in the program **contributed** to their knowledge, abilities, values and attitudes.
- ☐ State the outcome so that such that assessments of the outcome can be used to identify areas to improve.

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APPENDIX 4B
Checklist for Reviewing Student Learning Outcomes

College / School: _____

Program: _____

Academic Year: _____

Date Prepared: _____

Use the following checklist to ensure that your learning outcomes are adequately stated:

Do/Are the student learning outcome statements:

- ☐ Aligned to the mission (and goal) statements
- ☐ Indicate the level and type of competence that is required of graduates of a program
- ☐ Distinctive and specific to the program
- ☐ Framed in terms of the program rather than individual courses or individual students
- ☐ Simply stated so that outcomes requiring different assessment methods are not bundled into one statement
- ☐ Describe intended outcomes not actual outcomes
- ☐ Focus on the learning results, not the learning process
- ☐ Stated so that more than one measurement method could be used
- ☐ Measurable and there are available resources for measurement
- ☐ Useful to identify areas to improve
- ☐ Include concrete action verbs rather than passive verbs

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CHAPTER 5
ASSESSMENT METHODS

Purpose of this Chapter

By now you should have developed a strong assessment plan with clearly defined goals and intended outcome statements. The purpose of this chapter is to a discuss guidelines and criteria for selecting appropriate assessment methods. Additionally, an inventory of assessment methods and techniques that are currently available and can be developed or adapted to your program is presented. Each assessment method is described and, in some in some instances, a short list of advantages, disadvantages and considerations associated with each method is also presented.

KEY TOPICS	**The key topics presented in this chapter are:** ▪ Types of assessment methods ▪ Helpful hints when selecting assessment methods ▪ Guidelines for selecting assessment methods ▪ Curriculum mapping ▪ Inventory of assessment methods ▪ Sources

Of Note

OEAS supports the survey and statistical analysis needs of administrative and academic units and programs. These needs may relate to institutional effectiveness, assessment, accreditation processes, as well as other projects. We provide the following services:

- review, reformat, revise survey instruments programs and units already have implemented
- consult on the design of measurement strategies
- coordinate data collection for UCF institutional surveys
- assist programs who are designing program-specific questions for the Graduating Seniors Survey or the UCF Graduate Student Survey
- design and implement specialized surveys
- analyze results of UCF institutional surveys and specialized surveys
- prepare reports
- disseminate survey results
- assist in the interpretation of results
- conduct workshops on assessment and measurement topics

A Survey Design Workshop PowerPoint presentation is available on the OEAS website.

For further information and support please contact Dr. Pat Lancey, Survey Support and Statistical Studies, Operational Excellence and Assessment Support (OEAS)

Taxonomy of assessment methods (based on purpose of assessment)

Traditionally, assessment methods have been categorized as either direct or indirect. These two classifications are based on the distinction between assessing student learning outcomes (SLOs) and student experience. Direct assessors of learning specifically evaluate the competence of students in the program. Indirect assessors differ in that they are concerned with students' experiences, opinions, or perceptions, rather than their knowledge and skills. These two methods rely on feedback from diverse populations (e.g., internships, supervisors, student self-reports, etc.).
(Adapted from Concordia College)

Reasons for conducting assessment include, but are not limited to, improvement of 1) student learning, 2) the content of the curriculum, and 3) department processes. The classification scheme proposed in this handbook focuses on developing a clearly defined plan for selecting appropriate assessment methods. Assessment methods are classified in terms of what is being assessed.

Assessment methods classified based on the focus of the assessment

1. Student learning

    1.1. Direct assessors of student learning

        a. This category includes methods that evaluate student learning on the following levels:

            1.1.a.1. Cognitive skills: What does the student know?
            1.1.a.2. Performance skills: What can the student do?
            1.1.a.3. Affective skills: What does the student care about?

    1.2. Indirect assessors of student learning

        1.2.1 This category consists of assessment methods that allow students or others to report on what students have learned. In other words, the methods are used to evaluate the "perception" of student learning.

            1.2.1.1 Cognitive skills: What does the student report (perceive) that (s)he knows?

            1.2.1.2 Performance skills: What does the student report (perceive) that (s)he can do?
            1.2.2.2 Affective: What does the student report (perceive) as important?

2. Program and department processes

    2.1. Direct assessors of program and department processes

        2.1.1 This category pertains to methods used to assess academic activities and services related to student learning (e.g., advising,

computer assistance, tutoring).

2.1.2 Student perception of program and department processes

2.1.2.1 This category includes methods that assess students' perception of academic activities and services (such as advising, content and curriculum, teaching, readiness for graduate school and the workplace).

3. Curriculum

3.1. This area includes assessment methods used to monitor the alignment of the curriculum with intended learning outcomes. Curriculum mapping is effective when used to verify alignment of the curriculum with SLOs. Curriculum mapping ensures that the program's content is actually relevant to the specified intended learning outcomes.

SLO's	Course I	Course II	Course III	Course IV	Course Cluster I
SLO A1	I *classify*	**E** *design*			R *analyze*
SLO A2	I *define*			**E** *choose*	R *design*
SLO B1	I *predict*		**E** *examine*	R *evaluate*	
SLO B2		I *translate*	**E** *specify*	R *plan*	
SLO B3					

- **Example**
  - Outcome: Graduates will solve problems that address engineering economics issues such as life-cycle analysis and the selection of alternatives.
    - Assessment Method: The course in Introduction to Construction Engineering that follows the Engineering Economics course will be used to assess knowledge of economics once annually.

