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Bloom's Taxonomy, A Closer Look

The idea of Bloom's Taxonomy was born in 1948 during an informal meeting for the American Psychological Association Convention in Boston, by Benjamin S. Bloom and thirty leading educators. (Bloom, Engelhart, Furst, Hill & Krathwohl, 1956, p. 4) Although the taxonomy is general referred to as Bloom's Taxonomy, the work is considered a group product that came form many revisions. (Bloom et al., 1956, p. 9) The original work of Bloom's Taxonomy (OW) came in the form of handbook, titled the Taxonomy of Educational Objectives: The Classification of Educational Goals. The Taxonomy of Educational Objectives consisted of the cognitive, affective and psychomotor domain. (Bloom et al., 1956, p. 7) The cognitive domain focused on sex level of thinking skills. The affective domain consisted of five levels that focus on attitudes and values. The psychomotor domain consisted of six levels that focused on physical skills and performance. (IACBE, 2014 & Bloom et al., 1956, p. 7)

The OW was intended to provide a classification of educational goals that would help guide teachers, administrators, specialists and research workers that focus on curricular and evaluation problems. (Bloom et al., 1956, p. 1) The first major task of OW committee was to develop a classification system of the learning objectives in the cognitive domain. The OW committee initially believed that educational objectives were not observable or measurable, unlike objectives in other fields such as the sciences, and therefore educational objectives could not be classified. (Bloom et al., 1956, p. 5) However, the committee agreed that since educational objectives can be viewed in behavior form and behavior of individuals can be observed and measured, a classification could be applied. (Bloom et al., 1956, p. 7)

To fully understand the OW, it is important to define and clarify the term taxonomy as it is used in the handbook. The term taxonomy refers to the classification systems that have made

the Taxonomy of Educational Objectives so popular in the world of education today. (Seaman, 2011, p. 30) The classification system was intended to measure the degree to which student learned and intend educational behavior. (Bloom et al., 1956, p. 12) The committee likened its taxonomy system, to the classification of books in a library. (Bloom et al., 1956, p. 9) The OW's classifications are knowledge, comprehension, application, analysis, synthesis, and 6) Evaluation. (Bloom et al., 1956, p. 18)

The six OW classifications comprise a tiered learning system that teachers used to push students through when implementing an instructional model based on the Taxonomy of Educational Objectives. (Guhlin, Nussbaum-Beach, Knightbridge & Cattell, 2015) Each classification level presented a higher amount of rigor, which required students to think more critically. (McKay, 1956) The OW of Bloom's taxonomy suggested that critical thinking and higher order skills are essential to student development. Essentially, the OW was designed to provide teachers with a linear framework to develop higher order skills and critical thinking in students through the utilization of increasingly advanced questions. (Pual, 1985) the OW's six classifications require increasingly advanced levels of abstract from students as they progressed through the classification levels. (Mckay, 1956)

In the OW, knowledge, comprehension and application are considered lower order thinking skills. While analysis, synthesis and evaluation are considered higher order thinking skills. (Guhlin et al., 2015) Benjamin Bloom comprehensively describes all six classifications in the 1956 New York Times piece, titled: "Introduction to Bloom's Taxonomy". In the piece, Bloom describes; knowledge, as requiring simple memorization or recalling information; comprehension, as advancing beyond simple memorization and requiring students to understand the content; and application, as students' applied use of acquired knowledge to solve a problem

or carry out a task. As we move up the taxonomy to higher order skills, Bloom describes; analysis as requiring students to demonstrate the ability to identify patterns and trends; synthesis as requiring students to pull from given facts to create new theories or predictions, and evaluation as students' demonstration of the ability to assess information, devise plans and make decisions. (McKay, 1956)

