Texas A&M University-Central Texas
Program-Level Assessment Reference Manual

Office of Institutional Research and Assessment

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An Outline of Roles and Responsibilities

All faculty and staff should be involved at some level in the assessment and improvement of the programs they support.

Who	What	When
Program Faculty and Department Heads	Review and revise mission, outcomes, and curriculum maps	Every September
	Create assessment plans	Every September
	Evaluate data and state how well students are achieving expected outcomes and make recommends on how to improve the program	Every September
	Create improvement plans	Every October
	Provide updates or demonstrate effectiveness on improvement plans	Every February

Assessment as a Function of Institutional Effectiveness

"Excellence and Achievement," a core value of the university, means that we strive to improve, innovate, and exceed expectations continuously. We ensure we have the highest quality academic and administrative programs through a process called program assessment. This vital part of the Institutional Effectiveness Model serves to ensure the fulfillment of the university mission through achieving the goals in the *University's Strategic Plan*. At the operational level, program faculty identify the expected outcomes of programs and map those outcomes to the strategic plan goals. The institutional effectiveness process at Texas A&M University-Central Texas helps to prioritize the use of the limited resources of a growing university.

The university employs a four-phased approach to program assessment by completing a comprehensive assessment of each program every ten years, a university-level assessment of students' achievement of general education outcomes each year, a program-level assessment of student learning outcomes each year, and a course-level assessment of student perception of learning each semester. The focus of each of these phases is to identify measures of improvement and not to evaluate any one person or group of people. Performance evaluations are completed by deans and department chairs on an ongoing basis using different instruments.

Texas A&M University-Central Texas is committed to the continuous improvement of all programs (academic and administrative) through intentional identification and assessment of outcomes and careful reflection on the attainment of desired outcomes. The process defined in this manual provides evidence of success and encourages improvement. The intent is to engage in a relatively simple process while promoting the thoughtful discussion and planning necessary to improve and attain quality measures. Our regional and programmatic accreditors require academic and administrative programs to identify clear and measurable outcomes. Assessment of the achievement of outcomes provides evidence of success and indicates areas in need of improvement. Ultimately, an assessment of outcomes can maximize the potential of all programs.

This manual serves as a reference for faculty and administrators in developing, revising, and assessing expected outcomes for degree programs. This manual provides essential information related to (1) program-level student learning outcomes, (2) assessing program-level student learning outcomes, and (3) using assessment data to make improvements to degree programs.

The following pages define the development, implementation, and revision of assessment at the program level. Contact the Office of Institutional Research and Assessment for assistance or consultation in the development of program-level assessment plans.

Expected Outcomes for this Handbook

Upon review of this manual, readers will be able to:

- Develop and revise expected student learning outcomes for a degree program
- Select appropriate assessment methods for each student learning outcome
- Establish benchmarks or thresholds for student performance about student learning outcomes
- Create and update an assessment plan that outlines the specific methods to be used to assess expected student learning outcomes for a degree program
- Identify ways degree programs use assessment data to make improvements to student learning
- Integrate the three phases of assessment (planning, assessing, and improving) into a departmental assessment plan
- Outline assessment plans with activities, responsible persons, and a schedule

The Process
Who

Program faculty and staff facilitate discussions to gain collective input to create and assess appropriate, measurable student learning outcomes as well as administrative outcomes for each program.

When

The deadline for the submission of revised student learning and administrative outcomes and measures for each academic year is Mid-October. Each spring semester, program leads provide updates to improvement plans.

What

The combination of a degree and a major define educational programs for outcomes assessment. Faculty are expected to identify and measure outcomes of standalone certificates and programs. Program leads facilitate the following activities with program faculty and staff each year. The groups should develop a comprehensive assessment plan to include a program mission, outcomes, curriculum map (for academic programs), direct and indirect measures for each outcome, targets or benchmarks for each measure, and potential strategies to correct deficiencies identified with each measure. The document will serve as a guide as programs move through the assessment cycle.

> **In the process of improving, quality programs ideally focus their efforts to assessing one-third of the program outcomes each year, including at least three year's data for each measure, and limiting active improvement plans to one or two at any time.**

Mission

A mission statement defines the purpose of the program. For example, "The [program name] [primary purpose] by providing [primary functions] to [stakeholders] in support of the department's, college's, and university's missions."

Program leads discuss the mission and overall intent of the program using the following criteria

- **Short**: Mission is brief and memorable, generally one or two sentences
- **Distinctive**: Mission is unique and distinguished from the other assessment areas at the university
- **Focus**: The mission states the program's purpose or why it exists
- **Scope**: Mission indicates the program's primary functions or how it works to accomplish its mission
- **Stakeholders**: Mission identifies those intended to benefit from the area's efforts
- **Alignment**: Mission supports the department, college, and university missions

Learning Goals

> **Learning goals are optional in the university assessment framework, but may be required for some discipline-specific accreditations.**

A learning goal is a broad statement of competence. It is a general statement about the intended outcome. Its purpose is to provide an overall direction to learning and help keep instruction focused on the targeted content.

A learning goal is an achievable result, but not necessarily measurable or observable. For example, it may be to "understand" how something works. It is often difficult to measure or observe a person's "understanding" of something. The goal states the overall intent or purpose of the learning.

Program goals flow from the mission and provide the framework for determining the more specific program learning outcomes. Goals describe overarching expectations such as "Students will develop effective written communication skills." or "Students will understand the methods of science."

Programs ideally would have three to six program goal statements mainly to bridge the lofty language of the mission statement and the concrete-specific language of program outcomes. These statements become a blueprint for implementing the mission by answering the following questions:

- How do program goals relate to the program mission?
- How does this program fit into a student's overall development?
- What general categories of knowledge and abilities distinguish the program graduates?
- For each principle of the mission, what are the critical competency categories graduates of the program should know or be able to do?

Outcomes

Outcomes define the specific values students, faculty, staff, and the community members receive from the program. Outcomes start with an action verb and include a noun to identify the key values of the program. A program should include between three (3) and six (6) outcomes. Outcomes do not include any strategies or actions that program staff will perform to improve outcomes. For example, "Provide a positive customer experience."

Program leads facilitate a conversation with program faculty and staff to identify three to five measurable outcomes consistent with the mission and overall goals of the program using the following criteria. For academic programs, student-learning outcomes would ideally reflect higher levels of the cognitive, psychomotor, and affective learning domains.

