

# Assessment *in* Practice

## Designing & Aligning Learning Outcome Assessments for Academic Programs:

Proficiencies that Students are Expected to Demonstrate —  
Learning Institutions are Expected to Authenticate

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If you have been involved with academic assessment in higher education, there is a good chance you are familiar with the learning outcome language that reads,

*‘The Student will be able to...’*

Learning Outcomes are used to succinctly communicate the knowledge or abilities a student should possess after having completed a specified curriculum or academic program. Accredited learning institutions are typically required to identify expected learning outcomes for their degree programs as well as provide evidence that the students who complete the program are genuinely achieving those outcomes. With this learning expectation in mind, we could say then that,

*‘The Institution will be able to assess whether a student has achieved their program learning outcomes’*

The purpose of student learning outcome assessments is for “using evidence for determining if students are achieving the desired outcomes, and for improving instruction based on the findings of assessment” (Judd & Keith, 2012, p. 81). Institutions, however, go about this assessment process in a variety of ways, yet there are some common principles to uphold and pitfalls to watch out for. This Assessment in Practice aims to focus on how one institution assesses their **Program Learning Outcomes (PLO)**, with specific attention on the importance of designing properly *aligned* assessments.

## PROGRAM LEARNING OUTCOMES AS AN ACADEMIC PRODUCT

The importance of assessment goes beyond external accreditation standards by first being a matter of internal integrity for an institution. Relatedly, and as noted by Kuh et al., (2015), “public confidence in the quality and integrity of American higher education is indispensable” (p. 12). Given the weight that a program hangs on its respective PLOs, and the importance of assessing those learning outcomes, a clear understanding of PLOs is fundamental. So for those who may be entrenched in the world of assessment, as well as those whose paths might only intersect with it on occasion, you may find the idea of a PLO as an ‘academic product’, to be a helpful way for explaining and conceptualizing its function and purpose.

Like most any business transaction, involved is an agreement in which one party offers goods or services in exchange for a payment of agreed upon value. Likewise, students hopefully gain the intended skills and knowledge (the product) by investing their time and efforts enrolled in a program and successfully completing the program’s curricular assignments (the payment). By the end of a student’s program, s/he should not only be rewarded with a diploma, but should also have ‘acquired’ the Program Learning Outcomes that are packaged into their respective degree. If students graduate without having acquired the PLOs, then a concern would be whether the institution has held up its side of the bargain. If the student has acquired a diploma without having achieved the related learning outcomes, arguably the student may have been shortchanged (along with whomever else may rely on the credibility of that student’s degree).

This analogy can serve as an especially helpful means for explaining PLO’s to someone unfamiliar with the assessment discipline, as well as provide another facet of understanding for assessment veterans. Like most analogies though, there are a number of troublesome implications when the concept is overextended. In the case here, the analogy is not intended to imply that the role of a student can be reduced to that of a customer (doing so invites a number of problems, such as the conflict of marking students’ test answers wrong if one is of the mindset that the customer is always right!). An appropriate application of the analogy though can be seen in the following crucial assessment question:

### **Are graduates from the program achieving the Program Learning Outcomes?**

[or] *Have we made good on our promise to deliver the ‘goods’ to students who have paid the cost of successfully completing their program?*

## GRADES VERSUS ASSESSMENT

Before going any further though, it’s worth speaking to the assessment pushback often voiced by faculty. Namely that student grades are already evaluations of student learning, so ‘assessment’ as a separate and additional process is an unnecessary redundancy at best. There are a number of rebuttals to this understandable line of reasoning (See Suskie, *Assessing Student Learning*, 2009, p. 10), but a thorough discussion of the issue is beyond the purposes of this piece. However, a brief response is offered here since designing aligned

## Definition of PRODUCT

(1a) : something produced; especially:  
COMMODITY

(1b) : something (such as a service) that is marketed or sold as a commodity

(2) : something resulting from or necessarily following from a set of conditions

<https://www.merriam-webster.com/dictionary/product>

assessments necessitates some understanding of the qualities that distinguish course grades from findings procured through learning outcome assessments.