    Students will demonstrate proficiency by achieving a minimum grade of 80% on question(s) dealing with engineering economics.

Helpful hints for selecting assessment methods

Of Note

> "There is no more critical juncture in implementing a successful assessment of the major than the moment of methods selection."
>
> (Johnson, McCormick, Prus, and Rogers, 1993, pp. 153)

Developing your assessment plan and articulating the goals and learning outcomes of your plan can be a challenging and demanding process. Selecting the appropriate methods for assessment is an essential step to ensure the success of the assessment process. Some points to keep in mind are presented in this section.

Select assessment methods prudently and ensure that they are good assessors of the effectiveness of a program. A primary objective of assessment is to uncover issues that, when addressed, will lead to improvements. Complex measures are not the key to successful assessment. Instead, consider measures that provide data that are easily interpreted and are not ambiguous.

Choose assessment methods that will provide useful information. The intended outcome that is being assessed should allow one to make inferences about student progress. Assessing curricular requirements, the achievement of a goal, or the completion of an activity may not provide the type of evidence about student achievement, student support services or teaching practices that would provide opportunities for improvement.

- **Example** of assessment that will not provide useful, useable information:

    - Outcome: Students completing the Hypothetical Engineering program will demonstrate competence in conducting research.
    - Assessment method: 90% of all graduates will successfully complete the Senior Design project.

    Note: An element of Senior Design is that students complete a research project. Therefore, using the Senior Design project as an assessment of a student's ability to conduct research does not provide any new information. It would be more effective to develop a scoring rubric for the design project and, with the data from the rubric; one would be equipped to analyze components of the design project. The data could then be analyzed and areas of weakness may be identified. These weak areas would then become the focus for improvement.

The importance of matching the assessment method to the learning outcome cannot be over stated. Successful and useful assessment can be achieved only if you align the assessment method with the outcome that you are trying to assess.

- **Example** of an assessment method that does not match the learning outcome:

    - Outcome: Students completing the Hypothetical Engineering program will demonstrate competence in engineering principles comparable to graduates of other similar national programs.
    - Assessment method: In a locally-developed test, 95% students will achieve a score of 90.

    Note: When comparing graduates of a program to other graduates nationally, using locally developed test as the assessment method is not recommended.

- **Example** of an assessment method that matches the learning outcome:

    - Outcome: Students completing the Hypothetical Engineering program will demonstrate competence in engineering principles comparable to graduates of other similar national programs.
    - Assessment method: Students will equal or exceed the national average on the FE examination, administered twice a year.

    Note: A more appropriate assessment method to compare the achievements of your graduates to the national average is to use a national instrument.

- Determine beforehand if there are available resources to assist in the collection of data for a specific intended learning outcome. Do the data already exist or is a new data collection process going to be required? If new data needs to be collected, determine if the data are difficult or easy to obtain. Consider assessment methods for which data might already exist. The office of Institutional Research may have data that are useful. When possible, avoid selecting assessment methods that require complex data collection techniques. In some cases, it might be highly constructive to start with a pilot test and collect data from a small sample. This will help you determine if the scope of the data collection is feasible in terms of resources and time.

Select methods that provide information that can be directly controlled by the department or program. An assessment method that is influenced by external factors beyond the control of the program will yield results that may be meaningless because you may not be able to separate the impact of the department from the effects of those factors.

Multiple assessment measures are required for each intended learning outcome. Some benefits of using more than one method are that different components of one outcome can be assessed and a high level of accuracy and authority can be achieved. If a nationally normed measure or standardized test is used, a second measure is not usually required.

Strive to identify subcomponents of a measurement approach so that you will be able to conduct a deeper analysis. In other words, include questions on a survey that measure components of an outcome (e.g., components of the quality of advising). Specific questions on a questionnaire can assess several aspects of overall quality (e.g., timeliness, accuracy, completeness of information). When using a survey with a small population, it is desirable to target all of the group versus a sample. If you are unsure, contact OEAS for assistance.

The strengths and weaknesses of your program should be assessed. Select assessment methods accordingly. Exclusively assessing what already works will not provide you with the opportunity to implement changes that result in continuous improvement.

When possible, utilize a combination of qualitative and quantitative assessment methods to effectively assess learning outcomes. The selection of assessment methods should reflect the culture of the program. Each type of assessment method selected should be

one that provides decision makers with useful information. Examples of qualitative assessment methods include surveys, focus groups, exit interviews, case studies.

Utilize a combination of passive and active assessment methods. Some assessment methods require direct interaction with the students in an evaluative or instructional setting, while others do not (e.g., information from the student database or employer surveys).

Capstone courses and senior projects are an excellent method for directly assessing student learning. These methods promote interaction between faculty and students and "scholarly inquiry." Additionally, they provide the students an opportunity to demonstrate the ability of absorbing, applying and integrating experiences and knowledge.

When possible, use methods and techniques that you already use for accreditation. Use accreditation criteria as a basis for designing your assessment plan and selecting assessment methods.

Ensure that your assessment instruments are submitted to the Divisional Review Committee with your plan, via email if possible, for review purposes. If you need help in developing assessment instruments or wish to know more about existing instruments, contact OEAS.

(Adapted from Auburn University; Hatfield, 1999; PACT; UCF OEAS website and U.Mass. handbook)

Before you start developing the assessment plan

Of Note

> Identify existing information or processes that support assessment and are aligned with program mission, goal, and learning outcomes before developing new assessment instruments.