- **Measurable**: The outcomes are assessable, realistic, and not aspirational
- **Appropriate**: The outcomes are appropriate for the program
- **Time-Bound**: The outcomes state when the value will be imparted
- **Active**: The outcomes begin with a clear action verb, avoiding vague verbs
- **Defined**: The outcomes include nouns defining the value

- **Critical**: The outcomes are important conditions towards achieving the mission and refer to values
- **Comprehensive**: The outcomes cover all aspects of the program mission
- **Aligned**: The outcomes are mapped to the University's Strategic Plan

Assessment Plans

Each year, programs plan to assess at least one-third of the program's outcomes at the beginning of the academic year by identifying two methods of measurement for each outcome; at least one direct and one indirect method. Multiple methods of measurement are necessary to assure reliability and validity. Program faculty and staff determine progress on the outcomes using measures and ideally objectively quantify or qualify the achievement of program outcomes in support of the mission. Assessors should collect at least three years of data before introducing new measures. Measures in the operational plan should have the following attributes:

- **Quantity**: The plan should rotate the outcomes assessed, ideally one-third at a time so that all the outcomes are assessed in three years
- **Direct Measures**: The outcomes include at least one direct measure or evidence that is tangible, visible, and self-explanatory
- **Indirect Measures**: The outcomes include at least one indirect measure (or supporting evidence that is less tangible, visible, and self-explanatory)
- **Defined**: The measures include a clear and detailed explanation of the assessment tool and a procedure for implementation or a rubric
- **Appropriate**: The measures are appropriately designed for the outcomes
- **Timely**: The measures identify when the data will be available
- **Benchmark**: The measures include targets in the form of a percentage of the population achieving the cut score versus an average of the results
- **Feasibility**: Measures are likely to yield results capable of identifying opportunities for program improvements
- **Accountability**: Measures identify the person by title who is responsible for coordinating data collection and rating
- **Basis**: The targets include a justification for the population percentage and the cut score and explain how the targets are appropriately challenging for the available resources

Notes:

- Selecting proper measures is critical to getting value out of the assessment. The process will serve no purpose if it only returns results for measures that reflect positively on the program. Be sure to select measures that have the potential to identify areas for improvement.
- For each method of measurement, determine the acceptable level or standard of performance by answering the following questions:
  - What level of achievement is considered acceptable performance for graduates of the program?

- Are the acceptable levels consistent with any external review standards?
- Are acceptable levels clearly and accurately defined?
- For each method of measurement, develop a system for implementation and assessment by answering the following questions:
  - How and where are concepts, skills, and values being taught?
  - Will the measure effectively measure how individual student learning is being taught?
  - How will measures be evaluated, and what scoring rubrics will be needed to quantify student learning?
  - Who will be involved in the measurement process?
  - When will learning be measured?

Assessment Findings

Collect and analyze the assessment data. Draft a narrative defining the data, evaluating the results in relation to the outcome for each measure, and the other measures included for each outcome. The narrative should include enough detail to define the data so that it stands on its own, and uses attachments only as support evidence (not as documentation). Critically examine the findings and define actions needed (recommendations) to improve the program. Recommend actions based on the data. The narrative should include each of the following criteria:

- **Data**: a complete narrative of the assessment data with the population number (n=x) along with the percentage assessed (i.e., 4 out of 5 or 80% of students assessed). Attachments are included as appropriate
- **Evaluation**: a narrative critically evaluating the assessment results in relation to the outcome for each measure and the other measures included for an outcome
- **Result**: a declaration that the target was met, not met, or exceeded. Exceeded is used only if the results are 50 percent above the target
- **Next Steps**: a recommendation for each action proposed to improve the program or the assessments based on the assessment results, regardless of meeting the target

Notes:

- The narrative should consider how the findings amassed from the corresponding measure relate to the outcome
- The results should be based on reliable and valid data
- Data should reflect learning related to the outcome in all sections of the course offered throughout the collection period. If presenting three years of data, identify whether or not the data were collected from face-to-face and online, local campus and remote campus, and full-time, and adjunct faculty taught sections. The data do not have to disaggregated by modality and location, but data from each modality and location must be included in measurements; excluding any of these groups is improper. Moreover, while not required, it can be beneficial to compare the results for each of these types.
- Results should focus on student accomplishments and success

- Results indicate improvement from previous years
- Results illustrate the effectiveness of previous actions plans
- Results indicate success in achieving the desired performance target
- Indicators for improvement can be gleaned from the results
- Recommendations provided through previous assessments were addressed

Continuous Improvement Plans

> **Improvement plans are the purpose of assessment.**

The continuous improvement plan (CIP) defines strategies linked to findings and selected to improve the results for specified measures with the intent of improving program outcomes. While assessment plans and findings end at the close of each cycle, **CIP action items may continue for years** until actions are fully implemented, and evidence is collected to show the actions' impact on the program. Based on assessment findings, develop an action plan to address the following criteria:

- **Defined**: Actions include a clear title and a narrative that adequately defines the actions, describing how, when, and where the actions will be executed. Attachments are included where appropriate
- **Achievable**: Actions include criteria to determine how the actions will be considered complete
- **Resources**: Actions include a narrative indicating the resources needed to complete the actions, including both incremental and existing funding and labor required
- **Budget**: Actions include the dollar amounts for incremental budget requests
- **Evidence-Based**: Actions are associated with findings directly impacted by the defined actions

Notes:

- Actions should **likely lead** to continuous improvement
- Actions should **focus** on means to **improve** student learning and administrative effectiveness
- Actions should be **feasible** considering available **resources** and time

CIP Update

Good action plans require years to design, implement, and demonstrate improvement. Each fall semester, programs complete the other steps of the assessment process; but in the spring, program coordinators provide status or updates on the active action plans. In most cases, the actions are ongoing, and the coordinator needs to state the actions taken in the past year and those that will be taken in the upcoming year. Once the action is complete, and the data are available to determine the action's success, indicate the action is complete and provide a narrative of the improvement, including the following:

- The implemented improvement
- The outcome improved
- A detailed explanation of the actions taken

- An evaluation of how the data indicate the level of success of the action and the improvement
- A summary of the data that determined the action resulting in an improvement (or not).
- Attachments when appropriate (however, the narrative should stand on its own)

Notes:
- Be sure to describe the evidence of improvements gained from actions taken based on previous outcomes assessments
- Evidence of improvement should focus on improvements in student learning and administrative actions
- Evidence of improvement should be found in the results

Curriculum Maps

Academic programs state expected learning outcomes and map those outcomes to the courses defined in the degree requirements published in the University Catalog. Each course is identified as introducing, practicing, or reinforcing an outcome or group of outcomes. Each program outcome should be associated with a course, and each course should be associated with an outcome. Only prescribed courses are required to be associated with program-level outcomes. However, more detailed curriculum maps are encouraged.

Example Curriculum Map

	PLO 1	PLO 2	PLO 3

Course 1
  CLO 1
  CLO 2
  CLO 3
	Introduced		

Course 2
  CLO 1
  CLO 2
  CLO 3
		Introduced	

Course 3
  CLO 1
  CLO 2
	Practiced	Practiced	Introduced

Course 4
  CLO 1
  CLO 2
  CLO 3
  CLO 4
	Reinforced	Reinforced	Reinforced

Detailed Curriculum Maps

> **Detailed curriculum maps help program leads navigate assessment challenges, shape effective improvement plans, and identify gaps in the program.**

Programs should engage in detailed curriculum maps that include all the courses (including lower-level general education courses, electives, emphasis, and concentration courses) listed or indirectly referenced in the University Catalog.

The learning outcomes for these courses should be mapped to program learning outcomes, and the assignments of these courses should be mapped to the course learning outcomes and consequentially to the program-level learning outcomes. Program faculty should consider and evaluate if the frequency and extent of the inclusion of outcomes in course assessments adequately provide students the ability to obtain the program-level learning outcome by the conclusion of the program. Program faculty should carefully evaluate course-level learning outcomes and assignments that do not directly or indirectly support the program-level learning outcomes.

