

Step-by-Step Assessment Plans

October 24, 2011, R. W. Larsen

Overview

Writing an assessment plan can be done in about seven steps:

- 1. Determine Your Program Learning Outcomes**
What do you want your graduates to know, and be able to do when they graduate?
- 2. Decide Where Each Outcome is Included in Your Curriculum**
Where do you prepare your students to achieve those particular outcomes?
- 3. Decide Where You Can Gather Evidence of Student Performance for Each Outcome**
Are there particular assignments in your courses, or particular questions on an examination, where students demonstrate an outcome?
- 4. Set an Expected Performance Threshold for Each Outcome**
How good is “good enough”?
- 5. Create a Schedule for Assessing Each Outcome**
When will you check student performance on each outcome?
- 6. Describe Your Process for Assessing the Data**
How will your department use the data to monitor student performance and improve your program (if improvements are needed)?
- 7. Submit Your Assessment Plan**
Send a copy of your assessment plan to the Provost’s Office.

Writing an assessment plan isn’t too difficult, it just takes a bit of thought about your program, your students, and your curriculum – things faculty tend to think about anyway.

Note: There is another step required when it comes time to actually assess student work: creating scoring rubrics. Scoring rubrics are not required as part of the Assessment Plan, and will be covered separately.

Step 1. Determine Your Program Learning Outcomes

What do you want your students to know, to be able to do, and (sometimes) to be when they graduate from your program? The answers to this question are the list of *learning outcomes* for your degree program.

Program learning outcomes are generally written in the form of statements starting with “Our graduates will...”

You don’t need to start from scratch here. Many disciplines provide lists of expected competencies, or student learning outcomes. Moreover, there is a great deal of commonality among the program learning outcomes across a wide range of disciplines. Common program learning outcomes include:

- An outcome related to having the requisite knowledge.
Our graduates will have the knowledge required to be successful in their field.
- An outcome related to being able to function as a professional in their field.
Our graduates will have the skills needed to be able to function successfully in their field.
- An outcome related to critical thinking and higher-level cognitive skills.
Our graduates will be able to analyze problems in their field and develop solutions or strategies to solve those problems.
- An outcome related to communication skills.
Our graduates will be able to communicate effectively.
- An outcome related to ethical decision making.
Our graduates will be able to apply to discipline's code of ethics when making decisions.
- Outcomes specific to your discipline.
Our graduates will be able to design an experiment and analyze data.

The first step is to develop a list of learning outcomes for your degree program, and you need to complete that step before moving on to step 2.

Assign every outcome a number or letter so that they can be easily identified.

As an example, the program learning outcomes listed above could be written as:

Our graduates will:

1. *have the knowledge required to be successful in their field.*
2. *have the skills needed to be able to function successfully in their field.*
3. *be able to analyze problems in their field and develop solutions or strategies to solve those problems.*
4. *be able to communicate effectively.*
5. *be able to apply the discipline's code of ethics when making decisions.*
6. *be able to design an experiment and analyze data.*

Step 2a. Decide Where Each Outcome is Addressed in Your Curriculum

There is an assumption here that what your students are studying over the years is preparing them to demonstrate proficiency on your stated learning outcomes. With that assumption in mind, create a matrix that lists the required courses down the left side of the matrix, and the learning outcomes across the top. The course list can generally be taken from the MSU Online Catalog.

The example here shows courses from Environmental Horticulture/Landscape Design Option (chosen at random from the MSU Catalog).

Matrix 1. All Required Courses

	Cr	Outcomes					
		1	2	3	4	5	6
ARCH 151--Design Fundamentals I	4						
BIOB 170IN--Principles of Biological Diversity	4						
CHMY 121IN--Intro to General Chemistry	4						
WRIT 101W--College Writing I	3						
M 145--Math for Liberal Arts	3						
BIOB 110CS--Introduction to Plant Biology	3						
HORT 131--Landscape Design, Hist/Theory	3						
HORT 105--Miracle Growing	3						
Core Electives	7						
ENSC 245IN--Soils	3						
HORT 231--Woody Ornamentals	3						
HORT 232--Herbaceous Ornamentals	3						
EGEN 115--Engineering Graphics	1						
EGEN 116-- Engineering Graphics Lab	1						
HORT 225--Landscape Graphics I	3						
HORT 226--Landscape Graphics II	3						
Communication Electives	6						
Core Electives	7						
HORT 310--Turfgrass Management	3						
HORT 331--Planting Design	3						
HORT 335--Site Development	4						
HORT 336--Landscape Construction	4						
Business Electives	6						
Core Electives	10						
HORT 431--Tough Plants in Tough Places	3						
HORT 432--Advanced Landscape Design	4						
Technical Electives	9						
Horticulture Electives	6						
Core Electives	4						