If a selection of student grades were examined for a particular course, one could reasonably expect that the grades corresponded with students' knowledge of the course material. So why add another layer of assessment? Isn't there an underhanded insinuation here regarding faculty competence by suggesting that course grades alone are inadequate? Perhaps that argument could be made, but in doing so it conflates the criteria and purposes driving the respective evaluations. The assessment of a PLO has a much broader scope than the concepts taught by a professor within a course or the skills to be demonstrated through a single assignment. The PLO assessment may hone in on proficiencies that are expected to be demonstrated in a course that is primarily focused on an entirely different area of expertise. For example, if a program requires that a student be able to write in APA format, then most any upper-level course that involves a significant writing assignment could be used to assess students' APA formatting proficiency. The ability to write in APA style is likely to be a peripheral concern though in upper-level classes. The professor in a Psychological Theory course is likely to see the course grade predominantly as a reflection of her students' demonstrated understanding of psychological theories rather than their fluency in APA formatting. In contrast, the assessment for this PLO would primarily be concerned with representing students' proficiency for APA formatting. The subject matter of the course then is tangent to the targeted learning outcome, serving instead as a more contextual backdrop.

*The possibility that students may attain course-level outcomes, but not broader program-level outcomes, is a compelling rationale for the inclusion of assessment in distinction to grading. It's a matter of alignment between the course curriculum and the learning outcomes for the program.*

Additionally, if assessment results indicate that students are not learning a PLO, then part of the follow-up diagnostic process would be to examine whether the courses in the respective program are providing a curriculum that is adequate for students to acquire the PLO. Students' grades may be an accurate indicator of their mastery of the *course* curriculum, but it's possible that the course itself is not supporting the PLO. The possibility that students may achieve the course-level outcomes, but not broader program-level outcomes, serves as a compelling rationale for the inclusion of assessment in distinction to grading (see Figure 1).

## Grading = Assessing?

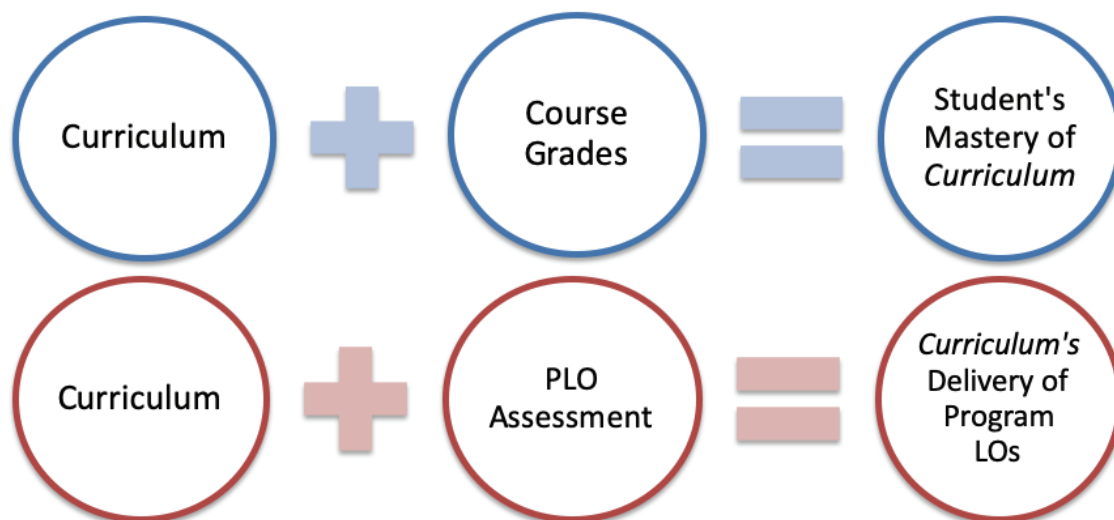


Figure 1. A comparison of the aims of grading versus assessing student work.

The potential for this discrepancy in student performance is not a slight against the faculty member teaching the course; rather it's a matter of alignment between the course curriculum throughout the program, and the learning outcomes for the program. Either the curriculum needs to be adjusted to better support the PLO, or the PLO needs to be modified to fit the aims of the program's curriculum.