Note: While our university does not offer lower-level courses, these courses and their learning outcomes are essential components of our undergraduate degree programs. The Texas Higher Education Coordinating Board (THECB) staff, in collaboration with program faculty across the state, prescribe the learning outcomes for these courses in the Academic Course Guide Manual (ACGM). The outcomes in the manual are a valuable resource for our faculty in completing curriculum maps.

For academic programs only, each year in the fall, develop or review the program's curriculum map by identifying the program's core courses as listed in the University Catalog and indicating the relationship to the program's learning outcomes. The curriculum map aligns prescribed courses in the program's major to the program's learning outcomes by indicating where the outcome is introduced, practiced, or reinforced. Ideally, the curriculum introduces each outcome in at least one course; but in some instances, those courses may be offered at the lower level and not listed. There is no restriction from listing the lower-level courses in a program on the curriculum map. The THECB ACGM includes the general outcomes for all lower-level courses. Curriculum maps should be:

- **Comprehensive**: The map consists of all program learning outcomes
- **Courses**: The map includes all the prescribed courses listed for the major in the current catalog
- **Course Alignment**: The map associates each course with at least one outcome
- **Outcome Alignment**: The map associates each outcome with at least one prescribed course
- **Progressive**: The map demonstrates an intentional approach to introducing, reinforcing, and mastering learning outcomes

Notes:

Programs should develop maps from the program outcomes to the course outcome and assignment outcomes. A more comprehensive map ensures a well-balanced and effective program from a student learning perspective.

Assessment Calendar

The university assessment cycle functions on an academic or fiscal year (September to August) versus a calendar year (January to December). Assessment plans are developed in the fall semester and managed during the fall and spring semesters. Upon return in the following fall semester, faculty and staff report the findings for the measures in the plan, formulate action plans, and develop the next year's assessment plan. Each spring, programs provide updates to action plans. These actions are intended to take multiple years to design, implement, and demonstrate effectiveness.

Availability of Data

The data included in annual findings are not yearly data. Programs should not attempt to include the latest summer semester data in assessment findings, as collection and analysis of the data will take too long and delay the assessment process. The data for all measures should be collected and reviewed by program faculty and staff each year. Program faculty should provide three years of data when reporting findings for measures. Measures should not be included in assessment plans unless the program currently has two years of data on hand to add to the additional year collected during the year of assessment. This practice ensures that data is always available for analysis.

> **The university uses a process to manage resources to ensure all areas are assessed in a timely and continuous basis.**

Appendix A. Overview of Assessment
What is assessment?

Assessment is a powerful tool, which measures student achievement of program outcomes. Assessment is an ongoing process in which faculty and administrators determine what knowledge and skills students should be learning. Part of the assessment process is to create deliberate, measurable objectives for student learning. We commonly refer to these objectives as student learning outcomes (SLOs). The assessment process also involves developing and implementing a plan to determine how students will learn based upon SLOs. A well-developed assessment plan includes a variety of measures for each SLO, an evaluation of results, and plans to use the results to improve student learning. For a concise overview, https://www.cmu.edu/teaching/assessment/assessprogram/goalsobjectivesoutcomes.html.

Assessment is not the responsibility of any one person.

Why engage in assessment?

Assessment is an efficient and effective means of identifying opportunities for improving educational programs in higher education by creating a better educational environment through increased student learning. Assessment is not just about maintaining good standing with accreditation agencies; it is about ensuring high-quality education and improving student learning.

Who is responsible for assessment?

Assessment is not the responsibility of any single person. The best assessment plans include a variety of professionals from different areas of campus life. Assessment is the responsibility of the administration, faculty, and professional staff at Texas A&M University-Central Texas, and program-level assessment is the responsibility of all of the faculty, administrators, and staff for the degree program.

When do we "do" assessment?

Assessment is an ongoing process, and degree programs should be engaged in assessment throughout the academic year. The expectation is not for faculty and administrators to meet weekly or crunch assessment data daily (unless they want to). An ongoing process means degree programs should be reviewing and revising student learning outcome statements as needed, collecting and analyzing assessment data to make inferences about student learning for each learning outcome, and leveraging results to adjust the degree program to increase student learning in any given academic year.

Appendix B. Assessment Terminology

This publication uses terminology related to student learning outcomes and assessment.

- **Assessment** is the systematic process of determining educational objectives through gathering, using, and analyzing information about student learning outcomes to make decisions about programs, individual student progress, or accountability (Erwin, 1991, as cited in James Madison University, 2003; Oakland Community College, 2008).

- **Assessment Methods** include techniques used to collect data associated with assessment. Methods may include such techniques as course projects, graduate surveys, portfolios, external licensing exams. (Oakland Community College, 2008).

- **Assessment Plans** are the proposed methods and timeline for assessment-related activities in a given program (e.g., how and when are you going to check what/how well the students are learning) (Texas Tech University, 2018). The plan defines the formal development process for measuring student-learning outcomes, including data collection and analysis procedures (Grand State Valley University, 2010).

- **Benchmarks** (or Targets in TaskStream) are expected levels of learning for an educational outcome. A target must be quantifiable, typically stated as a percentage or number (Oakland Community College, 2008).

- **Course-Level Assessment** involves collecting assessment data within the classroom. A course-level assessment provides an opportunity to use authentic assignments and coursework for assessment purposes. The process requires evaluating the coursework using a rubric or assessment scale specific to the outcome being measured, in addition to providing a basis for grading students, these materials allow faculty to evaluate their approaches to instruction and course design (Palomba & Banta, 1999, as cited in James Madison University, 2003).

- **Direct Assessment** measures student learning by requiring students to display their knowledge and skills as they respond to the instrument itself. Examples of direct assessment methods include objective tests, essays, presentations, and classroom assignments (Oakland Community College, 2008).

- **Embedded Assessments** are carefully constructed assignments (often with a corresponding scoring rubric) that precisely measure a particular learning outcome. This assessment coincides with learning in activities such as projects, portfolios, and exhibitions. It happens in the classroom setting, and, if properly designed, students should not be able to ascertain they are being taught or assessed. Faculty develop the tasks or tests from the curriculum or instructional materials (Oakland Community College, 2008), including questions from assessment instruments or existing tests of existing courses. These assessments' reliability can suffer due to fewer assessment items (Wilson & Sloane, 2000, as cited in James Madison University, 2003).