Before investing time and resources devising and developing new assessment instruments or methods, identify assessment processes already in place and assessment-related data that you are already collecting. It is very helpful to match available information and processes to the program goals and learning outcomes identified in chapters 3 and 4.

A useful tool that will help you link your current assessment efforts to program mission, goals and student learning outcomes is an assessment matrix. Note that faculty and departments may already be using various assessment methods to assess student learning but do not define them as part of the assessment process.

Assessment matrices can be used to link what you are doing with program goals and outcomes that you have identified as being important with your planned assessments. As an example, the matrix can link program objectives to specific courses and specific types of assessment, or it can link course objectives to program outcomes. Two examples of assessment matrices are presented.

In the first matrix, each assessment tool is categorized as being either direct or indirect depending upon whether the instruments are used to evaluate a student's abilities, skills, and knowledge of academic support services (direct methods) or to reflect on student learning or perception of academic activities (indirect methods).

Outcomes	Graduating Senior Survey	Capstone Course	Portfolio	Focus Group
Satisfaction with advising	Direct			Indirect
Acquire necessary skills and knowledge		Direct	Direct	Indirect
Proficiency in written communication skills		Direct	Direct	Indirect

Another configuration that can be used in the assessment matrix is to link intended program outcomes with the curriculum. List all the intended program outcomes vertically and the courses and program requirements horizontally. Then indicate which course addresses each listed outcome. Additionally, the matrix can be used to provide more detail such as the degree it was addressed in a particular course. For example, specify if the outcome was introduced, emphasized, used or assessed during each course.

Learning outcomes	Course 1234	Course 2345	Course 3456	Capstone Course
Apply specific theory	Introduced	Emphasized	Used	Assessed
Acquire necessary skills and knowledge		Introduced	Used	Assessed
Proficiency in written communication skills		Introduced	Assessed	Emphasized & Assessed

(Adapted from Diamond, 1998; Palomba and Banta, 1999; and U. Mass. Handbook)

Criteria for selecting assessment methods

Establishing and discussing criteria and characteristics of assessment methods can be very productive and valuable to the assessment process. Engage faculty in the discussion to ensure that the qualities they consider to be essential, as well as concerns they may have regarding the reliability and validity of the assessment methods, are considered. Palomba and Banta (1999) present a discussion of criteria significant for assessment in *Assessment Essentials.* These are summarized in this section.

1. Relationship to assessment

According to the Department of Education (1998), you should consider the ability of an assessment method to address specific assessment questions, as well as its relevance and utility. Make certain that the selected assessment method satisfy the objectives of the assessment questions. That is, the methods you choose should be able to provide you with information about what you are trying to assess. As an example, while surveys can be a great tool to assess students' perception of a certain process, they are not useful in determining students' knowledge or understanding of a subject.

2. Reliability

A reliable assessment method is one that yields consistent responses over time. The three sources of measurement error described by Cherry and Meyer (1993) include 1) the respondents, 2) the instrument (assessment method) and 3) the administration of the instrument. The method selected should be one that provides dependable, consistent results time after time. The instrument should not be unambiguous and should be clearly worded. The time available to complete the instrument should be consistent with its length. The instructions and time allocated for completion should be consistent across programs or departments.

3. Validity

Validity refers to determining whether the selected assessment method is appropriate for measuring what you want to measure. It is often a time-consuming and challenging task to provide evidence supporting the validity of the selected method. According to the Joint Committee on Standards for Educational Evaluation (1993), it is necessary to gather evidence to support the interpretation and appropriateness of a survey or test for a specific purpose. It is also recommended to use multiple data sources. Achieving high-quality assessment requires addressing issues identified by Linn and Baker (1996) and Herman, Aschbacher, and Winters (1992) such as:

- Does the selected method cover the curriculum objectives?
- Does it match the desired level of complexity?
- Can the results be generalized, and to what extent?
- Will we gain information that will be useful in improving programs?

Of Note

Measurement standards indicate that there is a trade-off between reliability and validity. The complexity of a task may increase validity but at the same time will decrease reliability due to a lack of standardization. The key is to select methods that effectively balance the two issues (Wiggins, 1993).

4. Timeliness and cost

The time and costs involved in assessing programs may be a concern for faculty and administrators. It is necessary to estimate the time required to develop, administer and evaluate various assessment methods. Angelo and Cross (1993) utilize a rating system of low, medium or high to help faculty select classroom assessment methods. Each method is evaluated on preparation time, students' response time, and analysis time. Each of these factors is given a rating. A similar approach can be used for program assessment methods. Also, evaluating the costs associated with administering assessment methods is imperative. Costs can range from opportunity costs (e.g., faculty working on assessment and not on teaching-related activities or research) to the tangible costs associated with the method (e.g., the financial cost of using and analyzing a nationally developed instrument).

5. Motivation

Assessment methods should be selected with a focus on whether or not they provide value to students and encourage their participation in the assessment effort. Course-embedded assessment methods are highly valuable because they take advantage of current classroom activities. When alumni and employers are the focus of assessment methods, one should select instruments that would elicit their participation without requiring them to come to campus (surveys, phone interviews).

6. Other

There are other considerations that are pertinent to selecting the appropriate assessment method. The following is a list of questions to consider:

- Will the instrument or method provide results that are easy to understand and interpret?
- Are the fluctuations in the results representative of changes in the program or something else?

(Adapted from Palomba and Banta, 1999).

Challenges to selecting assessment methods

Following are several challenges that may be encountered during the process of identifying and designing assessment methods.