The shaded courses in Matrix 1 are courses outside of the department. Since the department does not have a lot of control over those courses, they are not the best choices for designing an assessment plan. As a first pass, let’s take those courses off the table, and consider only those courses that the department can manage directly. The remaining courses are shown in Matrix 2.

Matrix 2. All Required Courses Offered by Department

	Cr	Outcomes					
		1	2	3	4	5	6
BIOB 170IN--Principles of Biological Diversity	4						
BIOB 110CS--Introduction to Plant Biology	3						
HORT 131--Landscape Design, Hist/Theory	3						
HORT 105--Miracle Growing	3						
ENSC 245IN--Soils	3						
HORT 231--Woody Ornamentals	3						
HORT 232--Herbaceous Ornamentals	3						
HORT 225--Landscape Graphics I	3						
HORT 226--Landscape Graphics II	3						
HORT 310--Turfgrass Management	3						
HORT 331--Planting Design	3						
HORT 335--Site Development	4						
HORT 336--Landscape Construction	4						
HORT 431--Tough Plants in Tough Places	3						
HORT 432--Advanced Landscape Design	4						

Next, use a highlighter to indicate where in the curriculum matrix the outcome is addressed. I have filled in some cells as an example in Matrix 3 (no link to reality in the Landscape Design Option is implied.)

Matrix 3. Curriculum/Outcome Matrix – First Pass

	Cr	Outcomes					
		1	2	3	4	5	6
BIOB 170IN--Principles of Biological Diversity	4						
BIOB 110CS--Introduction to Plant Biology	3						
HORT 131--Landscape Design, Hist/Theory	3						
HORT 105--Miracle Growing	3						
ENSC 245IN--Soils	3						
HORT 231--Woody Ornamentals	3						
HORT 232--Herbaceous Ornamentals	3						
HORT 225--Landscape Graphics I	3						
HORT 226--Landscape Graphics II	3						
HORT 310--Turfgrass Management	3						
HORT 331--Planting Design	3						
HORT 335--Site Development	4						
HORT 336--Landscape Construction	4						
HORT 431--Tough Plants in Tough Places	3						
HORT 432--Advanced Landscape Design	4						

At this point some patterns are beginning to emerge:

- Outcome 1, knowledge of the discipline, shows up almost everywhere – this is pretty typical.

- Outcome 4, communication skills, only shows up in the capstone course, HORT 432.¹ Without more consistent opportunities to practice writing and speaking, these students are not likely to be proficient in communication skills in the capstone course.
- Outcome 5, applying a code of ethics to decision making, is not covered in the curriculum at all. It's hard to image how the students can be expected to pick up that skill without learning it somewhere.
- HORT 310 – this course does not contribute to any of the stated learning outcomes. This points to one of two possibilities:
 - This course is not needed in the curriculum.
 - This course is really important for a learning outcome that has been overlooked.

Looking for these kinds of patterns is an important use of the Curriculum/Outcome Matrix. When the faculty members start looking for these kinds of patterns, they are doing assessment on their program. When they start modifying courses to ensure that all outcomes are being met, they are “closing the loop” on assessment by using assessment results to improve their program.

Step 2b. Add Cognitive Skill Levels to the Curriculum/Outcome Matrix

For a simple assessment plan, you could move on to step 3 now, but assessment experts are now suggesting that not only think about where in the curriculum each learning outcome is addressed, but what cognitive skill level is used for each highlighted course.

To think about cognitive skill level, consider this abbreviated table of (old) Bloom Taxonomy² verbs:

I: Introductory Level		D: Developing Level		M: Mastery Level	
Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation
defines	comprehends	applies	analyzes	categorizes	concludes
describes	distinguishes	computes	compares	composes	critiques
identifies	interprets	demonstrates	contrasts	creates	defends
knows	summarizes	prepares	distinguishes	devises	evaluates
lists		solves		designs	interprets
recognizes				modifies	justifies

Note: “Mastery” implies a level considered proficient at time of graduation.