- **Formative Assessment** gives information on students' mastery of content, knowledge, or skills during the learning experience and involves gathering information during a course, program, or undergraduate career to improve learning or to meet accountability demands. The goal of formative assessment is to monitor student learning to provide ongoing feedback that can be used by instructors to improve their teaching and by students to improve their learning. More specifically, formative assessments:
    - help students identify their strengths and weaknesses and target areas that need work
    - help faculty to recognize where students are struggling and address problems immediately (https://www.cmu.edu/teaching/assessment/basics/formative-summative.html)
- **Indirect Assessment** measures outcomes achievement by asking students to reflect on their learning rather than to demonstrate learning. Examples include external reviewers, student surveys, exit interviews, alumni surveys, employer surveys, curriculum, and syllabus analysis. (Oakland Community College, 2008).
- A **Program** is any major course of study that results in a degree (e.g., Bachelor of Business Administration in Accounting, Bachelor of Science in Computer Science, Master of Science in Educational Psychology).
- **Program-Level Assessment** evaluates student learning outcomes achievement upon completion of their programs and informs changes in pedagogy and curriculum to increase student success (Oakland Community College, 2008).
- **Program Student Learning Outcomes** (SLOs) are specific, measurable, and expected goals or results after a learning experience. These outcomes may involve knowledge (cognitive), skills (behavioral), or attitudes (affective) that provide evidence that learning has occurred because of a specified course, program activity, or process. An SLO refers to an overarching goal for a course or program (Oakland Community College, 2008).
- **Reliability** is the overall consistency of a measure. A measure is said to have high reliability if it produces similar results under consistent conditions. "It is the characteristic of a set of test scores that relates to the amount of random error from the measurement process that might be embedded in the scores. Highly reliable scores are accurate, reproducible, and consistent from one testing occasion to another. That is, if the testing process were repeated with a group of test-takers, essentially the same results would be obtained.
- **Rubrics** are scoring and instruction tools used to assess student performance using a task-specific range or set of criteria. A rubric contains the essential criteria for the task and levels of performance required to measure student performance against this predetermined set of criteria (i.e., from poor to excellent) for each criterion (Oakland Community College, 2008).
- **Summative Assessment** gives information on students' mastery of content, knowledge, or skills at the end of a learning experience and involves gathering information after a

course, program, or undergraduate career to improve learning or to meet accountability demands (Oakland Community College, 2008). The goal of summative assessment is to evaluate student learning at the end of an instructional unit by comparing it against some standard or benchmark. (https://www.cmu.edu/teaching/assessment/basics/formative-summative.html)

- **Validity** is the extent to which a concept, conclusion, or measurement is well-founded and likely corresponds accurately to the real world. The validity of a measurement is the degree to which the tool measures what it claims to measure. Validity is based on the strength of a collection of different types of evidence (e.g., face validity, or construct validity).

Appendix C. The Assessment Cycle

The assessment cycle evaluates student learning in degree programs on an ongoing basis. The goal of assessment is to continually improve the quality of learning in a degree program and is efficiently accomplished by incorporating program-level assessments into the assessment process. The assessment cycle consists of the following three phases.

Planning Phase – This foundational step consists of developing or revising learning outcome statements and selecting the specific assessment instruments or related activities for each SLO. Additionally, during the planning phase, timelines are established, and specific personnel are assigned to activities. During this planning phase, faculty identify activities as course- or program-level assessment activities. Faculty specifically and narrowly focus the knowledge and skills to be measured to single courses for course-level assessments. Degree program assessment, which is much broader than course-level assessment, addresses the knowledge and skills intended to be learned in the entire program rather than from an individual course. It is essential to develop unique, broad learning outcomes that represent the whole degree program rather than adopting a few learning outcome statements from different courses.

Assessing Phase – The assessment phase involves selecting the appropriate assessment methods for each student-learning outcome, implementing those assessments, and analyzing the assessment data to learn more about student performance in order to achieve student-learning outcomes.

Improving Phase – During this commonly omitted but <u>most important</u> phase, faculty and administrators reflect upon the information gathered from the previous planning and assessment phases to determine the changes necessary to achieve increased student learning in the degree program. Additionally, the improving phase consists of the implementation of strategies for change.
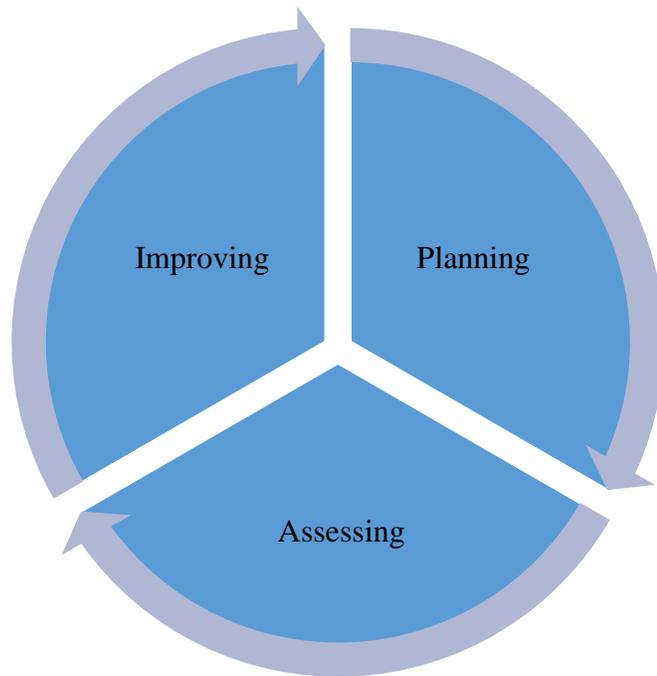
Appendix D. The Planning Phase

Expected Learning Outcomes - An expected learning outcome is a formal statement that articulates what faculty intend for students to take away from or learn in a degree program. Expected learning outcome statements refer to statements such as specific knowledge, practical skills, areas of professional development, attitudes, higher-order thinking skills. that faculty members and administrators expect students to develop, learn, or master during a degree program (Suskie, 2004). Expected learning outcomes are also often referred to as "learning outcomes," "student learning outcomes" (SLOs), or "learning outcome statements." Simply stated, expected learning outcome statements describe what faculty members want students to:

> **Outcomes define the intended takeaways from a program.**

- Know at the end of the degree program, AND
- Be able to do at the end of the degree program.

Learning outcomes have three major characteristics (American Association of Law Libraries, 2005; Texas A&M University-Central Texas, 2010). They specify learning that is

1. Observable,
2. Measurable, and
3. Done by the students or learners (rather than the faculty members).

Student-learning outcome statements should possess all three of these characteristics so that they can be assessed adequately (Suskie, 2004). Measurable SLOs are "specific, demonstrable characteristics – knowledge, skills, values, attitudes, interests" that provide evidence that SLOs are being met (University of Connecticut, n.d.).

> **Add clarity to the assessment plan by avoiding the use of verbs like <u>know</u>, <u>be aware of</u>, <u>appreciate</u>, <u>learn</u>, <u>understand</u>, <u>comprehend</u>, and <u>become familiar with</u>**

Writing Effective Learning Outcome Statements

Selection of Action Words for Learning Outcome Statements - When stating student learning outcomes, it is essential to use verbs that describe precisely what the learner(s) will be able to *know* or *do* upon completion of the degree program (American Association of Law Libraries, 2005).

Examples of strong action words to include in expected learning outcome statements include, compile, identify, create, plan, revise, analyze, design, select, utilize, apply, demonstrate, prepare, use, compute, discuss, explain, predict, assess, compare, rate, critique, outline, and evaluate.

Avoid unclear verbs in the context of an expected learning outcome statement (*e.g., know, be aware of, appreciate, learn, understand, comprehend, and become familiar with*). These words are often vague, too difficult to observe or measure, or have multiple interpretations. Consequently, it is best to avoid using these terms when creating expected learning outcome statements (American Association of Law Libraries, 2005).

