Recommended Best Practices: Outcomes and Objectives

Academic Quality Assurance, CPS

By Mamta Saxena: Director, Assessment
The goal of this document is to propose a framework for best practices for the development of learning outcomes and objectives. The best practices recommendations presented here have been drawn from research publications, professional associations, and successful practitioners in the field of higher education. The document presents the following two frameworks:

1. A theoretical framework clarifying the need for outcomes-based approach to design where outcomes are defined precisely upfront for targeted assessments
2. A curriculum framework describing the relationship and use of program outcomes, course outcomes, and learning objectives
Conceptual Framework

Introduction

In a supplement document released after the State of the Union address on February 13, 2013, Obama administration proposed the biggest change to federal higher education policy since the Higher Education Amendments of 1972. President Obama called for benchmarks to be set for affordability and student outcomes as criteria for receiving federal student financial aid. These benchmarks aim to reshape American higher education by modifying the accountability system about cost, values, and quality. Likewise, employer surveys highlight the increased demand for a quality workforce for the 21st century knowledge economy: college graduates with not only degrees reflecting meaningful learning but also the ability to apply a variety of acquired interdisciplinary skills such as critical thinking and problem-solving and the ability to learn on the job.

College and universities granting degrees, therefore, have the responsibility to assess and improve the quality of student learning and ensure that graduates acquire the required knowledge, skills, values, and attitudes toward the end of the degree program that will prepare them for work, life, and responsible citizenship. According to the “Committing to Quality: Guidelines for Assessment and Accountability in Higher Education” framework, the foremost goal in committing to quality is to set clear goals for student achievement, which will subsequently facilitate consistent measurement of performance against those goals and collection of evidence to report success and identify areas for improvement.

Nevertheless, according to the Spelling Commission report (2006), “A Test of Leadership: Charting the Future of U.S. Higher Education,” quality of student learning in U.S. is inadequate and, in some cases deteriorating. One of the major criticisms was that higher education degrees comprise of discreet collection of courses with nominal relationship to each other. The report also underlined that students are graduating without the basic knowledge and skills expected of college graduates. Since then, there have been numerous publications validating related issues in higher education such as persistence and student retention, poor alignment of degree programs with workforce requirements in the professional field, and the inadequate assessment of student competencies.
The aforementioned issues have a direct correlation with the framework used by higher education institutions to define, design, implement, and assess curriculum. Most importantly, the heart of the issues lies in how the institutions define the goals or outcomes for the curriculum as they relate to learning, students, and assessment. The Spelling Commission (2006) recommended that the institutions measure and report meaningful student learning outcomes to address the issue of quality and alignment. One way of addressing this issue is by embracing curriculum design approaches that focus on learning outcomes to create student-centered learning environments.

Outcomes-based Approach

The outcomes-based education (OBE) movement started in the 1990’s and has been around for at least the last 30 years. The OBE model can be described as a model in which decisions related to curriculum, pedagogy, and assessments are determined by the learning outcomes that the students must demonstrate at the end of the program or course. In other words, a results-oriented or performance-based model that emphasizes institutional accountability based on student learning. Driscoll and Wood (2007) elucidate that the core purpose of outcomes-based education is to focus on creating student-centered learning environments and improving curriculum and pedagogy at both the institution and the course level.

The introductory narrative answers the question, “Why develop outcomes for assessment and learning?” However, there are misconceptions and legitimate concerns related to the apparently “factory model” approach where it can be perceived as “potentially harmful normalization of learning” with the propensity of being prescriptive for both the learners and the educators: a barrier to creativity and flexibility (Driscoll & Wood, 2007, p. 8). Nonetheless, amidst the negative impressions and debates is the conversation about student learning, which calls for the investigation of the relationship between outcomes and the learning theory and related research: a collective understanding of the nature of learning as it relates to outcomes.

Halpern and Hakel (2003) provide insights about the science of learning for analysis, curriculum design, and development. The authors point to the information overload in the digital age and the need for prioritizing what concepts to teach and to what extent. The prioritization will, subsequently, allow students to put more effort on learning and apply the learning to novel situations. OBE can help students achieve the aforementioned goals by clearly defining the learning outcomes upfront and
aligning them with the learning tasks and assessments. Another concept in cognitive science that offers a compelling cause to pursue OBE is “deep learning” or “expert learning.”