### Learning Outcomes for Counseling Program

1. **Synthesize Theories**
2. **Diagnose**
3. **Conduct Research**
4. **Develop Treatment Plan**
5. **Incorporate Ethics**

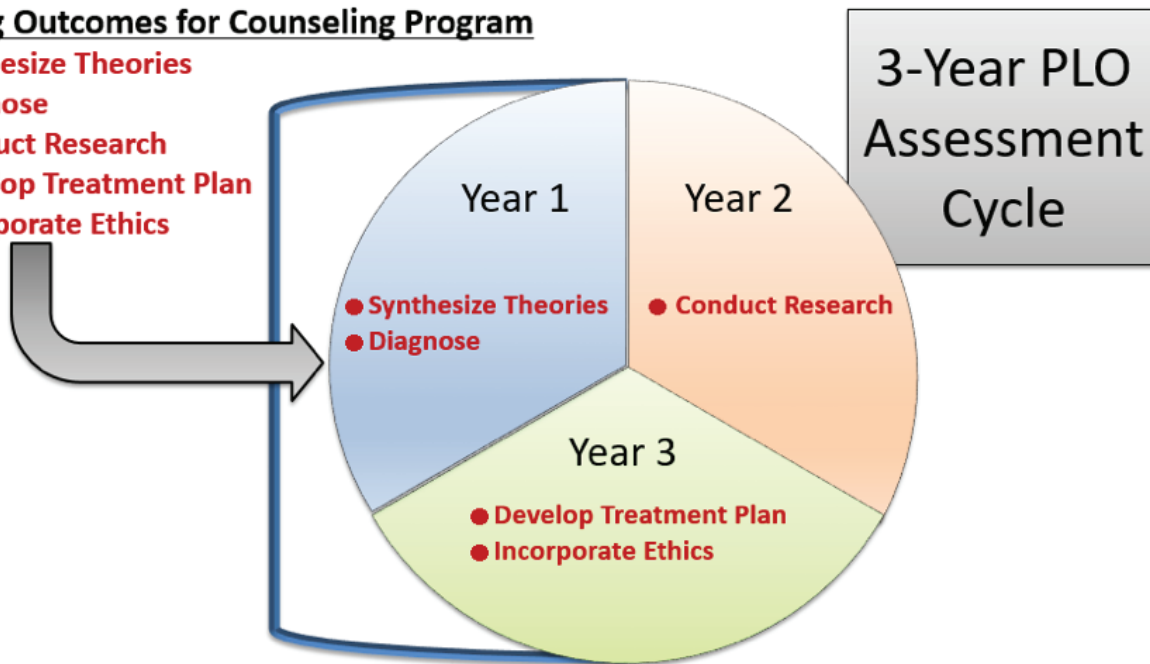


Figure 2. A set of Program Learning Outcomes assigned to a year across a three-year cycle.

Program Learning Outcomes are broader than the more packaged knowledge outcomes that are delivered and tested at the course-level. The breadth of content covered by PLOs requires a great deal of program-level coordination in order to efficiently achieve meaningful assessment findings. Even within the more focused course content though, most tests do not exhaustively list every possible question that could be culled from the course curriculum, but instead use a sampling of questions to gauge a student's overall understanding. In similar fashion, PLO assessments (at this writer's institution), are not designed with the intent to evaluate the entirety of the PLO's knowledge expanse in one fell swoop. Instead, a systematic 'sampling' of the subdomains of knowledge within the PLO parameters are assessed on an iterative basis (see Figure 2). With each iteration of a PLO assessment, a new approach to the assessment is taken in order to best triangulate the results. If the same assignment and criteria are used each time, then the findings may be more of a testament to a course learning outcome rather than a program learning outcome. For example, a PLO related to a medical student's diagnostic skills could be assessed by using a case study assignment in a geriatric course. Although this approach would provide some evidence of knowledge mastery, if the PLO assessment exclusively relied on repeating this particular design (using the same assignment), the overly narrow parameters would prevent even the best student performance results from being sufficiently persuasive. Evidence for students' attainment of a PLO is significantly strengthened however when it involves a cross-section of curricular content and

contexts, e.g., findings gleaned from multiple courses and from different types of assignments. In the example here, a more expansive assessment scope should still target medical students' diagnostic skills, but it would do so in more diverse content areas, perhaps by using different courses to broaden the range of patient populations (e.g. pediatrics). Additionally, examining demonstrations of students' competency through more varied assignment contexts, such as a conducting a live patient intake, or using lab results to guide diagnostic reasoning, or providing a rationale for differential diagnostic decisions, are examples of diversifying the PLO assessment in ways that would promote more comprehensive and reliable PLO evidence.

## ALIGNING KNOWLEDGE DOMAINS

In order to effectively assess the intended learning outcomes, it is critical that the subdomains of knowledge are aligned with the overarching PLO, and that the assessment design itself is targeting student performance that aligns with the subdomain of knowledge intended for evaluation. Said differently, to find what we are looking for, we need to be sure that we are digging in the right spot and that we are using the right tools. This may involve stepping back in order to, “check your assessment methods against your goals. Are you really assessing what you hoped to achieve?” (McKeachie & Svinicki, 2010, p. 73).