Earlier on, many examiners and practitioners began using the OW of Bloom's Taxonomy. (Blooms et al., 1956, p. 22) Over the years, various application of the OW has been found in assessments, curricula, K-12 instruction and higher education (Caputi, 2015) In 2003, Signe Kastberg describes her use of the OW as a framework to analyze and revise tests and instruction as a Mathematics teacher. Kastberg's intent with the application of the OW was to better assess students based on what they were actually learning. Kastberg shared that she, like other teachers, created test haphazardly, which resulted in only testing a limited portion of what her students were taught. To improve her teaching, Kastberg used the OW as an assessment framework to create and revised her assessments. Kastberg believed that through the application of the OW, she created assessments that were effective because her assessments and instruction become more aligned. (Kastberg, 2003)

In 1991, Debroah Gough wrote the report, "Thinking About Thinking", to emphasize the growing importance of developing higher order thinking skills with the rise of technology. Gough's report offered insight to the importance of higher order thinking by highlighting five studies that applied the OW's cognitive classification model in the classroom. Dough believed that instruction that went beyond memorization, drills, and repetition to reinforce higher order skills such as analysis and interpretation would promote excitement and enthusiasm in the classroom and thus improve student achievement. (Gough, 1991) Barry Beyer and Judith Dorsch

(1990) developed one of the five studies covered in Gough reports. Beyer and Dorsch's 1990 study, titled, "Integrating Thinking Skills into the Curriculum" not only identified the important higher order thinking skills that should be covered, but also arrange the skills in the sequence to be taught in the classrooms. (Beyer & Dorsch, 1990) Beyer and Dorsch's model used predefined objectives in all subject areas to maximize teacher adoption. The two researchers also believed infusing games into daily activities of all subjects would improve higher order thinking. (Dough, 1991)

Although the OW of Bloom's Taxonomy realized tremendous use in education, there were a number of critics and concerns. (Kastberg, 2013) Numerous authors, including the development committee of the OW, suggested that the OW assumed that learning was linear, followed a hierarchical process, required mastery of lower cognitive level before students could move on to higher levels, and could not overlap cognitive levels. (Blooms et al., 1956, p. 2 & Guhlin et al., 2015) However, other authors disagreed that learning follows a linear, sequential and hierarchal approach. (Amer, 2006)

Additionally, critics of the OW questioned the taxonomies alignment to K-12 education. Critics believed that excess use of the term curriculum in the final version of the OW, suggested that the work was more targeted to the college level and therefore, K-12 educators and administrators may find it difficult to understand and use the system. (Seaman, 2011) In addition, author Robert Wilhoyte suggested that the meaning and goals of the OW were unclear and presented interpretation concerns. (Wilhoyte, 1965) Other critics attempted to limit the number of classifications and present alternatives. Following a statistical study that examined the hierarchical nature of the OW, William Miller, Jack Snowman and Takeshi O'Hara, presented a

category cognitive model. Their study presented that the six cognitive levels could be reduced to concrete intelligence and applied intelligence. (Miller, Snowman & O'Hara, 1979)

Among many criticism and wide use, it was not until 2001 that the OW of Bloom's Taxonomy saw a significant change. (Guhlin et al., 2015) David Krathwohl, professor of Syracuse University, with the help of Lorin Anderson and other cognitive psychologists, revised Bloom's Taxonomy in 2001. (IACBE, 2014) Krathwohl proposed a newly defined model that advanced the OW from focusing solely on nouns to focusing on verbs and nouns. The revised version of Bloom's Taxonomy (RW) was created to improve the original version's lack of multidimensional, depth and flexibility. (Krathwohl, 2002, p. 213) According to Krathwohl, the RW includes the knowledge and cognitive process dimension. The knowledge dimension includes, factual, conceptual, procedural and metacognitive knowledge. Additionally, the proposed cognitive dimension revised the six original classifications (knowledge, comprehension, application, analysis, synthesis, and evaluation) to remember, understand, apply, analyze, evaluate and create. (Eber, 2007 & Krathwohl, 2002, p. 218) In the RW, the knowledge dimension addressed the noun component of learning objectives, while the cognitive process dimension addressed the verb components. (Krathwohl, 2002, p. 214)