Differences between programs within a department
Although several programs fall under one department, it is not necessarily realistic that the programs share the same goals and learning outcomes. Acknowledge these differences. Some assessment methods may work well for one program and be meaningless for another. When selecting assessment methods, ensure that they are appropriate for the specific outcome that you are assessing.

Time Constraints
When developing and using a new assessment method, start small and test it. That way if it turns out that it is not a meaningful assessment instrument you will have not wasted valuable time. For help with identifying and developing assessment methods, contact OEAS.

Feedback
Encourage faculty involvement and feedback by discussing assessment methods with them. Faculty involvement is critical to the success of assessment. Feedback can be through group or individual discussion, e-mail communication, or other means.

Matching the assessment method to the goal or intended outcome
Develop and write your program goals and intended outcome statements before selecting assessment methods. Do not develop an assessment instrument and then fit an intended outcome to it.
(Adapted from U. Mass. handbook)

Inventory of assessment methods

Of Note

Although many assessment methods have been included in the inventory, there are other methods that you may already be using or you may be considering other measures that have not been listed here. The purpose of this chapter is to provide you with a list of available methods, but you are not limited to using only these techniques. If you are currently utilizing or considering an assessment method not included in this chapter, please email OEAS. We are interested in compiling a list of assessment instruments being used at UCF. We may add yours to the inventory.

The following is an inventory of assessment methods, and although we have identified the major or most frequently used methods there may be others that you are using. A description, in addition to the advantages and disadvantages associated with each method is presented in this section.

1. Direct Assessment Methods

1.1. Curriculum / Course-Related Assessment Methods

1.1.1. Performance-Based
- 1.1.1.1. Capstone course assignments
- 1.1.1.2. Capstone projects
- 1.1.1.3. Case studies, hypothetical situation responses
- 1.1.1.4. Minute papers
- 1.1.1.5. Course-embedded questions
- 1.1.1.6. Portfolio assignments (standard across the program)
- 1.1.1.7. Assessment of papers, projects with standard rubric
- 1.1.1.8. Research papers

1.1.1.9. Performance appraisal of in class exercises
1.1.1.10. Expert evaluation

1.1.2. Other
1.1.2.1. Observations in class by evaluator who is not the teacher
1.1.2.2. Peer evaluation of practical skills using rubric
1.1.2.3. Clinical practice or internship skill assessment

1.2. Examinations and Tests

1.2.1. Standardized Examinations and Tests
1.2.1.1. National Test
1.2.1.2. State Test
1.2.2. Local Examinations and Tests
1.2.2.1. Local Tests
1.2.2.2. Pre-post test
1.2.2.3. Test-embedded questions (across several course sections)
1.2.3. Licensure Exams

2. Indirect Assessment Methods

2.1. Surveys

2.1.1. National Surveys
2.1.1.1. Institutional Level (administered by the institution)
2.1.1.1.1. Cooperative Institutional Research Program (CIRP)
2.1.1.1.2. College Student Expectations Questionnaire (CSXQ)
2.1.1.1.3. Institutional Priorities Survey
2.1.1.1.4. National Survey of Student Engagement (NSSE)
2.1.1.1.5. Student Satisfaction Inventory (SSI)
2.1.1.1.6. Your First College Year (YFCY)

2.1.2. Local Surveys (examples are those used at UCF)
2.1.2.1. Institutional Level
2.1.2.1.1. Alumni Surveys
2.1.2.1.2. Employer Surveys
2.1.2.1.3. First Destination Surveys
2.1.2.1.4. Graduating Seniors and Graduates Surveys
2.1.2.1.5. Non-Returning AA/AS Transfer Student Survey
2.1.2.1.6. Student Satisfaction Surveys
2.1.2.1.7. UCF's Incoming Freshmen Survey

2.1.2.2. Program or Department Level
2.1.2.2.1. Advisory Board Surveys
2.1.2.2.2. Alumni Surveys
2.1.2.2.3. Assessment Surveys
2.1.2.2.4. Customer Surveys
2.1.2.2.5. Employer Surveys
2.1.2.2.6. External Peer Review Surveys
2.1.2.2.7. Graduating Seniors and Graduate Students Program

Specific Survey Questions

2.1.2.3. Point of Service Surveys

2.1.2.4. Regional Campus Level
2.1.2.4.1. UCF Downtown and South Orlando Student Profile Survey
2.1.2.4.2. UCF Downtown and South Orlando Student Satisfaction Survey

2.2. Other Assessment Methods

Description of Direct Assessment Methods

Capstone Course Assignments or Projects

Capstone course assignments or projects can be useful tools for program-level assessment. The assessment of important program learning outcomes can be integrated into a capstone course or project. Assessments structured into the capstone experience can include one or more of the following: exams, integrative papers or projects, research projects, reflective essays, oral reports, surveys, and focus groups. Capstone courses or projects are typically discipline-based and may be designated as a "senior seminar" or an "assessment course". Graduates from a program demonstrate their competence in several areas and their ability to synthesize learning in the major with a product or performance. Projects are generally judged by a panel using pre-specified scoring rubrics for the purpose of identifying where to improve the program.

> **Example:** A panel of faculty members acts as evaluators of performances by music students, theatre students, etc., using a rubric that focuses on the important performance criteria and the quality of each. This method of assessment provides the student a chance to demonstrate the ability of absorbing and integrating their experiences and knowledge.