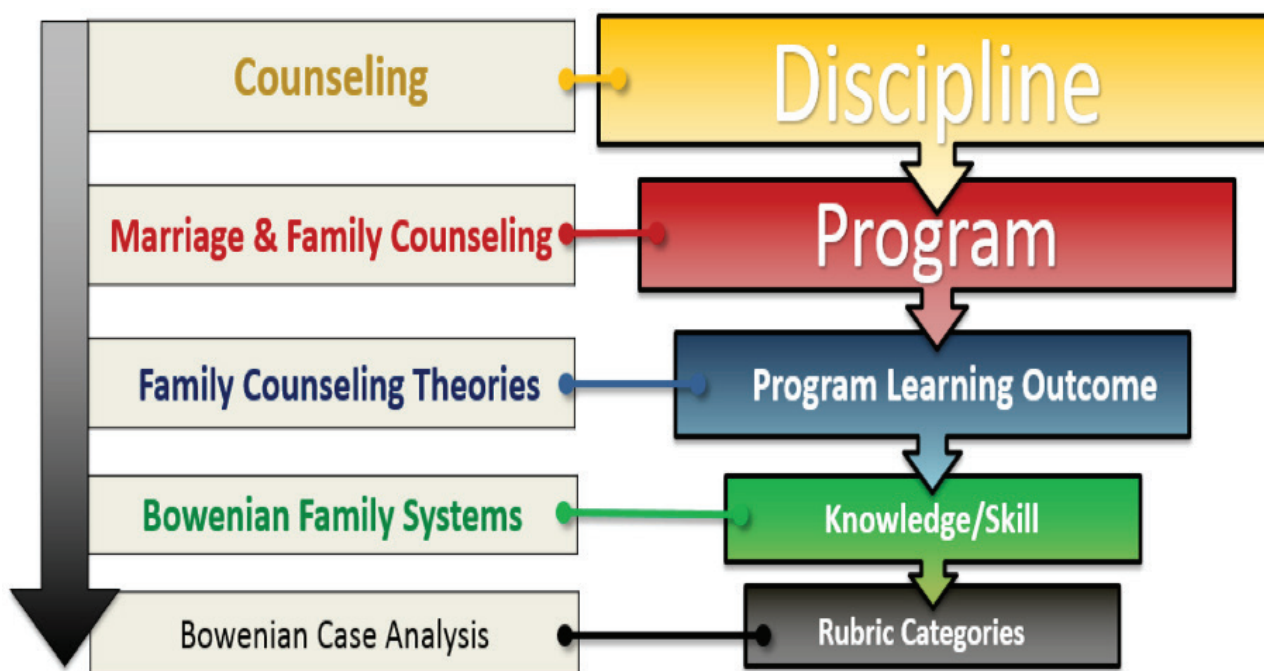


Figure 3. Hierarchy of knowledge bases from broad to narrow (listed top to bottom), with each level paired to a curricular example.

As can be seen in Figure 3, a program or degree of study may be part of a larger discipline, and within that program, a number of Program Learning Outcomes are defined as representing the knowledge domains to be learned by completing that program. Each PLO consists of sub-domains of knowledge and specific skill-sets which can be further narrowed for assessment purposes by using an assessment rubric that targets underlying micro-skills or units of knowledge.



As noted previously, most exams are not an exhaustive review of all the content expected to be learned, but instead they represent a sampling of the content which is then evaluated as an indicator of a student's general understanding of the material. If nearly all the students consistently do poorly on the exams though, naturally it bears asking whether the course instruction is genuinely preparing students for the tests, or if there may be a misalignment elsewhere. Intuitively this is important as it would be false to award students' grades if there is disconnect between the learning content and the content used for testing. Likewise, assessment alignment must also be given this type of scrutinizing attention.

If the concepts evaluated through grading examinations are not found in the class lectures, notes, coursework, or assigned readings, then the student grades will more likely misrepresent their authentic mastery of the learning outcomes. Applying this academic misalignment issue to program-level assessment, care should be given that we do not lose sight of the larger picture as the assessment zooms in to target more specific skills or knowledge. In moving from grand to granular, each subsequent layer of knowledge should narrow in scope while also staying within the parameters of its parent domain.