For example, please look at the following learning outcomes statements:

- Upon completion of the degree, students should understand basic human development theory
- Graduates of the degree program should appreciate music from other cultures.
    - Both of these learning outcomes, as stated, will make them difficult to assess. Consider the following:
- How is someone observed "understanding" a theory or "appreciating" other cultures?
- How easy will it be to measure "understanding" or "appreciation"?
- These expected learning outcomes are more effectively stated as:
- Upon completion, students will be able to state the major theories of human development
- Graduates of the degree program should be able to assess the characteristics of music from other cultures

Also, the following is a list of some of the common areas for degree program-level student learning outcomes. These examples are meant to serve as examples of well-stated and measurable program-level student learning outcomes.

Upon completion of the Bachelor of Science in Dance, undergraduate students will be able to:

- Apply the **fundamental concepts** of the discipline to real-world situations
- Utilize **skills** related to the discipline
- **Communicate** effectively in the methods related to the discipline
- Conduct sound **research** using discipline-appropriate methodologies
- Generate solutions to **problems** that may arise in the discipline

Incorporating Critical Thinking Skills into Expected Learning Outcome Statements

Programs need to include words that reflect critical or higher-order thinking into their learning outcome statements to demonstrate the students are learning valuable skills. Bloom (1956) developed a taxonomy outlining the different types of thinking skills used in the learning process. Bloom argued that people use different levels of thinking skills to process different kinds of information and situations. Some of these are basic cognitive skills, *critical thinking skills,* or *higher-order thinking skills* such as memorization, or complex skills such as creating new ways to apply information. Anderson and Krathwohl (2001) adapted Bloom's model to include language oriented toward expected learning outcome statements.
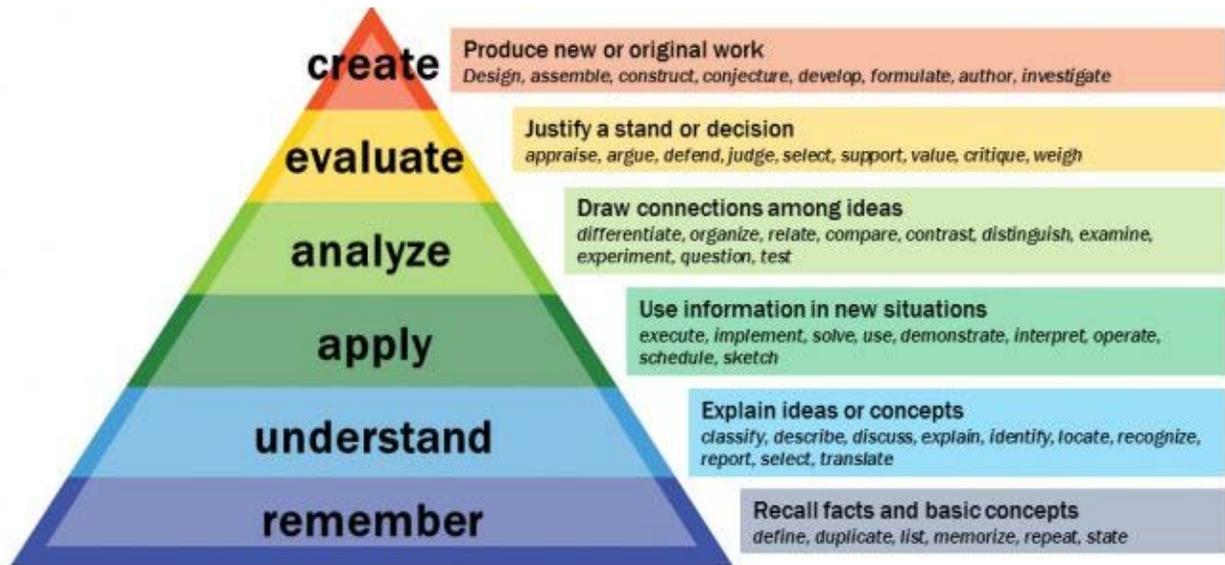
Higher-Order Thinking: Program-level student learning outcomes represent the knowledge and skills graduates possess. Therefore, at least some of a program's outcomes will reflect what is called "higher-order thinking skills" rather than learning that is more basic. The Application, Analysis, Evaluation, and Creation levels of Bloom's taxonomy are usually considered to reflect higher-order thinking skills.

Bloom's taxonomy is one of many frameworks available. (http://www.ucd.ie/t4cms/ucdtla0034.pdf).

Action Words Related to Critical Thinking Skills - The use of the following list of action words is powerful when creating the expected student learning outcomes related to critical thinking skills in programs (Kansas State University, 2003). The list is organized according to the different levels of higher-order thinking skills.

Higher Levels		
Level	**Verbs**	**Examples of Course Objective**
ANALYZE The learner must be able to break down knowledge into parts and show and explain the relationships among the parts.	Analyze, Appraise, Arrange, Associate, Breakdown, Combine, Criticize, Design, Detect, Develop, Diagram, Differentiate, Discern, Discriminate, Dissect, Distinguish, Elect, Establish, Ex-plain, Expound, Illustrate, Infer, Inspect, out, Outline, Point, Profile, Question, Refute, Relate, Select, Separate, Simplify, Subdivide, Sub-divide, Summarize, Test, Utilize	The student will be able to: -Explain the ramifications of sexual harassment in the workplace. -Appraise potential suppliers, according to organizational needs. -Distinguish between ethical and unethical behavior in a professional setting.
EVALUATE	Argue, Appraise, Assess, Attack, Champion, Compare, Compare and Contrast, Conclude, Contrast, Criticize,	The student will be able to:

The learner must be able to judge or assess the value of material and methods for a given purpose.	Critique, Debate, Decide, Deduce, Determine, Diagnose, Evaluate, Forecast, Grade, Improve, Interpret, Judge, Justify, Measure, Prioritize, Prove, Rank, Rate, Recommend, Resolve, Revise, Score, Select, Separate, Simplify, Solve, Subdivide, Sub-divide, Summarize, Support, Support, Test, Utilize, Value, Verify, Weigh	Support the value of diversity in a project team. -Recommend a course of action for a comprehensive organizational change. -Resolve ethical issues plaguing researchers conducting experiments on animals.
CREATE The learner must be able to pull together parts of knowledge to form a new whole and build relationships for new situations.	Assemble, Assimilate, Categorize, Collect, Combine, Compile, Compose, Condense, Construct, Create, Derive, Design, Develop, Devise, Drive, Elaborate, Expand, Explain, Generate, Group, Guide, Hypothesize, Integrate, Invent, Man-age, Modify, Order, Organize, Originate, Plan, Prepare, Prescribe, Produce, Propose, Rearrange, Rear-range, Reconstruct, Related, Reorganize, Revise, Rework, Rewrite, Set Up, Specify, Summarize, Support, Sup-port, Synthesize, Test, Theorize, Transform, Utilize, Value, Verify, Weigh, Write	The student will be able to: -Devise a plan to deal with violence in the classroom. -Design an instructional unit, which meets the needs of online students. -Modify the instructional design process.
Lower Levels		
REMEMBER The learner must be able to recall information, such as dates, events, places, ideas, definitions, formulas, theories.	Arrange, Count, Define, Describe, Detail, Draw, Duplicate, Identify, Indicate, Inventory, Label, List, Locate, Match, Name, Outline, Pick, Point, Pronounce, Quote, Read, Recall, Recite, Recognize, Record, Record, Relate, Repeat, Reproduce, Restate, Select, State, Underline, Write	The student will be able to: -Label the parts of the heart. Outline the steps in the writing process. -List the steps taken to make a kite. -Recite the Gettysburg Address.
UNDERSTAND The learner must be able to grasp the meaning of the information, express it in his or her own words, and cite examples.	Classify, Confirm, Contrast, Convert, Decipher, Defend, Designate, Differentiate, Equate, Estimate, Examine, Express, Extend, Extrapolate, Generalize, Give Examples, Group, Infer, Interpret, Liken, Order, Paraphrase, Predict, Reorder, Rephrase, Rewrite, Sort, Specify, Substitute, Tell, Translate, Associate, Compute, Discuss, Distinguish, Explain, Give, examples, Summarize	The student will be able to: -Defend a position about creating flat taxes. -Give an example of an adjective. -Specify the role of project management in an organization.
APPLY The learner must be able to use or apply knowledge or skills to new situations. The learner must be able to use information and knowledge to solve a problem, answer a question, or perform another task.	Add, Allocate, Alter, Apply, Calculate, Change, Choose, Complete, Compute, Conduct, Coordinate, Demonstrate, Determine, Direct, Discover, Divide, Dramatize, Draw, Employ, Execute, Formulate, Gather, Graph, Make, Manipulate, Model, Multiply, Operate, Perform, Present, Provide, Recount, Report, Schedule, Show, Sketch, Subtract, Use, Utilize, Classify, Examine, Interpolate, Modify, Prepare, Produce, Solve, Translate	The student will be able to: -Choose the criteria to assess change readiness. Demonstrate the proper technique for drawing blood. -Graph the results of the market analysis.