As a second pass, add an **I** (Introductory), **D** (Developing), or **M** (Mastery) to each of the highlighted matrix cells, to indicate the predominate cognitive skill level for each outcome in each highlighted course.

¹ Remember – this matrix does not really reflect what is actually covered in these courses. I made this up.

² Bloom, B. S., Engelhart, M. D., Furst, E. J., Hill, W. H., & Krathwohl, D. R. (1956). *Taxonomy of educational objectives: the classification of educational goals; Handbook I: Cognitive Domain* New York, Longmans, Green, 1956.

Matrix 4. Curriculum/Outcome Matrix – Second Pass

	Cr	Outcomes					
		1	2	3	4	5	6
BIOB 170IN--Principles of Biological Diversity	4	I					
BIOB 110CS--Introduction to Plant Biology	3	I					
HORT 131--Landscape Design, Hist/Theory	3	I					I
HORT 105--Miracle Growing	3	I		M			
ENSC 245IN--Soils	3	I	I				
HORT 231--Woody Ornamentals	3	I					
HORT 232--Herbaceous Ornamentals	3	I					
HORT 225--Landscape Graphics I	3	I	I				
HORT 226--Landscape Graphics II	3	D	D				
HORT 310--Turfgrass Management	3						
HORT 331--Planting Design	3	D	D	D			D
HORT 335--Site Development	4	D	D	I			
HORT 336--Landscape Construction	4	D	D				
HORT 431--Tough Plants in Tough Places	3	I					
HORT 432--Advanced Landscape Design	4		M	I	M		M

Again, patterns should begin to emerge:

- For outcomes 2 and 6 the concept is introduced early, the students have a chance to practice (D) in later courses, and demonstrate mastery in their capstone course, HORT 432.
- For outcome 1, the concept is introduced and developed, but students are never asked to demonstrate mastery.
- For outcome 3, the students are expected to demonstrate mastery in HORT 105 (not likely in a 100-level course), and the expected cognitive skill level decreases later in the student’s career. This is likely to frustrate and/or bore students.

Generally, you want to see cognitive skill levels increase as the student progresses through the curriculum.

If faculty members start adapting the way they teach their courses so that they are building cognitive skill levels in their students, they are “closing the loop” on assessment by using assessment results to improve their program.

Step 3. Decide Where You Can Gather Evidence of Student Performance

An important part of an assessment plan is demonstrating student performance for each learning outcome by looking (assessing) examples of student work. Step 3 involves identifying specific assignments that can be used to show how well the students are doing for each learning outcome.

Generally, you will want to look for assignments in highlighted courses with “M” marks (or at least “D” marks). Every outcome has to be assessed in some way. You can gather data from multiple courses to assess a single outcome.

Note: The “knowledge of the discipline” outcome might be assessed using a discipline-based proficiency examination, rather than data from a course.

Hint: If your department offers several degree programs, you can save a lot of effort by identifying assignments for assessment in common courses whenever possible.

Triangulation

Triangulation is a term for using multiple assessments to document student performance on a single outcome. Multiple assessments provide a richer data set for assessment, but triangulation is not an essential element of a simple assessment plan.

Step 4. Set an Expected Performance Threshold for Each Outcome

As long as students can “squeak by” and graduate with an overall GPA of 2.001, it is unreasonable to expect every student to demonstrate mastery in every outcome. Every department needs to decide what constitutes an acceptable performance threshold in each outcome.

The acceptable performance threshold is generally tied to the levels on scoring rubrics. A typical scoring rubric is shown below to illustrate the possible levels.

Graduates will have an ability to design a system that meets stated needs.				
Outcome Category	Unacceptable	Marginal	Acceptable	Exceptional
Clearly articulated need that is to be addressed by the design.	No need is indicated.	Need stated incompletely or ambiguously.	Statement of need is made, but some improvement is possible.	Clearly articulated statement of need.
Does the proposed design meet the need?	No evidence that the proposed design will meet the stated need.	Reader must infer how the design will meet the need.	It is apparent that the design will meet the stated need, but some improvements are possible.	The utility of the design in meeting the stated need is well communicated as part of the presentation.
Has the group assembled a logical and practical sequence of integrated unit operations?	The proposed design cannot achieve the intended result.	The proposed design will likely work, but design has significant shortcomings.	The proposed design appears to be a reasonable approach to accomplishing the intended task.	The proposed design exhibits a high degree of innovation.