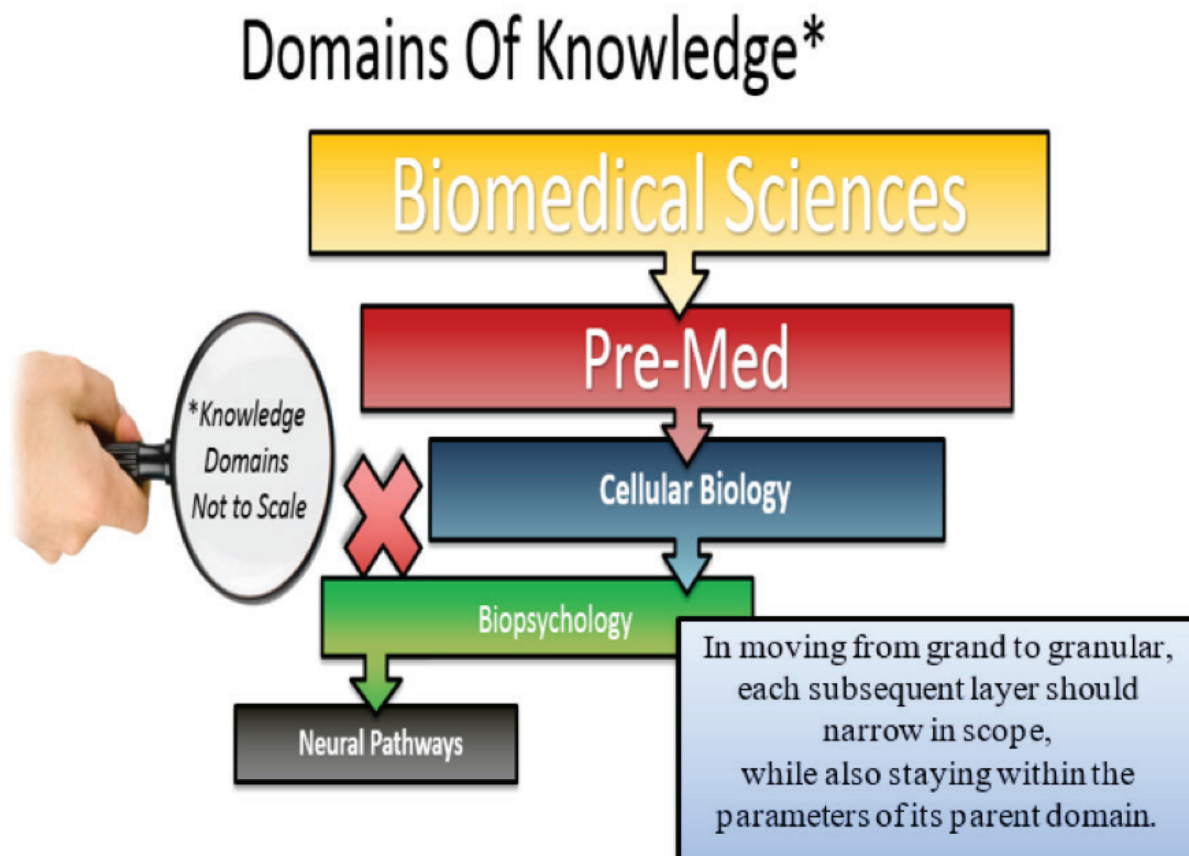


Figure 4. Example of a narrowing knowledge hierarchy that demonstrates a potential misalignment.

Much like the childhood game of Telephone (or a modern variant, *Teleestrations*), in which a statement is passed along a number of times from one person to

the next, there is a risk of the original meaning being compromised with each succession or transference. Even a few rounds of slight rephrasing can drastically alter the original meaning. Likewise, as more granular means of assessing student performance are selected, there is the potential for the assessment to fall outside the scope of the PLO, resulting in findings that fail to provide authentic evidence of students' PLO competency.

As illustrated in Figure 4, Pre-Med is a program that could be included within the larger discipline of Biomedical Sciences, and Cellular Biology is an appropriate subdomain of a Pre-Med program. However, even though Biopsychology is an area of knowledge that overlaps with Cell Biology, it also includes a substantial body of knowledge outside the scope of Cell Biology. Consequently, even though the concepts regarding neural pathways appear to fall within the domain of Biopsychology, it remains largely outside the intended domain of Cell Biology, thus resulting in a misaligned assessment design.