Keep It Simple

> **Long and detailed program outcomes can be costly and complex to measure.**

Keep program outcome statements as simple as possible. Overly specific and complex learning outcomes statements can be challenging to assess because programs need to gather assessment data for each type of knowledge or skill in a program-level student-learning outcome.

Example of a Fashion Merchandising Degree Program-Level Outcome:
Students graduating with a Bachelor of Science in Fashion Merchandising will be able to **identify** and **describe** the roles the merchant "team" (**management**, **merchant**, **planner**, **allocator**, **support staff**) perform in the **procurement** and **distribution** of merchandise to the multiple channels of retail outlets (Hicklins, 2009). This outcome would require assessments for the following:

- **Identification** of the roles that **management** performs in the **procurement** of merchandise
- **Identification** of the roles that **management** performs in the **distribution** of merchandise
- **Identification** of the roles that **merchants** perform in the **procurement** of merchandise
- **Identification** of the roles that **merchants** perform in the **distribution** of merchandise
- **Identification** of the roles that **planners** perform in the **procurement** of merchandise
- **Identification** of the roles that **planners** perform lay in the **distribution** of merchandise
- **Identification** of the roles that **allocators** perform in the **procurement** of merchandise
- **Identification** of the roles that **allocators** perform in the **distribution** of merchandise
- **Identification** of the roles that **support staff** perform in the **procurement** of merchandise
- **Identification** of the roles that **support staff** perform in the **distribution** of merchandise
- **Description** of the roles that **management** performs in the **procurement** of merchandise
- **Description** of the roles that **management** performs in the **distribution** of merchandise
- **Description** of the roles that **merchants** perform in the **procurement** of merchandise
- **Description** of the roles that **merchants** perform in the **distribution** of merchandise
- **Description** of the roles that **planners** perform in the **procurement** of merchandise
- **Description** of the roles that **planners** perform in the **distribution** of merchandise
- **Description** of the roles that **allocators** perform in the **procurement** of merchandise
- **Description** of the roles that **allocators** perform in the **distribution** of merchandise
- **Description** of the roles that **support staff** perform in the **procurement** of merchandise
- **Description** of the roles that **support staff** perform in the **distribution** of merchandise

Possible Paraphrase of this Fashion Merchandising Degree Program-Level Outcome
Students graduating with a Bachelor of Science in Fashion Merchandising will be able to summarize the roles the merchant team plays in the procurement and distribution of merchandise.

Tips:

- Limit the total number of student learning outcomes to 3-5 statements for the entire degree program
- Make each learning outcome statement measurable
- Focus on the expectation of overarching or general knowledge and skills gained from the entire degree program before graduation rather than focusing on what happens in any one individual course (American Public University System, 2012)
- Create student-centered (what the student will learn) rather than faculty-centered (what the faculty will teach) statements (e.g., "upon completion of this program students will be able to list the names of the 50 states" versus "one objective of this program is to teach the names of the 50 states")
- Incorporate or reflect the institutional and college missions and purposes as appropriate
- Incorporate various ways for students to show success such as outlining, describing, modeling, and depicting rather than using a single statement such as "at the end of the degree program, students will know [Blank] as the stem for each expected outcome statement

Appendix E. The Assessing Phase

Assessment Methods

Assessment involves the systematic collection, review, and use of evidence or information related to student learning (Palomba & Banta, 1999). Assessing programs helps faculty and program administrators evaluate how well students are mastering the knowledge and skills in the degree program. Assessment is the process of investigating:

1. What students are learning, and
2. How well students are learning the program learning outcomes

Developing Assessment Methods

- Each SLO should have *at least* two assessment methods because multiple methods increase the reliability of findings
- Identify the target population (e.g., all seniors, graduating seniors, alumni, faculty) for each assessment activity
- Establish timelines for gathering and regularly analyzing program assessment data (at least once per academic year)
- Collect data from graduating seniors as close to graduation as possible
- Assign specific personnel to each task

Selection of Assessment Methods

Multiple measures in a plan allow of triangulation for the data and multiple methods allow for a richer picture outcome achievement.

Select at least two appropriate assessment methods for each degree program-level SLO. There are two types of assessment methods. ***Direct assessment methods*** are measures of student learning, requiring students to display actual knowledge and skills (rather than report what they *think* their knowledge and skills are) (Oakland Community College, 2008). As direct assessment measures students' actual learning rather than perceptions of learning, practitioners often view the method as the *preferred* type of assessment. In contrast, *indirect assessment methods* ask students to reflect on their learning rather than to demonstrate it (Palomba & Banta, 1999, as cited in Texas A&M University, n.d.).

The practice of using both direct and indirect assessment methods serves to provide useful insights in determining the strengths and weaknesses of student learning in a degree program (Maki, 2004, as cited in Texas A&M University, n.d.). Direct and indirect assessment methods each have unique advantages and disadvantages in terms of the type of data and information yielded. While indirect methods often provide a deeper understanding of data revealed by direct methods, it is difficult to interpret the specific knowledge and skills gained from student learning with indirect methods (Texas A&M University, n.d).

Examples of Direct Assessment Methods (Texas A&M University, n.d):

Capstone assignment/project	Case studies	Class discussions
Comprehensive exams	Course-level assessments	Dissertations
Embedded assignments (such as projects, papers, presentations, performances)	Essays	Exhibits
External examiners/peer reviews	Field placements/internships	Grading with criteria or rubrics
Internal/external juried review of performances and exhibitions	Internships and clinical evaluations	Locally developed exams
Oral exams	Performance	Portfolio evaluations
Pre- and post-tests	Professional development activities	Qualifying exams
Reflective journals	Regionally or nationally developed tests/exams (i.e., GRE subject exams, certification exams, licensure exams)	Senior theses or major projects

| Study abroad experience | Theses | |

Examples of Indirect Assessment Methods (Texas A&M University, n.d):

Alumni surveys	Exit interviews	Focus groups
Graduation and retention rates	Job/graduate school placement statistics	Peer assessments
Surveys sent to stakeholders such as students, faculty, alumni, and employers that assess perceptions of the program.		