Advantages

- When capstone courses or projects are required, they can provide an ideal data collection opportunity because seniors are accessible.
- Assessments can provide an opportunity to motivate students through the curriculum. Also they can provide quality data that permit meaningful reflection on the program.
- Seniors are well into the curriculum and can reflect on their learning experience and the curriculum.
- These assessment methods provide seniors with an opportunity to provide meaningful feedback when they believe that their opinions are respected and valued.
- Students get feedback on their accomplishments and student responsibility is encouraged.
- They can be used for both student evaluation (assess seniors' overall ability and knowledge gained from the program) and program evaluation (annual, continuous evaluation of curriculum from student feedback).
- They support program coherence.

- They provide an opportunity to create a local assessment instruments that can be used in conjunction with other methods, such as surveys and standardized tests.
- Many faculty are engaged in planning the topics and the design of the capstone experience.
- This assessment allows flexible course content (i.e. adaptable to different courses).

Disadvantages

- Capstone surveys could yield invalid or misleading feedback, particularly when responses are not anonymous.
- Student performance may be impaired due to "high stakes" of the project.
- A faculty member may develop the idea that the capstone course or project should only involve him or her.
- Successfully completing the capstone course may be a requirement for graduation which may generate some anxiety for both faculty and students.

Considerations

- Ensure that the course assignments or projects accurately represent the major or program requirements.
- The use of checkpoints is recommended to prevent difficulties, especially towards the end, which may affect a student's graduation.
- Maintain the curriculum and evaluation of assignments across all sections.
- Ensure that students understand and value the importance of the capstone experience and take it seriously.
- Secure administrative support before implementing a capstone experience since there are usually high costs associated with it because of small class size required to maximize the faculty-student interaction.
- The capstone course or project can be designed to assess curriculum goals and outcomes.

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Classroom Assessment

Student learning begins in the classroom. Improved student performance cannot take place when there is no change in teaching and learning in the individual classroom. Changes in teaching techniques will have a much more immediate impact on student performance than changes to the curriculum or academic services.
Classroom assessment includes a variety of approaches that can be used to evaluate learning and learning processes. These include **minute papers, case studies and hypothetical situations, and simulations.**

Advantages

- Classroom assessments are formative in nature and are used to make changes to teaching and learning strategies while a course is being taught. This is a "just-in-time" form of assessment that leads to immediate change if needed.
- They can occur at multiple times throughout a class and results can be used to improve course content, methods of teaching, and ultimately, student learning.

Examples: http://www.fctl.ucf.edu/assessment/classroomassessment.html

Disadvantages

- Changes may be necessary and would require flexibility.
- Students may be hesitant to be involved in assessment process.

Considerations

- Students should be made aware of all formal assessments that will be used.

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Case Studies, Simulations and Hypothetical Situations

A case study is focused, systematic examination of one instance of a phenomenon such as an event, program, process or person. Typically, they involve collection of qualitative and quantitative data such as observations, surveys, and interviews for an in depth study of the phenomenon. Students can conduct case studies and/or respond to hypothetical situations.

Advantages

- Student work of both a quantitative and qualitative nature can be assessed,
- Useful when a student learning outcome is to comprehensively study and understand a phenomenon of particular interest to the field.
- Provides an opportunity for students to apply learned skills in context.

Disadvantages

- Tend to be expensive, labor-intensive, and time-consuming, which can be prohibitive within a course.

Considerations

- Single or multiple cases (collective case study) may be investigated.
- Different approaches may be used such as a highly structured approach or an unstructured process.

Content and Embedded Assessment Approaches

- **Course-embedded Questions and Assignments**

Course-embedded questions are predetermined questions that measure student learning in specific areas and can be used to assess students’ knowledge, skills, behavior and attitudes within a scheduled test. The test is typically a locally developed

test. Often instructors of a particular course use the same questions within their unique course tests at a particular point in the course (e.g., midterm or final). Growth in discipline-specific knowledge, skills or attitudes may be gauged using the same set of embedded questions in tests for different courses throughout the curriculum.

- **Portfolio Assignments**

A portfolio is a collection of samples of student work. The contents of these can vary widely, from a collection of photographs, to written assignments, to a collection of computer programs. Sometimes an electronic portfolio is used to facilitate storage and access of the samples of student work. A rubric may be used to evaluate a collection of students' work (e.g., writing, homework, etc.) over a period of time. This method of assessment can provide longitudinal data to gauge growth of particular skills or understandings, as well as an opportunity for student reflection. Typically, each assignment included in a portfolio has been reviewed and graded. A committee or a designated group of faculty members may review portfolios in a program for the purpose of identifying where improvements in the program are needed.

- **Assessment of Papers, Projects with Standard Scoring Rubrics**

A rubric is an assessment tool that can be used to specify scoring criteria for a paper, project, performance or other method of assessment. Usually all of the key elements of an assignment and their weighting on the total score are identified. A rubric is most effective when it is shared with students prior to the start of an assessment assignment. For more information on developing rubrics, see http://rubistar.4teachers.org/index.php

- **Research Paper**

This is an assessment method which can be used to evaluate students' abilities to analyze, synthesize, and/or evaluate information that has been taught. A scoring rubric makes evaluation criteria clear when assessing research papers. On the program assessment level it could be part of a capstone project or a tool used in the senior year to determine if students have achieved programmatic learning outcomes.

- **Essays**

Essays may be designed to measure specific learning outcomes, e.g. writing skills, appreciation for art, appreciation of diversity, etc. These essays are scored using rubrics established by a panel of faculty. The rubrics may be reviewed for the purpose of identifying elements needing more emphasis in the academic program.

