BUILDING THE FOUNDATION OF PROGRAM ASSESSMENT OF STUDENT LEARNING

An Assessment Committee document prepared for the faculty of Dominican University

In order to ensure continuous improvement of student learning, it is important that each program undergoes formal, systematized, and continual assessment of student learning. While, for the most part, continual assessment is already happening in virtually every program, the lack of a systematized and formal assessment process, limits the extent to which faculty can reflect on and discuss ways to improve student learning. Essentially, this means that what is needed for each program is an assessment plan that possesses a set of articulated goals from which are derived program outcomes. By aligning specific program outcomes with specific courses within a program, a more holistic perspective of the assessment process emerges.

Overview of Goals and Outcomes of Student Learning

Program Goal	A general statement of what a program intends to accomplish with respect to student learning.
Program Outcome	A measurable statement of student learning that is derived from and an indicator of a specific program goal.

Once program outcomes are formally aligned with specific courses in a program, members of the program can use this information to develop an actual program assessment plan. In the plan, members of the program will systematize when and in what courses specific program outcomes will be assessed. Generally, you do not want to assess every outcome every semester. Rather, it is preferable to assess only one or two program outcomes each semester and to use only those courses that will provide a representative sample of the student population in the program. The outcomes you decide to assess each semester are up to you and the members of your program. However, it is usually the case that within a 3-5 year time period all program outcomes will have been formally assessed. This will all be articulated in a program assessment plan.

However, we are getting ahead of ourselves. At this point, we are merely concerned with building the foundation of a program assessment plan. This includes a set of goals, program outcomes, and a matrix in which program outcomes are aligned with specific courses within the program.

Where to Begin:

Everyone who teaches has a reason for teaching. This reason for teaching relates to the person's mission and/or philosophy behind teaching. Just as every person has a reason for teaching, every instructional program has a reason and basis for existing. That is, whether articulated or not, there are program philosophies, visions, and/or missions.

Once we know why a program exists, we can begin to think about the things that we want our students to achieve after having taken courses in or completing the program. These are what we refer to as program goals. Once our program goals are articulated, we can then begin to discuss

what we would construe as evidence that the students are achieving the goals; in other words, we can develop program outcomes.

Let's examine program goals and outcomes in more detail.

Program Goals:
A program goal is a general statement of what a program intends to accomplish. It answers the question "what impact do I want this program of study to have on students, that is valued, and will still be there years after the program has been completed?"

What Attributes do Program Goals Possess?
Broad -- program goals are broad in scope and often use somewhat vague language (but not so vague that one cannot understand what it is you're striving for). This allows people to interpret differently how the same goal may be achieved.

Long-range -- the focus of the goal is after the program is completed. The student may develop the knowledge or skill while in the program, but it is something that will stay with them for years.

Demonstrable -- you may not be able to measure (assess) if a student is achieving the goal, but the goal in some manner is capable of being demonstrated.

For example, you may want to instill in your students an appreciation for opera. That is not something easily measured. Howev-2(n)-101(t(he)40h 0 Tw 2.1 0 Td (.)0(0( )-101(t(h(T)( )]Thi)-2(ng)10(e(

the Political Science Department at the University of Southern Indiana
(http://www.usi.edu/libarts/polsci/goals.asp):

Having completed or taken courses in Political Science, students will . . .

1. be knowledgeable of the normative political theories that are the basis of the American political system.

2. be knowledgeable of the most significant empirical theories in each of the major areas of political science.

3. be able to articulate the strengths and weaknesses of contemporary political systems.

How to Write a Goal Statement

There is no set algorithm for generating goal statements. Basically, what you want to do is answer the question presented at the beginning of this section (what impact . . . ?). This, however, is much easier said than done. Here are a few suggestions that might make the goal writing process go more smoothly:

x Examine the college's mission/vision/philosophy statements.

x

assessment of program outcomes that the strength and weaknesses of student learning in a program as a whole are documented.

Course Outcomes: measurable student performances associated with a particular course. Course outcomes are the assessment vehicle through which information is gathered to improve student learning in a particular course.

General Education Outcomes: measurable student performances associated with what a particular institution has decided will be incumbent upon all students.

It is important to understand that there really is no definitive relationship between these different types of outcomes. In other words, it is entirely possible that an outcome is simultaneously a program outcome, a course outcome, and a general education outcome. It is also possible that an outcome can be a program outcome, but not a course nor a general education outcome. The possible relationships between the three outcomes are illustrated in the figure below.

For example, if one of your program goals is to have your students think critically, then you may have the following program outcome: "students will be able to synthesize justifications for both sides of an argument." It may turn out that Dominican University has decided that all students, regardless of their program, should be able to do this. This outcome is both a program outcome as f exami12(e)4(s)ueogram isumbent upotry10(a)43ahtx

There were some basketball outcomes we articulated that were not selected to be program outcomes; however, we might still want to assess them in the basketball courses. If this is the case, then these would not be considered program outcomes, but they would certainly be considered course outcomes.