A typical acceptable performance threshold might be: ***At least 80% of students will be rated “Acceptable” or higher on every category of the scoring rubrics.***

Your program’s assessment plan must indicate what the program’s faculty decides is the acceptable performance threshold for each outcome.

Step 5a. Create a Schedule for Assessing Each Outcome

The great news is that you do not need to assess every outcome every year! A typical assessment plan utilizes a three or four year cycle to assess every outcome. A schedule for assessing the outcomes might look like the following:

Outcome	Year					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
1	X			X		
2	X			X		
3		X			X	
4		X			X	
5			X			X
6			X			X

You need to provide a three or four year cycle that indicates when each outcome will be assessed.

Indicating more than one cycle is not essential, but it helps keep your assessment plan from going out of date as quickly.

Step 5b. Create a Schedule for Reviewing Assessment Plan Elements

The elements of your assessment plan need to be reviewed periodically, and updated when necessary. There are a couple of ways of specifying this in the assessment plan:

Option 1: Provide a Schedule Matrix

Element	Year					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
Outcomes	X			X		
Rubrics		X			X	
Matrix			X			X
Schedule			X			X

Option 2: Use Text

Each element of the assessment plan (learning outcomes, scoring rubrics, curriculum/outcomes matrix, and necessary schedules) will be reviewed and updated as necessary at the beginning of each three-year assessment cycle.

Whichever option you choose, indicate how and when you will review the assessment plan elements.

Remember: Any time an assessment plan element is updated, the plan must be updated and forwarded to the Provost's Office.

Step 5c. Create a Schedule for Reviewing the Courses in the Curriculum/Outcomes Matrix

The courses listed in the curriculum/outcomes matrix are the inputs to the assessment process. While assessing those courses is not part of assessment of program learning outcomes, the course learning outcomes do need to be periodically assessed (probably by the instructor) and reviewed by the program faculty.

I'll be happy to talk with departments about what course assessment might look like, but for the purpose of developing a program assessment plan, all that is required is the schedule that will be used for reviewing the courses listed in the curriculum/outcomes matrix. An example is shown below:

Course	Year					
	2011-12	2012-13	2013-14	2014-15	2015-16	2016-17
BIOB 170IN	X			X		
BIOB 110CS	X			X		
HORT 131	X			X		
HORT 105	X			X		
ENSC 245IN	X			X		
HORT 231	X			X		
HORT 232	X			X		
HORT 225	X			X		
HORT 226	X			X		
HORT 310			X			X
HORT 331			X			X
HORT 335			X			X
HORT 336			X			X
HORT 431			X			X
HORT 432			X			X

In this example, lower division courses are reviewed one year, and upper division courses are reviewed in a different year. A three-year cycle was used to maintain consistency with the rest of the assessment process.

Your department faculty can select the scheduling approach they would like to use for course reviews.

Step 6. Describe Your Process for Assessing the Data

In step 3 the sources of assessment data were identified. In this step you need to describe what will happen to the data once it is collected. How will the assessment data be used?

A typical process description might look something like this:

Annual Assessment Process

1. Data is collected from identified courses.
2. Random samples of collected assignments are scored by two faculty members using prepared scoring rubrics.
3. The assessment coordinator tabulates the scores. Areas where the acceptable performance threshold has not been met are highlighted.
4. The scores are presented to the faculty for assessment.
5. The faculty reviews the assessment results, and makes decisions on how to respond.
 - If an acceptable performance threshold has not been met, a faculty response is required. Possible responses:
 - Gather additional data next year to verify or refute the result.
 - Change something in the curriculum to try to fix the problem.
 - Change the acceptable performance threshold.
 - Choose a different assignment to assess the outcome.
 - Faculty can respond to assessment results even if the acceptable performance threshold has been met.
 - It is OK to determine that changes are not needed when students are demonstrating proficiency with each learning outcome.
6. A summary of the year's assessment activities and faculty decisions is reported to the Provost's Office in your Department's Annual Assessment Activities report.

Your department doesn't have to use these steps, but odds are your process will be similar to the one listed here.

Step 7. Submit Your Assessment Plan

The last step is to submit your Assessment Plan to the Provost's Office (electronic submission preferred). Remember to provide an updated plan any time changes are made. Your plan should also be re-submitted at the beginning of each assessment cycle (in your plan) so that we always have a current plan on file.

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