- **Direct Observation by Instructor, Expert Evaluators**

A panel of individuals or an expert (e.g., supervisor) can score students' performance in practice (e.g., music, communications, clinical). The panel may include members of the faculty, advisory board members, experts in the field, etc. Scoring rubrics are often used to improve inter-rater reliability.

- **Direct Observation by Peer**

In class exercises can be assessed by peers or peer panels using scoring rubrics. This provides a first hand familiarity of criteria on the actual rubrics that will be used to assess future work. Students can use rubrics to assess examples of work not produced by classmates (e.g., use of a rubric to assess a videotaped speech for specific elements of speech).

Examinations and Tests

- **Standardized Examinations and Tests**

National Test

Exams available nationally with standardized scores and sub-scores can be used to determine where to improve the program.

Examples: Educational Testing Service (ETS) Field Exams, Psychology Area Concentration Achievement Test (PACAT), The Chauncey Group DANTE (Statistics Exam).

State Test

Exams available within the State of Florida with standardized scores and sub-scores that can be used to determine where to improve the program.

Examples: Florida Certification Exam in School Psychology, Florida Educational Leadership Exam, Florida Teacher Certification Exam

- **Local Examinations and Tests**

Local Tests

Exams are designed by members of an academic program or administrative program to measure student achievement of specific learning outcomes. The assessment purpose of these tests may be to identify where improvement is needed within the academic or administrative program.

Pre-post Test

These are a type of locally developed tests administered before and after a specified learning experience to measure students' level of knowledge, skills, behaviors and attitudes. (The learning experience can be a program, course, or unit.) Post-test scores are compared to pretest scores to determine if the students have learned specific information or concepts.

- **Certification and Licensure Exam**

Certain disciplines (especially in the health related disciplines) require that students pass specified certifications and licensure exams. Students' performance on these exams and their sub scores, when available, are a source of data that can be used to assess student learning.

Description of Indirect Assessment Methods

Surveys

Institutional Level

This category includes locally and nationally developed surveys that focus on evaluating satisfaction with academic programs and service experience, perceived learning outcomes, plans for further education and employment, further education, and/or employment placement and plans of undergraduate and graduating undergraduate and graduate students.

Advantages

- Surveys can be an important tool in understanding student's academic needs and their perception of their educational experience. Additionally, surveys can be used to determine students' satisfaction with the services offered at the university as well as program-specific services such as advising, etc.

Disadvantages

- Surveys are used to gather data regarding the perceptions of individuals about personal experiences. In most instances, this method does not provide direct evidence of knowledge, skills and abilities. When this method of assessment is implemented a direct measurement approach should be used as well.

Considerations

- Careful planning is critical for developing and administering institutional level surveys is critical for success. All stakeholders should be included.
- Institutional level surveys have budget implications that should be carefully considered.

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Other Indirect Assessment Methods

Focus Group
Individuals that are users of the program or that benefit from the academic preparation made possible as a result of completing the program (e.g., employers, alumni, faculty, parents, etc.) can provide important qualitative data that can be used to identify strengths and weaknesses within the program.

Advisory Committee
Individuals who are experts in the field can assess student preparedness and curriculum content. This method of assessment provides a current and relevant level of analysis which is beneficial to the development of the curriculum as well as the assessment of students' knowledge, skills and attitudes.

Structured Interview
One-on-one structured interviews with students, faculty, employers and alumni conducted by a trained interviewer can provide useful information. This information can be used to identify strengths and weaknesses within the program.

Student Activity and Study Log
A log that reflects the amount of time a student spends studying or involved in specific activities can provide important data that can be used to identify opportunities for improvement. This can be managed electronically in a spreadsheet by individuals and combined into a group for assessment purposes.

Institutional Data
Institutional level data such as retention rates, graduation rates, demographics, time-to-graduation and enrollment in graduate level programs by former graduates can provide useful information regarding the strengths and weaknesses of a program.

CHAPTER 6
USE OF RESULTS

Purpose of this Chapter

At this point, you have developed a strong assessment plan with clearly defined goals and intended learning outcome statements. You also have determined how you will measure each of those outcomes. The final task in good program assessment is "closing the loop." This is the *act* step in the plan-do-check-act cycle. The purpose of this chapter is to assist you in this final step. You will analyze your assessment results and develop recommendations. Finally, you will develop an action plan.

KEY TOPICS	**The key topics presented in this Chapter are:** ▪ Reviewing and interpreting your collected data ▪ Determining which evidence is most relevant for your stated intended learning outcomes ▪ Guidelines for developing recommendations ▪ Implementation of changes ▪ Reviewing new data and comparing the results ▪ Publishing the assessment story ▪ Sources

Chapter learning outcomes

Readers of this chapter will have the ability to:

- interpret assessment results
- evaluate the match between results obtained to stated intended learning outcomes
- develop recommendations after data analysis
- develop strategies for implementing change
- determine when new assessment methods should be used
- articulate a process for monitoring implementation of change(s)
- use assessment data to inform the development of a subsequent assessment plan

Reviewing and Interpreting Assessment Evidence

Review all of the information obtained from the assessment process and determine how this analysis will affect your next assessment plan. This concludes the first cycle and initiates the next step in the plan-do-check-act cycle for continuous improvement of the academic program.

Before investing time and resources devising and developing new assessment instruments or methods, identify assessment-related information that you are already collecting and assessment processes that are in place. It is very helpful to match the available information and processes to the program goals and learning outcomes identified in Chapters 3 and 4.

A useful tool that will help you link your current assessment efforts to program mission, goals and student learning outcomes is the assessment matrix. Note that faculty and departments may already be using various assessment methodologies to assess student learning, but do not include those methods as part of the formal assessment process.

