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Bloom's Taxonomy Illustrative Verbs: Developing a Comprehensive List for Educator Use

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Through an analysis of the literature, the authors created a master list of illustrative verbs classified by cognitive level according to Bloom's Taxonomy. The focus is on the writing of instructional objectives that specify learning outcomes and provide a focus on planning, teaching, learning and assessment. The master list was created by compiling Bloom's Taxonomy verbs from multiple academic sources then having this compiled list evaluated by experts in the field. These experts both evaluated the list and resolved any categorical conflicts of the verbs.

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When planning to teach, many educators often focus on the selection of content, teaching method, and instructional materials. Although these are important elements in instructional planning, the entire process is more effective if attention is first directed toward the development of instructional objectives. Well-written objectives describe what students will learn and be able to do as a result of instruction. Gronlund (2004) described useful instructional objectives as those written in terms of the intended outcomes of instruction. When preparing objectives it is important to seek out a frame of reference that clarifies various types of learning outcomes. The authors of this paper used Bloom's Taxonomy as a scaffold for building a comprehensive framework for classifying verbs used to describe learning outcomes at each of the levels of Bloom's Taxonomy.

Bloom's Taxonomy

In 1956, Benjamin Bloom and a group of educators developed a scheme for categorizing educational objectives and published the results of their work in Taxonomy of Educational Objectives: Book 1, Cognitive Domain. Since its first publication, almost 50 years ago, the handbook has been translated into more than twenty languages. This work, commonly referred to as Bloom's Taxonomy, is widely used by educators today to formulate instructional objectives, categorize learning tasks, drive instruction and define assessments.

Bloom and Pre-Service Teacher Training

Educators training students to become teachers often refer to Bloom's Taxonomy during each aspect of the instructional cycle, from planning to assessing instruction. Bloom and his associates developed a system for helping teachers identify the types of learning they can expect from their students. Bloom's Taxonomy outlines six hierarchical levels of cognitive complexity: Knowledge, Comprehension, Application, Analysis, Synthesis and Evaluation. Each category represents an increasingly complex type of cognition sometimes referred to as lower and higher levels of learning. Because the levels are cumulative in nature, each component of the taxonomy builds on the successful completion of the previous levels (Granello, 2001).

Bloom's Taxonomy is established, well-known, comprehensive, hierarchical in design and contains actions verbs which succinctly describe learning outcomes. When pre-service teachers learn about writing instructional objectives, they are typically asked to categorize or label each one according the Bloom's level of cognitive complexity. Well-stated objectives can provide a description of the intended learning outcomes in

performance terms – that is, they identify verbs that describe observable behaviors students demonstrate to show acquisition of the knowledge, understanding or skill described by the objective (Gronlund, 2003). By delineating the performance that they are willing to accept as evidence of learning, teacher candidates learn to provide a focus for instruction, student learning and assessment.

The Value of Using Bloom's Taxonomy in Learning Outcomes Development

Bloom's Taxonomy represents a tool for planning, implementing and assessing instruction. It provides educators with a common frame of reference that clarifies various types of learning outcomes. It illustrates the wide array of learning outcomes that can be included in any given instructional area. Borich and Tombari (2004) found the taxonomy benefits teachers as they plan their lessons. It helps teachers focus on the outcomes, specifically instructional objectives, that they want their students to attain as a result of instruction. The taxonomy gives educators a precise and common language for articulating the intended outcomes of their teaching in terms of student learning (Lee, 1999). McMillan (2004) found the taxonomy to be valuable to today's teachers because it provides a comprehensible list of possible learning outcomes with action verbs that operationalize learning targets. From the taxonomy, sets of illustrative verbs that delineate different levels of learning have been developed (Airasian, 2001; Bloom's Taxonomy, 2002; Borich & Tombari, 2004; Chatterji, 2003; DLRN's Technology Resource Guide , 2002; Gronlund, 2004; Hazari, 2002; Lane, 2002; Lee, 1999; McMillan, 2004; O'Malley & Pierce, 1996; Objectives in an Outcomes, 2002; Preparing for Clinical, 2002). These verbs describe the types of responses the students are to exhibit as evidence of learning. They represent samples of observable behaviors appropriate for

each level of cognition and offer precision to the description of learning targets. They can help teachers clarify their intended learning outcomes, provide a basis for planning and set the stage for both teaching and assessment.