One of the major findings within research in cognitive neuroscience claims that students achieve “deeper learning” when they can focus on predefined, clear outcomes (Bransford & Schwartz 1999; Zull 2002; Entwistle 2009; Willingham 2009). When engaged in “surface learning,” students have difficulty making sense of the unrelated bits of information as they rely on memorization and external motivation, leading to ambiguity and stress. “Deeper learning,” on the contrary, allow students to focus on patterns and relationships driven by internal motivation and metacognition, leading to engagement and self-satisfaction (Entwistle, 2009). In other words, deep learning is a kind of learning that transforms novice into an expert: a learning that faculty possess and would like their students to acquire in the learning process. Among the best practices emerging from the “deep learning” concept is the need to identify overarching goals and outcomes, generative topics, and clear expectations.

Numerous instructional design theories and models delineate the first step in the process as defining clear learning objectives for the learners. According to the First Principles of Instruction by Merrill (2009), the prescriptive design principles demand the selection of an authentic task as learning is promoted when learners are engaged in solving real-world problems. Appropriate task or problem selection is fundamentally dependent upon clearly defined outcomes. When designing guided experiential learning, the first step in the process is the selection of a concrete and stimulating goal. Focus on outcomes allows the design process to plan the teaching and learning, curriculum, and assessment in accordance with the program level (undergraduate/graduate) and goals for the respective discipline. The aim is to prioritize the curriculum content in direct alignment with the knowledge, skills, and attributes that the graduate is expected to be able to demonstrate at the end of the learning experience. Most importantly, it allows the design to establish clarity as the foundation for learning for the faculty, the students, and the institution as a whole.
Outcomes and Objectives

The previous section provided the rationale for beginning the design process by developing targeted outcomes for program and courses. However, it is critical to first clarify the difference between outcomes and objectives. Allan (1996) noted that the curriculum design literature abounds in ambiguous lexicon and the terms objectives, goals, intents, aims, and outcomes have been used interchangeably in higher education. The author claimed that “outcomes may subsume learning objectives, but the two are not synonymous” (p. 1). The meanings and implications related to outcomes and objectives need clarification to establish the accurate use of both terms in higher education, especially when defining the educational intent and assessment strategies at the program, course, and module level. This section will review some of the key issues in an effort to propose the best use of the terms outcomes and objectives.

The term “objectives” surfaced during World War II to support the military training mostly grounded in the theoretical construct of behaviorism proposed by B. F. Skinner. The terminology since evolved from “educational objectives,” to “instructional objectives” and finally to “behavioral objectives” (Allan, 1996). The shift in terminology embodied the movement that changed the focus from: (a) the more general to the specific and, (b) teacher-centered to the student-centered learning paradigm. Mager’s construct brought the learner into the design framework by specifying the definition of objectives as something that the learner is able to do at the end of instruction as opposed to describing objectives in the context of instructional intent or content. (1962). He also defined the critical elements of a good learning objective as one that uses a measurable action verb, specifies the conditions under which the performance would take place, and include the criterion for the success or acceptable performance.

There are many definitions of “outcomes” out there, but the one foundational element inherent in all of the definitions is the significance of placing the learner in the center of the learning process as opposed to the instructor or content. Learning outcomes can be defined as statements that describe the intended purpose of education: the end results of the learning experience, which becomes part of the students’ cognitive or affective schema in the form of attributes. In simple words, outcomes describe what the students should know, understand, and be able to do at the end of the learning experience in a course or program or at graduation (Gagné & Briggs 1974; Brown & Glasser, 1999; Huba & Freed, 2000; Maki, 2004).
What is the Difference?

According to Eisner (2001), outcomes of learning experiences are the result of interactions among the student, instructor, and the content. The author describes them as broad, all-encompassing consequences of learning. In this regard, outcomes are more complex and broader than objectives and they do not meet the inflexible criteria that apply to objectives because:

- They cannot be described as discrete, uni-dimensional concepts with a precise area of application that is bound by an acceptable standard of performance.
- They are not derived from objectives that are directly related to instruction or content.
- They may not necessarily be achieved only after the completion of a course or module as one may have obtained these via prior learning experiences (Allan, 1996).

These characteristics of outcomes qualify them to be able to describe the complex and correlated application of knowledge, skills, and attitudes in ill-structured environments (Jonassen, 1997; Simon, 1978). Ill-structured environments pose poorly structured problems that “possess multiple solutions, solution paths, fewer parameters which are less manipulable, and contain uncertainty about which concepts, rules, and principles are necessary for the solution or how they are organized and which solution is best” (Jonassen, 1997, P. 65). In case of objectives, the focus on a particular behavior and action for a prescribed end result limits the applicability to (a) broader, long term goals of learning and, (b) ill-structured environments. Hence, outcomes are descriptive and cohesive in that they define an end state of a learning experience (knowledge, skills, and attitudes) in a broader context and general sense unlike objectives that are prescriptive and observable, which define the end results of a learning process as specific behavior or action.
According to Northeastern University's (NEU) mission, NEU graduate must not only demonstrate expertise in a given discipline, but also acquire the ability to “create and translate knowledge to meet global and societal needs.” Below is a hierarchical model (Figure 1) to incorporate the mission when designing and evaluating curriculum. Program outcomes stipulate precisely the knowledge, skills, and characteristics that graduates will acquire on the completion of a degree program. Course outcomes, derived directly from the program outcomes, describe those outcomes in a more discrete and concrete manner. Learning objectives are crafted based on the course outcomes to help guide the specific tasks within each learning module. Figure 2 outlines the major differences among the three constructs and Figure 3 lists some of the best practices.