Assessment matrices can be used to identify various configurations of how you are matching program goals with outcomes. For example, a matrix may link program objectives to specific courses; or course objectives to intended learning outcomes. Two examples of assessment matrices are presented below.

In the first matrix, each assessment tool is categorized as either direct or indirect. The instrument is categorized as a direct tool if it is used to evaluate a student's abilities, skills, and knowledge of academic services. It is termed an indirect method if it is used to gather data on how students perceived their educational experiences and what they have learned.

Outcomes	Graduating Senior Survey	Capstone Course	Portfolio	Focus Group
Satisfaction with advising	Direct			Indirect
Acquire necessary skills and knowledge	Indirect	Direct	Direct	Indirect
Proficiency in written communication skills		Direct	Direct	Indirect

Another configuration that can be used in the assessment matrix is to link intended program outcomes with the curriculum. List all the intended program outcomes vertically and the courses and program requirements horizontally. Then indicate which course addresses each listed outcome. Additionally, the matrix can be used to provide more detail (e.g., the degree it was addressed in a particular course). For example, you might specify if the outcome is introduced, emphasized, reinforced or assessed during each course.

Learning outcomes	Course 1234	Course 2345	Course 3456	Capstone Course
Apply specific theory	Introduced	Emphasized	Reinforced	Assessed
Acquire necessary skills and knowledge		Introduced	Reinforced	Assessed
Proficiency in written communication skills		Introduced		Emphasized

(Adapted from Diamond, 1998; Palomba and Banta, 1999; and U. Mass. Handbook)

Summarizing Collected Evidence

The evidence collected from your assessment methods should be summarized clearly and concisely.

Collected data categorized based on what is being assessed
If you have assessed intended learning outcomes clearly, you can organize your results into categories that both match your outcome and allow you to identify areas for change, such as student learning, program processes, and curriculum. In each category, review and summarize the data from each assessment approach per outcome.

Student learning
Data from measures associated with student learning outcomes permit you to compare actual student performance with intended student performance. You will then be able to identify areas of strength and weakness for students. Determining weak areas allows a program to target those areas for improvement. Faculty can be certain that the knowledge, skills, or values that are intended are adequately addressed in the courses students take as they progress through the program (see matrix above).

- **Use of data from direct assessments**
    - **Cognitive**: What does the student know versus what the program intends the student to know?
    - **Performance and skills**: What can the student do versus what the program expects the student to be able to do?
    - **Affective:** What does the student care about versus what the program intends the student to care about?
- **Use of data from indirect assessments**
    - **Cognitive**: What does the student report that he knows (i.e. his perception of his knowledge, understanding, etc.)? Does it match what you planned students' perception to be of the discipline or a specific aspect of the discipline?
        - **Performance and skills**: What does the student report that he can do (i.e., his perception of his ability or skills)? Does it match what you intended students in your program to do?
        - **Affective**: How does the student respond to questions dealing with program impact on the student's values? Does it match your intended values and beliefs?

Program and department processes
Data from measures associated with processes related to the department and the program provide information that can be used to improve how the program is functioning and what it has been done to facilitate students' progress toward graduation.

- **Use of data from direct assessors of program and department processes**. Collected data from measures for academic administrative support services, enable departments to improve areas of support (e.g., advising, computer assistance, tutoring).

- **Use of data from indirect assessors (student perception) of program and department processes**. Data collected about how students perceive support services administered by academic support departments enable areas to identify weaknesses (e.g., advising, curriculum, teaching, preparing for graduate school).

- **Curriculum** The data from curriculum assessment can be used to check the alignment of the curriculum with learning outcomes (such as curriculum mapping). Assessment mapping can be done as an extension of curriculum mapping to determine within which courses specific learning outcomes are assessed.

    - **Use of data to evaluate curriculum mapping.** When using data to inform curriculum mapping, compare the results with your curriculum map to determine if student learning outcomes were addressed. If they were not addressed, determine in which courses they should be.

    - **Use of data to evaluate assessment mapping**. Your data may reveal that you were not assessing outcomes in the right way or at the right time in the curriculum. Assessment mapping allows faculty to ensure that curricular student learning outcomes are being assessed well and at the optimum time(s).

(Adapted from PACT and U. Mass. handbooks)

All data analysis should be reviewed by a group of faculty to determine what the data mean. Interpretation of data should be within the context of what you plan to know after conducting assessment(s).

Summary of types of changes made as a result of conducting assessment

The following categories are areas, within the academic environment, where changes may be implemented:

- **Changes to Assessment Plan**

    - revision of intended learning outcome statement(s)
    - revision of measurement approaches
    - collection of and analysis of additional data and information
    - changes of data collection methods

- **Changes to Curriculum**

    - changes in pedagogical practices

- revision or enforcement of prerequisites
- revision of course sequence
- revision of course content
- addition of course(s)
- deletion of course(s)

- **Changes to Academic Processes**

  - modification of frequency or schedule of course offerings
  - improvements of technology
  - changes in personnel
  - implement additional training
  - other implemented or planned change
  - revision of advising standards or processes
  - revision of admission criteria

Developing Recommendations for Change

The intent of assessment is to identify weaknesses and then to implement changes in an effort to improve the program. These changes could impact a number of aspects of the program: curriculum, staffing, facilities, internal processes, and intended student learning outcomes.

Of Note

> In some instances, the data collected might not helpful for developing recommendations and action plans. In these cases, re-examine the assessment methods to determine if you have chosen appropriate methods (see Chapter 5: Assessment Methods).