Writing Outcome Statements

When writing outcomes it is important to focus on student performance because that is what will eventually be assessed. In this respect, it is also important to think about the outcome as a product -- what the student has learned, not as a process -- what instruction was conducted. In order to keep things simple and manageable, strive for one performance behavior per objective. Sometimes it will seem logical to combine certain behaviors (list and describe, for example), but this will only cause problems later on during the assessment (what if the student can list the items, but cannot describe their function?).

Essential Attributes

When writing an outcome statement, there are a couple of characteristics that must be included. One of these is the performance behavior. That is, the competency of the student must be described in measurable performance terms. The second is the criterion. This is the acceptable level of performance. Oftentimes, full mastery or 100% achievement is implicit within the performance statement, when this is not the case, then the acceptable level of performance must clearly be stated.

Other Attributes

Although not essential, it is beneficial to indicate the target of the outcome. However, the

In the list above, the items on the left are outcomes and the items on the right are the corresponding levels of Bloom's Taxonomy for that particular outcome. Every cognitive outcome that you write should correspond to a particular level of Bloom's Taxonomy. You do not always need to strive for the highest levels. Rather, the level you select should be based on what it is that you want your students to do. If simply being able to recall something is what you want them to do, then write the outcome at the Knowledge level of Bloom's Taxonomy.

<u>Common Mistakes</u>
When writing outcome statements, people typically make four mistakes: 1.) the outcome is too

Good:
Students will be able to categorize a molecular representation as either polar or non-polar.

Steps for Writing Program Outcomes
The following is a 5-step model that you may find useful for deriving program outcomes from program goals. When using this model, it is important that as many members of the program as

2. All students seeking a chemistry degree will pass a program administered end-of-program test that assesses knowledge and understanding of fundamental chemistry concepts. Goal 1

3. On a quiz or exam, students will be able to solve the majority of word problems given to them. Goal 2

4. Students will be able to draw a valid conclusion about a particular topic from the provided experimental data. Goal 2

5. Students will be able to correctly identify common laboratory equipment. Goal 3

6. Student will be able to state the names of different laboratory instruments. Goal 3

7. Student will be able to demonstrate the proper use of different scientific instruments. Goal 3

8. Students will be able to execute a laboratory activity of their own design to address a novel problem. Goal 3

9. Students will write an essay in which they examine a specific positive impact that chemistry has had on the human condition. Goal 4

10. Students will be able to state at least 5 chemistry advancements that have proved significant in improving the human condition. Goal 4

CREATING A PROGRAM OUTCOME MATRIX

Once the set of program outcomes have been articulated, the next step is to map the program outcomes to particular courses in the program. Although this can be done a number of ways, I find a 02 Tw -26o

some manner. Someone in the program, the chair perhaps, could take responsibility for administering the exam outside of any course or the members of the program might decide to incorporate it into one of the courses.

One question that might come to mind is "are these the only outcomes that are assessed in these courses?" The answer is no. Remember, the outcomes listed in the matrix are program outcomes. These are the indicators that will be used to assess the program with respect to improving student learning. There might be other outcomes that members of the program feel are important, but were not selected to be program outcomes. For example, the instructors for course CHM 200 feel that it is important for their students to be able to properly name organic compounds. This is not a program outcome (it will NOT be used to make generalizations about student learning in the program), but it is important and will be assessed -- it is a course outcome for CHM 200.

All of the courses in the matrix below will have associated with them course outcomes. Some of these will also be program outcomes, most of them will not.

CONCLUSION

The articulated program goals, the derived program outcomes, and the program outcome/course matrix together serve as the foundation of a program assessment plan. The program assessment plan allows each program to decide when a particular outcome will be assessed and where it will be assessed (the particular course if it is also a course outcome). An important point to consider is that not all courses associated with a particular program outcome need to participate in the assessment of that outcome. All that is needed is large enough samples from which valid generalizations about the quality of student learning in the program can be made. Therefore, it is better to include more than one course when collecting program assessment data, but including all courses associated with the outcome might not improve the quality of the assessment. In fact, it might even hinder future program assessments.

One thing that we have not addressed is a proper timeline for program assessments. This will be addressed separately once all the programs have reached the level of program outcomes/course matrices.

A.   <u>Chemistry Program Outcomes Aligned with their Corresponding Program Goals</u>

Having completed or taken courses in Chemistry, students will . . .

1. have developed an understanding of the fundamental concepts of chemistry in order to be prepared for higher-level courses and/or employment in a chemistry career.

   x Eighty percent of all students enrolled in a particular chemistry course will score above the 60th percentile on the ACS standardized final exam appropriate for that course.

   x All students seeking a chemistry degree will pass a program administered end-of-program test that assesses knowledge and understanding of fundamental chemistry concepts.

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B.   Program Outcome/Course Matrix

Chemistry

Course Program Outcome	CHM 100	CHM 120	CHM 200	CHM 220	CHM 300	CHM 320	CHM 400
1 Eighty percent of all students enrolled in a particular chemistry course will score above the 60th percentile on the ACS standardized final exam appropriate for that course. Goal 1	0	0	0	2	2	2	2

2
All students seeking a chemistry degree will pass
a program administered end-of-program test that