Figure 1: Outcomes and Objectives
<table>
<thead>
<tr>
<th>Description</th>
<th>Program Outcomes</th>
<th>Course Outcomes</th>
<th>Learning Objectives</th>
</tr>
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<tbody>
<tr>
<td>Represent the knowledge, skills, and characteristics applicable in the real world and in ill-structured contexts</td>
<td>Represent the knowledge and skills explicitly in the real world context while the characteristic are implicitly weaved through the course</td>
<td>Represent the knowledge and skills explicitly</td>
<td></td>
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<table>
<thead>
<tr>
<th>Alignment</th>
<th>Institutional mission and discipline's conceptual framework</th>
<th>Program outcomes</th>
<th>Course outcomes</th>
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| Nature | Descriptive: Describe the characteristics of a proficient graduate: integrated, holistic, and long-term | Descriptive: Describe the knowledge or skills of a proficient student after completion of the course; more measurable relative to the program outcomes | Prescriptive: Prescribe a specific measurable and observable behavior or action to be completed by the student at the module level: one-dimensional and discrete |

| Number | 4-8 plus 1-2 for each concentration | Undergrad: 4-7 Graduate: 5-8 | 3-7 per course outcome |

| Assessment | Collection of evidence in an accumulative fashion over the course of the program; indirect | Collection of evidence within a course; direct | Assessed within a module or unit; direct |

| Examples | Assist in the decision-making or policy planning processes that will deliver sustainable, energy efficient systems to the global market | Examine the range of environmental issues that led to the creation of environmental protection and management systems | List the environmental issues in your geographical area |

Figure 2: Comparative Chart
<table>
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<tr>
<th>Best Practices</th>
<th>Explanation/Examples</th>
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<tbody>
<tr>
<td>Interpret the action verb in context; focus on the outcome or objective as opposed to the verb only</td>
<td>Examples: Identify the key factors that led to the revision of Bloom's taxonomy. (focus on lower order of cognition) Identify the relationship between the key factors that led to the revision of Bloom's taxonomy. (demands higher order of cognition)</td>
</tr>
<tr>
<td>Phrase outcomes in present tense</td>
<td>Outcomes describe a characteristic of a graduate will end up with as a result of the learning experience Example: Graduate “create” as opposed to “will create” an artifact</td>
</tr>
<tr>
<td>Use action verbs at or above application level for outcomes, never below</td>
<td>Anything below the application level will be too uni-dimensional and prescriptive and will not represent true knowledge, skill, and attitudes that exist in real-world environment</td>
</tr>
<tr>
<td>Describe action and criterion of success for outcomes</td>
<td>Non-example: Understand the major learning theories Example: Evaluate the learning theories for their relevance to and appropriateness for instructional design practice.</td>
</tr>
<tr>
<td>Objectives should be uni-dimensional and prescriptive</td>
<td>Non-example: Understand different kinds of instructional design strategies in order to appreciate them Example: Identify the different instructional design strategies used in varied online learning environments</td>
</tr>
</tbody>
</table>

**Figure 3: Best Practices**

**Summary**

Program outcomes are drawn from Northeastern University's mission and the conceptual framework for the respective colleges and disciplines. They are developed in collaboration with faculty, industry experts, Deans, and other stakeholders. The mastery of program outcomes is evaluated via evidence collected over the course of the program usually in the form of high-
stake or terminal assessments. Program outcomes are the least specific and measurable but most significant in terms of end-results for students and prospective employers.

Course outcomes are more specific than program outcomes but less discrete than learning objectives. In this regard, course outcomes should never fall below the level of application level of Bloom’s taxonomy. Learning objectives are the most measurable of all and should specify the precise action or behavior to be completed at the end of the learning process or task. Objectives are roadmap for students to achieve the course outcomes. Each learning objective can map to one or more course outcomes. Overall, the three constructs in design will assist in (a) designing a targeted curriculum well-aligned with the university mission and program goals, (b) collecting evidence of learning for assessment purposes, and (c) conducting data analysis and reporting of student performance and success at any given point in time for any given program.
References