Develop plan to monitor changes and compare current data with previous years' data

At this point in the continuous improvement cycle, the planned changes should be implemented. In some cases, the changes are easy to implement, while in other instances, the proposed changes will have to be implemented over a period of time or through a series of steps.

The implemented changes should be monitored to determine whether or not the changes made have the desired effect(s). One way of achieving this is to use the same assessment plan as used in the previous cycle and compare the actual data to the intended data. Any gaps should be studied carefully to determine the underlying cause.

In situations, the outcomes have been met, the action might be to continue monitoring the outcome to ensure quality. Alternatively, you can define another outcome to assess. Recall from Chapter 5 that the steps in selecting an assessment method are:

- Select assessment methods prudently and make sure that they are good **assessors of effectiveness** of the program. A primary objective of assessment is to uncover issues that, when addressed, will lead to improvements in student learning. Complex measures are not necessarily the key to successful assessment. Instead consider measures that provide you with information that is easily interpreted and unambiguous and that can be used to improve student learning, where necessary. Using elaborate methods that do not provide suggestions on learning improvement is a waste of time and resources.

- Determine beforehand if there are **available resources** to assist in the collection of data on the chosen measure. Does the data exist or is the collection of data going to be required. If so, determine whether the data are difficult or easy to obtain. Consider assessment methods for which data might already exist. The office of Institutional Research may have information that may be useful for your assessment plan. Avoid selecting assessment methods that require complex data collection techniques, when possible. In some cases, it might be highly constructive to start with a pilot test and collect data from a small sample. This will help you determine if the scope of the data collection is feasible in terms of resources and time.

- Select methods that provide information that can be **directly controlled** by the department or program. An assessment method that is influenced by external factors beyond the control of the program will yield data that are meaningless to you since you will not be able to impact that aspect of the student learning process.

- **Multiple assessment measures or triangulation** are required for each learning outcome. The use of multiple methods provides richer data and benefits students, faculty and other stakeholders in the following ways: 1) different components of one outcome can be assessed, and 2) an acceptable level of accuracy and authority can be achieved. If a nationally normed measure or standardized test is used a second measure is not normally required. Consider using both **qualitative and quantitative** assessment methods**.**

- The **strengths and weaknesses** of your program assessment should be evaluated. The intended learning outcomes and the assessment methods should be reviewed for appropriateness. The intended outcomes should clearly support the mission of the program and the measures that are selected to assess the outcomes should be suitable for the outcome (e.g. surveys to assess student satisfaction, portfolios to assess students' writing ability).

- Ensure that the assessment method is **reliable and valid.** A reliable assessment method is one that yields consistent responses over time. A valid assessment method is one that measures what it is supposed to measure, with minimum interference from other variables.

- Determine when the changes made will be assessed. **Timeliness** is central to meaningful assessment.

Of Note

OEAS supports the survey and statistical analysis needs of administrative and academic units and programs. These needs may relate to the overall institutional effectiveness process including 1) continuous quality improvement assessment, program and institutional level accreditation, program review, and other special studies. OEAS provides the following related support services:

- review, reformat and revise survey instruments programs and units may have in place
- consult on the design of measurement strategies
- assist programs that are designing program-specific questions for the Graduating Seniors Survey or the UCF Graduating Graduate Student Survey
- analyze results of data collection efforts
- assist in the interpretation of results
- conduct workshops on assessment and measurement topics.

A Survey Design Workshop PowerPoint presentation is available on the OEAS website.

For further information and support please contact Dr. Pat Lancey, Survey Support and Statistical Studies, Operational Excellence and Assessment Support (OEAS) or click here, Assistance Request, to fill out a request.

Releasing results of assessment

Selecting reporting methods

Consider who all of the stakeholders are when developing reports based on collected data. Individuals often involved in program assessment include university leaders, faculty, students, parents, accrediting bodies and the community at large. Discuss which data are relevant to each group. Consider the most effective approach to disseminating the results of assessment to each group. A few options are presented below.

- **Executive summary**
  - The executive summary can be used to provide a summary of the assessment activity that has taken place within a college and/or for an academic program. Specific accounts of assessment of a special support service or an intended learning outcome can be summarized in the executive summary. The details of the assessment can be outlined in the subsequent pages of the document.

- **Presentation**
    - An oral presentation may be appropriate for various entities that have a stake in assessment in the college setting. Examples of the types of presentations include 1) a formal annual report to the president and board of trustees, 2) a formal report to the board of trustees, 3) a less formal presentation to the deans and chairs and 4) a less formal presentation to program faculty.

- **Newspaper**
    - Findings from assessment, implemented changes and the impact of the changes can be reported to a larger community in the institution's newspaper. If the assessment story is significant and of importance to the community at large, it might be summarized in the local newspapers.

- **Websites**

    - Consider publishing the results of assessment, in an organized manner, via institutionally supported websites. Structure the web site to meet the needs of a specific group of stakeholders (e.g., accrediting bodies may find it convenient to view processes and findings via an assessment website).

APPENDIX 6A

Example of Assessment Mapping

Learning outcomes	Course 1234	Course 2345	Course 3456	Capstone Course
Apply specific theory	Pretest	Embedded Questions	Project	Posttest
Acquire necessary skills and knowledge	Knowledge Pretest	Skills Pretest	Practical Assessment	Team Project
Proficiency in written communication skills	Paper			Comprehensive Paper

(Adapted from Diamond, 1998; Palomba and Banta, 1999; and UMass Handbook)

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