Reliability and Validity of Measures

> **Reliability is necessary, but not singularly sufficient. For a test to be reliable, it must also be valid. For example, if your scale is off by 5 pounds, it reads your weight every day with an excess of 5 pounds. The scale is reliable because it consistently reports the same weight every day, but it is not valid because it adds 5 pounds to your actual weight. It is not a valid measure of your weight.**

Reliability is the degree to which an assessment tool produces stable and consistent results.

Types of Reliability

Test-retest reliability is a measure of reliability obtained by administering the same test twice over a reasonable period to the same group of individuals. The scores from Time 1 and Time 2 can then be correlated to evaluate the test for stability over time.

Example: A test designed to assess student learning in psychology could be given to a group of students twice, with the second administration coming a week after the first. The obtained correlation coefficient would indicate the stability of the scores.

Parallel forms reliability is a measure of reliability obtained by administering different versions of an assessment tool (both versions must contain items that probe the same construct, skill, or knowledgebase) to the same group of individuals. The scores from the two versions can then be correlated to evaluate the consistency of results across alternate versions.

Example: To evaluate the reliability of a critical thinking assessment, create a large set of items that all pertain to critical thinking and then randomly split the questions up into two sets, which would represent the parallel forms.

Inter-rater reliability is a measure of reliability used to assess the degree to which different judges or raters agree in their assessment decisions. Inter-rater reliability is useful because human observers will not necessarily interpret answers the same way; raters may disagree as to how well specific responses or material demonstrate knowledge of the assessed construct or skill.

For e*xample,* inter-rater reliability might be implemented when different judges are evaluating the degree to which art portfolios meet specific standards. Inter-rater reliability is especially useful when judgments can be considered relatively subjective. Thus, the use

of this type of reliability would probably be more likely when evaluating artwork as opposed to math problems.

Inter-rater reliability is calculated by having two independent raters apply a rubric to student work and then comparing the results. This convenient tool can be used to calculate the reliability index: http://justusrandolph.net/kappa/.

Internal consistency reliability is a measure of reliability used to evaluate the degree to which different test items that probe the same construct produce similar results.

Average inter-item correlation is a way of analyzing internal consistency reliability by determining if specific questions on a test or questionnaire give consistent, appropriate results. Different items meant to measure the same general construct or idea are checked to see if they give similar scores.

Split-half reliability is another subtype of internal consistency reliability. The process of obtaining split-half reliability is begun by "splitting in half" all items of a test that are intended to probe the same area of knowledge (e.g., World War II) to form two "sets" of items. Faculty administer the *entire* test to a group of individuals, compute the total score for each "set," and then obtain the split-half reliability by determining the correlation between the two total "set" scores.

Validity refers to how well a test measures what it is purported to measure.

Types of Validity

Face Validity ascertains that the measure appears to be assessing the intended construct under study. The assessor can easily assess face validity. Although this is not a very "scientific" type of validity, it may be an essential component in enlisting the motivation of the assessor. If the assessors do not believe the measure is an accurate assessment of the students' abilities, for example, they may become disengaged with the task.

> *Example*: If a measure of art appreciation is created, all of the items should be related to the different components and types of art. If the questions are regarding historical periods, with no reference to any artistic movement, assessors may not be motivated to give their best effort or invest in this measure because they do not believe it is an accurate assessment of art appreciation.

Construct Validity ensures the measure is measuring the intended outcome (i.e., the construct), and no other variables. Using a panel of "experts" familiar with the construct is a way to assess this type of validity. The experts can examine the items and decide what that specific item is intended to measure. Students can be involved in this process to obtain their feedback.

> *Example*: A women's studies program may design a cumulative assessment of learning throughout the major, employing complicated wording and phrasing within the questions. The complexity of the assessment can cause the test to inadvertently become a test of reading comprehension, rather than a measure of mastery of women's studies. The measure must assess the intended construct, rather than an extraneous factor.

Criterion-related Validity is used to predict future or current performance - it correlates test results with another criterion of interest.

Example: A physics program designed a measure to assess cumulative student learning throughout the major and correlated the new measure with a standardized measure such as an ETS field test or the GRE subject test, which fostered an increased belief in the new assessment tool.

Formative Validity, when applied to the assessment of outcomes, is useful in assessing how well a measure can provide information to help improve the program under study.

Example: When designing a rubric for history, one could assess a student's knowledge across the discipline. If the measure can provide information that students lack knowledge in a particular area--for instance, the Civil Rights Movement--then that assessment tool is providing meaningful information that can be used to improve the course or program.

Sampling Validity (similar to content validity) ensures that the measure covers a broad range of areas within the concept under study. The assessment cannot include everything, so items need to be sampled from all of the domains. A panel of experts may need to be employed to sample the content area adequately. Additionally, a panel can help limit "expert" bias (i.e., a test reflecting what an individual personally deems to be the most important or relevant area).

Example: When designing an assessment of learning in the theatre department, it would not be sufficient to cover issues related to acting only, excluding other areas of theatre such as lighting, sound, and stage manager functions. The assessment should reflect the content area in its entirety.

Ways to Improve Validity

- Clearly define and operationalize goals and objectives. Faculty expectations of observable student performance should be written down
- Match assessment measures to goals and objectives. Solicit feedback from an outside party less invested in the instrument by asking faculty at other schools to review
- Get students involved by having them look over the assessment for troublesome wording or other difficulties
- Compare the measure with other measures or other data that may be available

Benchmarks

Targets may be set by comparing to results of a common external assessment or a trend of internal assessment results.

Benchmarks state the level of performance expected of students. Each benchmark is the minimally acceptable level of performance for an educational outcome (Grand Valley State University, 2010). Degree programs should develop a benchmark for each student-learning outcome for their program.

There are two general types of benchmarks:

(External) The first type of benchmark compares students to other groups or populations. For example, graduating seniors from the education degree program will score at or above the state mean on the Texas Teachers Certification Exam. Faculty typically use this type of benchmark when

the discipline uses a common assessment instrument. This assessment instrument is often regionally or nationally developed and used at other institutions or agencies (e.g., the bar exam for attorneys) or when a field requires professional licensure.

(Internal) The second type of benchmark compares student performance on a given student-learning outcome to a specific and predetermined performance level. For example, 70% of graduating seniors will be able to articulate their philosophy of education. In this type of benchmark, degree programs typically select a percentage of their students who should exhibit competent performance for the student-learning outcome.

Selecting the Numerical "Threshold" Of Acceptable Performance

When determining the "threshold" for each degree program-level student-learning outcome, faculty and administrators should discuss what quantitative or qualitative value reflects the best threshold of performance for that learning outcome. Although this is not an absolute rule, faculty frequently set benchmarks at a level that correlates to *average performance* as an acceptable level of performance to graduate for most degree programs. The criterion may be different based on the type of degree program (e.g., highly specialized or graduate programs). Faculty and administrators do not necessarily need to select a number reflective of the average performance for their benchmarks. Sometimes faculty and administrators choose to use existing data as a baseline benchmark to compare future performance. They might also use data from a similar exemplary degree program at another university as a benchmark threshold. However, the data set functions as a target goal, rather than as a baseline (Hatry, van Houten, Plantz, & Greenway, 1996).