#### WORD OF CAUTION:

It is recommended that assessment designers review the levels across the assessment design with particular attention given to any steps that rely on markedly distinct but overlapping knowledge domains (as described above), as this more readily allows for focusing in on a knowledge area that falls outside the assessment purview. For application purposes, one way this type of misalignment issue may occur is when selecting a specific area of knowledge to assess within a PLO, and selecting a course for the assessment that involves students demonstrating select skills related to the assessed PLO, but also other skills that are outside the PLO. Quite often courses support more than one learning outcome as well as knowledge beyond what is being explicitly assessed. In light of this, there is all the more reason for reviewing the alignment before implementing the assessment design. As shown in Figure 5, each subsequent level within a program curriculum represents respective layers of learning outcomes.

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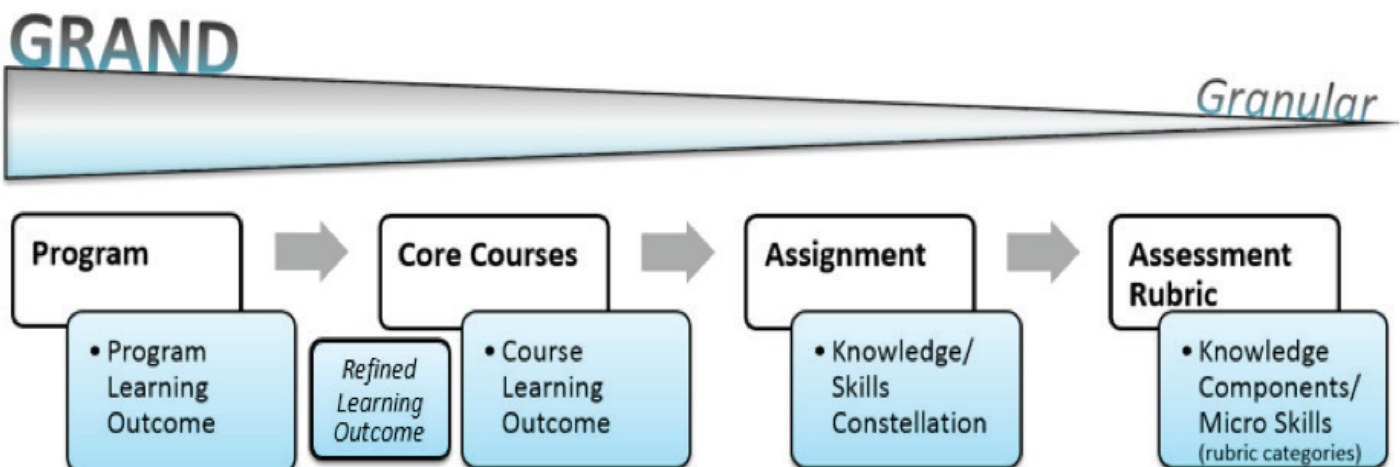


Figure 5. Example of a narrowing curricular hierarchy that demonstrates a potential misalignment.

To better ensure proper assessment alignment, it is suggested that the connections across each level are examined. For example, does the selected assignment include instructions that explicitly require the student to demonstrate

the skills listed in each of the assessment rubric categories? In addition to this more granular inspection, it is worthwhile to zoom out in order to review the assessment design from a grander vantage point. This broader perspective is less concerned with the logistics of the assessment and how each level is aligned with the level above and below, but instead considers the design end points. For example, investigate whether the rubric-level categories list skills that fall within the scope of the PLO (and is not better addressed by another PLO within that same program). If they are not aligned, a next step is to investigate where along the assessment progression did the alignment fall off track.

### Aligning the Program Learning Outcome and its Focused Learning Outcome

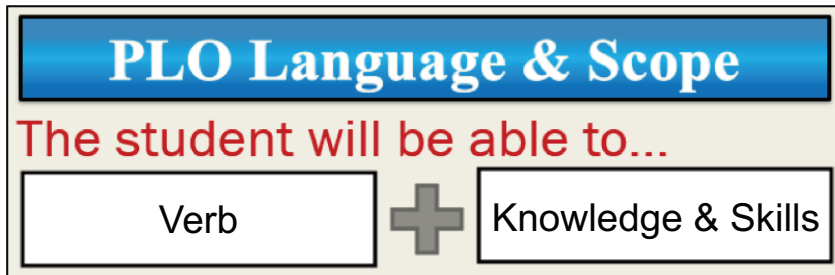


Figure 6. The major components of a learning outcome include a standard introductory phase, followed by a verb and its direct object.