Categorizing Illustrative and Conflicting Verbs

The authors of this paper conducted an analysis of the research related to the labeling of learning targets according to Bloom's Taxonomy. The importance of categorizing learning outcomes was addressed by Lee (1999). She believed defining student learning outcomes at various levels of Bloom's Taxonomy was the foundation for the selection and design of assignments, teaching strategies, readings, instructional materials and assessments. By specifying learning goals with precise language and labeling student outcomes, teaching becomes an intentional activity where teachers guide student learning. Gronlund (2004) stated Bloom's Taxonomy provides an established, useful and comprehensive framework for identifying and writing instructional objectives. Using the taxonomy, educators can create a student-centered learning environment that fosters a range of thinking skills, from the recall of factual information to the development of critical thinking and problem solving skills. Bloom's work has proven itself as a flexible and enduring structure to help define cognitive abilities in the classroom.

In this study, as a result of the analysis of learning outcomes, the authors developed a master list of illustrative verbs for each of the six levels of Bloom's Taxonomy. Specifically, the authors analyzed lists of illustrative verbs which describe the different levels of cognitive learning. The verbs studied were divided into the six categories of Bloom's Taxonomy. The level of thinking desired from students in an

assignment is based on the level from which the verb was selected.

In the literature examined, a number of the verbs were consistently assigned to certain levels of the taxonomy and appeared to clearly identify the required thinking skills attributed to a given level; this list is referred to as the preliminary list of illustrative verbs. The authors recruited three expert reviewers to analyze and respond to the verb classifications. These experts hold terminal degrees in the field of education, teach college-level educational assessment courses, and have presented Bloom's Taxonomy research and publications at professional colloquiums. Each expert was given the list of verbs and asked to determine if each was categorized appropriately. If any of the expert reviewers disagreed with verb placement on the list, discrepancies were to be identified and reported to the authors. Results of the analysis concluded all experts were in agreement with the classification system found in the research.

However, as the research continued, a second list consisting of sixty-eight "conflicting verbs" emerged. This list consists of verbs in which the specified learning outcome did not appear at the same cognitive level from list to list or the same verb was used to describe thinking abilities on different levels within a given list. The three expert reviewers were asked to analyze the conflicting verb list and assign each of the conflicting verbs to the most appropriate level and provide a rationale for each choice.

The conflicting verb categorizations were then assigned a numeric value corresponding to the Bloom's Taxonomy category selected for each verb by the experts. Verbs in the Knowledge category were assigned a numeric value of one; verbs in the Comprehension category were assigned a numeric value of two, and so forth. The numeric assignments for the three experts were then averaged for each verb, and the

resulting average was then converted to a Bloom's Taxonomy category based on the aforementioned scale. Average scores were rounded up or down as appropriate. The results of the analysis were combined with the verbs in the preliminary list and are found in Table 1.

Implications of the Analysis

Table 1, Illustrative Verbs Corresponding to the Cognitive Levels of Bloom's Taxonomy, provides a standardized list of verbs categorized in terms of specific types of learning outcomes that can be used as the basis for writing instructional objectives. In planning, teaching and assessing instruction, educators must come to realize there are numerous learning outcomes that should be considered. Although the goals of educational institutions and the nature of instruction determine what specific types of learning will take place, incorporating Bloom's Taxonomy based objectives has historically proven to improve learning-outcome attainment. The authors provide this standardized list as a basis for educators to use in instructional objective development. This list in by no means exhaustive, but it helps to clarify the range of outcomes to consider when preparing objectives for instruction and assessment.

Bloom's system of classifying simple to complex forms of learning has enhanced educators' ability to clarify what we mean by learning and to develop valid indicators of learner achievement. In stating objectives, it is important to include a verb that specifies a definite and observable student performance. These types of statements clarify from the outset the types of responses students are expected to make when they have achieved the objective (Gronlund, 2004). The analysis conducted by the authors has yielded a list of verbs that educators can refer to in stating specific learning outcomes across the six levels

of Bloom's cognitive domain.

Recommendations for Future Research

It is hoped that this list will provide the basis for instructional objective development and assessment for educators at all levels. Readers are strongly encouraged to evaluate the verb category assignment and comment on or critique the categories selected, either directly to the authors or in publication. Additionally, the authors are actively seeking to expand the taxonomy verb list for the benefit of all educators. Any additions to the master list are welcome. Additions sent to the authors will be submitted to the expert panel for evaluation and assignment.

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Table 1

Illustrative Verbs Corresponding to the Cognitive Levels of Bloom's Taxonomy is available at: http://users.ju.edu/rbaker1/BloomVerbList.htm.

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