Whichever process program faculty and administrators use to set benchmark thresholds, it is essential to select a benchmark that is meaningful in the context of the degree program to measure the improvement of institutional performance (Grand Valley State University, 2010).

Analyzing the Assessment Data

> **A good findings narrative will include the data or assessment results and an evaluative comment on how the results demonstrate outcome attainment.**

Degree programs should incorporate the analysis of all assessment data as a routine part of program management. The data gathered for each outcome should be analyzed and evaluated on an annual basis.

Analysis of assessment data should help identify the following:

- Areas for more focused assessment
- Ways to revise outcomes
- What students are learning in relation to each outcome
- How well students are learning the material that relates to those outcomes
- How well the selected assessment methods measure each outcome
- Areas to investigate in the next phase of assessment – the Improving Phase

Appendix F. The Improving Phase

        The improving phase is the ultimate purpose of assessment and involves reviewing the results to identify strategies to improve the quality of students' experiences and learning. It is essential to learn from the assessment results to "close the loop" rather than merely reaching or maintaining the benchmark or criterion (Chaffey College, n.d.).

Possible **Academic** Program Improvement Actions	Possible **Administrative** Program Improvement Actions
Consult an instructional designer	Change means, timing, or location a service is offered
Introduce a high-impact practice into program courses	Begin, modify, or discontinue a practice
Change content delivery for some part of a course	Collaborate with other departments or academic units to offer a service
Change the timing of content delivery	Solicit for grant funding to add resources to a program
Introduce and reinforce competencies in a variety of ways	Create a communication plan about underutilized resources
Add or remove a program core or discipline-specific course	Apply limitations on resources to redirect use to underserved groups
Change course prerequisites or sequencing	
Change course content to affect program-learning outcomes	
Change program admissions standards or modify articulation agreements	

Appendix G. Program Meeting

        Walvoord (2004) recommends at least one faculty or department meeting a year to discuss the program's student learning outcomes and assessment plan. This meeting should be at least two hours long and focus on the degree program's student learning outcomes, assessment data, and potential improvements. It is not necessary to wait to schedule this meeting until the assessment plan and data are "perfect."

> **Assessment per se guarantees nothing by way of improvement; no more than a thermometer cures a fever (Marchese, 1987)**

Possible topics for this meeting include:

- Share assessment data results with program faculty and staff
- Discuss these assessment results as they relate to each SLO
- Review assessment results to determine programmatic strengths and areas for improvement

- Decide if the program needs different assessment methods to obtain more targeted information
- Determine how assessment results can be used to make improvements to the program (e.g., changes to the curriculum, provide professional development for teaching personnel in certain areas)
- Develop an action plan to implement these improvements
- Implement specific strategies to execute the action plan
- Review what needs to be done as the assessment cycle transitions back to the Planning Phase (e.g., Do faculty need to revise student-learning outcomes? Are different assessment methods necessary?)

Contact Institutional Research and Assessment at IRE@TAMUCT.EDU for further assistance or consultation in developing a program-level assessment plan.

References

American Association of Law Libraries. (2005). Archived: Writing learning outcomes. Retrieved from http://www.aallnet.org/Archived/Education-and-Events/cpe/outcomes.html

American Public University System. (2012). *Student learning outcomes assessment*. Retrieved from http://catalog.apus.edu/2012/graduate/academic-information/learning-outcomes.htm.

Anderson, L. W., & Krathwohl, D. R. (Eds.). (2001). *A taxonomy of learning, teaching, and assessment: A revision of Bloom's taxonomy of educational objectives*. New York, NY: Longman.

Bloom, B. S. (1956). *Taxonomy of educational objectives: The classification of educational goals*. New York, NY: Longman.

Chaffey College. (n.d.). *Frequently Asked Questions (FAQ)*. Retrieved from http://www.chaffey.edu/slo/faq.html.

Erwin, T. D. (1991). *Assessing student learning and development: A guide to the principles, goals, and methods of determining college outcomes*. San Francisco: Jossey-Bass.

Grand Valley State University. (2010). *Aspects of GSVU assessment*. Retrieved from http://www.gvsu.edu/assessment/aspects-of-gvsu-assessment-13.htm

Hatry, H., van Houten, T., Plantz, M. C., & Greenway, M. T. (1996). *Measuring program outcomes: A practical approach*. Alexandria, VA: United Way of America.

James Madison University. (2003). In *Dictionary of Student Outcome Assessment*. Retrieved from http://people.jmu.edu/yangsx/.

Kansas State University. (2003). *Action verb list – Suggested verbs to use in each level of thinking skills.* Retrieved from http://www.k-state.edu/assessment/toolkit/outcomes/action.html

Oakland Community College. (2008). *Terminology & Definitions*. Retrieved from https://www.oaklandcc.edu/assessment/terminology.htm#assessment

Palomba, C. A. & Banta T. W. (1999). *Assessment essentials: Planning, implementing, and improving assessment in higher education*. San Francisco, CA: Jossey-Bass.

Palomba, C. A. & Banta, T. W. (Eds.). (2001). *Assessing student competence in accredited disciplines: Pioneering approaches to assessment in higher education*. Sterling, VA: Stylus.

Siebold, R. & Beal, M. (2005). Online course development guide: The workbook. Presented at The Teaching Professor Conference in Schaumburg, IL.

Suskie, L. (Ed.) (2001). Assessment to promote deep learning: Insight from AAHE's. 2000 and 1999 Assessment Conferences.

Suskie, L. (2004). Assessing student learning: A common sense guide. Bolton, MA: Anker.

Texas A&M University. (n.d.). *Direct and indirect methods of assessment*. Retrieved from http://assessment.tamu.edu/resources/methods.html.

Texas Tech University. (n.d.). *Outcomes and assessment terminology*. Retrieved from http://www.tltc.ttu.edu/content/asp/assessment/pages/pg02.pdf

Texas Tech University. (2005). *Texas A&M University-Central Texas 2005-06 Undergraduate and Graduate Catalog Volume LXXXII*. Lubbock, TX: Office of Official Publications.

Texas Tech University. (2010). How do I create an effective syllabus? Retrieved from http://www.tltc.ttu.edu/teach/TLTC%20Teaching%20Resources/EffectiveSyllabus.asp.

The University of Connecticut. (n.d.). *Assessment primer: Goals, objectives, and outcomes*. Retrieved from http://assessment.uconn.edu/primer/goals1.html

The University of South Carolina. (n.d.). *Example of program-specific learning outcomes.* Retrieved from http://kudzu.ipr.sc.edu/effectiveness/outcomes_pf.htm .

The University of Virginia. (2012). *Planning Assessments*. Retrieved from http://avillage.web.virginia.edu/iaas/assess/ process/plan.shtm.

Walvoord, B. E. (2004). *Assessment Clear and Simple: A practical guide for institutions, departments, and general education*. San Francisco, CA: Jossey-Bass.

Wilson, M., & Sloane, K. (2000). From principles to practice: An embedded assessment system. Applied Measurement in Education, 13(2), 181-208.