As noted previously, the PLO is considered too broad to fully assess in one assessment using a single assignment. So, with each iteration of the PLO assessment, a more narrowed knowledge range is selected from within the scope of the PLO. For the purposes of assessment, this subsumed competency area is identified in the format of a question, which this author's assessment team calls the 'Research Question' because the stated LO begins with the question, 'Is the student able to do X?'. This Research Question could also be understood or described as a Focused Learning Outcome (FLO). Ensuring alignment between the PLO and the FLO can admittedly be a challenge, but it is considered an essential conceptual step in safeguarding alignment. After determining a PLO to be assessed, a next step is drafting the FLO, and the rest of the assessment should be designed to adequately answer whether students have adequately demonstrated the FLO.

### KNOWLEDGE & RIGOR

As noted earlier, the PLO is structured with the leading statement, '*The student will be able to...*' followed by a verb and related content (see Figure 6). This general arrangement is consistent with the prominent learning outcome literature, such as Bloom's Revised Taxonomy (Anderson et al., 2001) or Marzano's taxonomy (Marzano & Kendall, 2008). Two major pieces then that need to be aligned between the PLO and the FLO are the Rigor and the Knowledge Domain. This is somewhat an oversimplification, but these two components address the content that students should know (Knowledge Domain), and the level at which they should demonstrate mastery over the content (Rigor).

Following the introductory PLO phrase is the statement's leading knowledge-verb. This initial verb addresses the PLO's Rigor and should correspond to a level



from the designated taxonomy of learning outcomes (e.g., Bloom or Marzano’s Taxonomy). Finally, the remainder of the PLO is the object of the verb which represents the Knowledge Domain from which the expected Content/Skills are derived. For example, the ability to **Comprehend directions for repairing a machine** is less rigorous than the ability to **Execute directions for repairing a machine**. Comparing these two PLO wordings shows how different levels of rigor (Comprehension and Application), may be applied to the same approximate subject matter (machine repair).

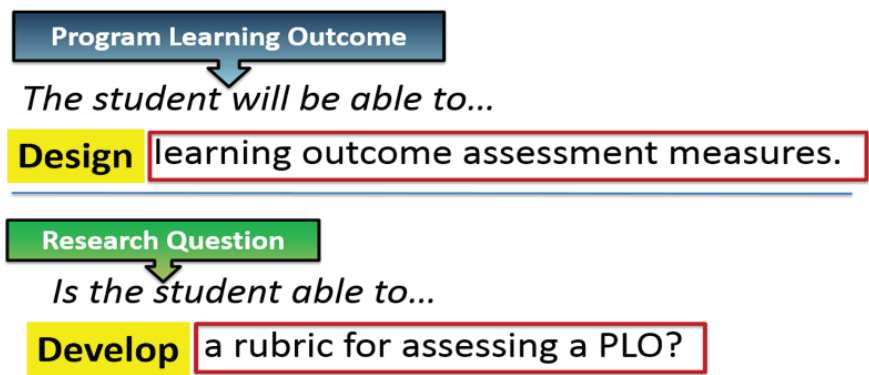


Figure 7. Example of a Program Learning Outcome and related Focused Learning Outcome or Research Question.

Students’ achievement of a PLO can be evidenced through assessing a related FLO or Research Question (RQ). The standard phrasing for all of our RQs reads: ‘*Is the student able to...?*’ In keeping with the PLO structure, the second component is the leading knowledge-verb which addresses its rigor. The leading verb for the FLO/RQ does not need to be the same word as the one used in its parent PLO, but both verbs should be of equivalent level in accordance to Bloom’s hierarchy (or the taxonomy used at your institution). The remainder of the FLO/RQ is the object of the verb, which represents the Knowledge Subdomain derived from the PLO. As demonstrated in Figure 7 and Figure 8, the knowledge or skills specified by the FLO/RQ should align with the PLO, but should also narrow the assessment scope, yet retain a similar level of rigor.

PLO & RQ Alignment	
The following PLO could be meaningfully assessed by the FLO:	
PLO: ‘The student will be able to <u>design</u> learning outcome assessment measures	
↓	
FLO: Is the student able to <u>develop</u> a rubric for assessing a PLO?	
<b>Rigor Alignment</b>  <b>PLO Verb → Design</b> <b>FLO Verb → Develop</b>  Both the FLO and the PLO expect for the student to engage the content matter at a creative level, and so the RQ rigor is aligned with the PLO.	<b>Knowledge Domain Alignment</b>  <b>PLO → LO assessment measures</b> <b>FLO → Rubric for assessing a PLO</b>  Because a rubric is a standard measuring tool used for assessing learning outcomes, the FLO aligns with its PLO. Yet a rubric is only one area of understanding from the much larger knowledge domain that the PLO encompasses, and so the FLO adequately narrows the PLO scope.

Figure 8. Explanation of the alignment between a Program Learning Outcome and related assessment question.

## ALIGNING ASSESSMENT LOGISTICS

There are a number of logistical details in the administration of an assessment that also need to be considered from an alignment perspective. For example, a particular course within a program may seem ideal for assessing one of its PLOs, and so a sampling of students' course assignments might be gathered and evaluated, and the findings reported as evidence for attainment of that PLO. This seems straightforward, but what if the selected course is listed as a required class for a number of other programs as well? If the sample of students was not filtered to identify those that are enrolled in the program of interest, the findings will be muddled since it is including students from other programs as well. It is vital that these design details be determined on the front end because it may not always be possible to appropriately filter the data after it has been collected.

Intuitively, we know that it is unfair to assess students on knowledge that is not included in their curriculum or course instruction. Another challenge then is to look out for possible changes made to course lectures, assignment instructions, syllabus, or even revisions in the textbook, as these can all result in findings that are misleading. Such curricular misalignments, in turn, depreciate the meaningfulness of grades as a proxy for students' achievement of the learning outcomes. These assessment results are generally thought of as an underrepresentation of student's knowledge, but it is also worth keeping in mind that a misalignment can result in an overrepresentation as well, or an inflation of students' actual understanding, which would mask academic deficiencies.

At Liberty University, each submitted PLO assessment design involves the following items to be addressed, regardless of the originating discipline or academic department. These items are listed with additional descriptions and related prompts that are provided in a template, which in turn is uploaded online to a reporting software licensed through Campus Labs. Each of these components is briefly described in respect to alignment:

### 1. Program Learning Outcome (PLO)

- A statement describing student learning to be achieved through successful completion of the academic program.

### 2. Focused Learning Outcome/ Research Question

- A subdomain of knowledge within a PLO that is selected for assessment. Findings provide evidence of students' achievement of the PLO and provide direction for making program adjustments that will hopefully improve students' acquisition of the PLOs.

### 3. Participants

- Description of the student sample to be selected. Students' course work will be assessed to evaluate for adequately demonstrated competence in the proficiency areas of interest.

### 4. Instrument/Assignment

- The program activity that involves students' demonstration of the knowledge/skills of interest.

### 5. Administration

- Logistical details for describing the process of implementing the assessment (e.g., When, Who, Where...)

*Curricular misalignments can depreciate the meaningfulness of grades as a proxy for students' achievement of the learning outcomes. Misaligned assessment results can be both an under/over representation of student's knowledge, serving to overestimate or mask academic deficiencies.*

## 6. Achievement Target

- The criteria for determining whether the assessment has successfully demonstrated evidence that students are adequately competent in respect to the expected knowledge/skills.

(Completion of the PLO assessment also involves describing the assessment's **Findings**, and if appropriate, developing related **Action Plans**)

## ASSESSING THE ASSESSMENT

Again, while each institution has their own approach to assessing their learning outcomes, hopefully some of the concepts presented here share a number of relatable assessment principles, while also offering enough distinction to provide other institutions a few fresh and helpful insights. Just as we desire for our academic programs to be self-reflective and corrective as they seek to improve the quality of their student's learning opportunities, so should those of us involved in assessment be willing to embrace this same humble spirit so that we might continue to improve our own methods and outcomes. In doing so, we not only promote meaningful academic alignment within our programs, we are also aligning our assessment practices with our programs, and ultimately, with authentic student learning.

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## About NILOA

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- The National Institute for Learning Outcomes Assessment (NILOA) was established in December 2008, and is co-located at the University of Illinois and Indiana University.
- The NILOA website contains free assessment resources and can be found at <http://www.learningoutcomesassessment.org>.
- The NILOA research team has scanned institutional websites, surveyed chief academic officers, and commissioned a series of occasional papers.

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