The RW of Bloom's taxonomy provides as classification table. In this table the knowledge demission represented the vertical axis and the cognitive dimension represent the horizontal axis. (Krathwohl, 2002, p. 214) Together the cognitive and knowledge dimensions worked to form a two-dimensional table that can more accurately classify learning objectives, activities and assessments. (Krathwohl, 2002, p. 218) As a teacher develops learning objectives and assessments, she or he now considers the noun and verb using the RW. Using the taxonomy table, a teacher can effectively places the learning objective in the cell that represents the proper

knowledge and cognitive process dimension. (Krathwohl, 2002, p. 216) Once learning objectives are plotted, teachers can examine the table to identify relativity, alignment or missed dimensions. (Krathwohl, 2002, p. 218)

Over the years, Bloom's Taxonomy has realized multiple revisions to correct identified areas of deficiencies. (Krathwohl, 2002 & Blooms et al., 1956) Research shows that both the OW and RW of Bloom's taxonomy have been widely cited and used in education. (Seaman, 2011) Nonetheless, authors maintain varying viewpoints regarding Bloom's Taxonomy. While some authors believe the work positively impacted education, others believe that Bloom's Taxonomy is not as impactful and sound as it is perceived to be. Robert J. Marzano and John S. Kendall suggested that Bloom's Taxonomy has had an uneven influence on educational theory and practice. Furthermore, Marzano and Kendal believe that Bloom's Taxonomy has a strong impact on evaluation, but lack thereof on curriculum. (Marzano & Kendall, 2006) Regardless of the position one may hold regarding the impact of Bloom's Taxonomy, it can be strongly argued that both the original and revised work have influenced educators to think and talk about cognitive development and classification.

References

Amer, A. (2006). Reflections on Bloom's revised taxonomy. *Electronic Journal of Research in Educational Psychology, 4*(1), 213-230.

Beyer, B. K., & Backes, J. D. (1990). Integrating thinking skills into the curriculum. *Principal, 69*(3), 18-21.

Bloom, B., Engelhart, M., Furst, E., & Hill, W. (Eds.). (1956). *Taxonomy of educational objectives, handbook 1, cognitive Domain_0582280109* David McKay Company INC. Retrieved from http://www.scribd.com/doc/53565531/Taxonomy-of-Educational-Objectives-Handbook-1-Cognitive-Domain-0582280109#scribd

Caputi, T. (2016, Learning at the top of the pyramid: How penn taught me to think. Retrieved from http://www.huffingtonpost.com/theodore-caputi/learning-at-the-top-of-th_b_7973784.html

Eber, P. A., & Parker, T. S. (2007). Assessing student learning: Applying bloom's taxonomy. *Human Service Education, 27*, 45+.

Gough, D. (1991). Thinking about thinking. *Research Roundup, 7*(2), n2.

Guhlin, M., Nussbaum-Beach, S., Knightbridge, A. & Cattell, S. (2015). Bloom's digital taxonomy. Retrieved from http://edorigami.wikispaces.com/Bloom%27s+Digital+Taxonomy

IACBE. (2014). *Bloom's taxonomy of educational objectives and writing intended learning outcomes statements.* ().International Assembly for Collegiate Business Education. Retrieved from http://iacbe.org/pdf/blooms-taxonomy.pdf

Kastberg, S. E. (2003). Using bloom's taxonomy as a framework for classroom assessment. *The Mathematics Teacher, 96*(6), 402-405.

Krathwohl, D. R. (2002). A revision of bloom's taxonomy: An overview. *Theory into Practice, 41*(4), 212.

McKay. (1956). Taxonomy of educational objectives. vol. 1: Cognitive domain. New York: McKay, , 20-24. Retrieved from Taxonomy of educational objectives. Vol. 1: Cognitive domain

Marzano, R. J., & Kendall, J. S. (2006). *The new taxonomy of educational objectives* Corwin Press.

Miller, W. G., Snowman, J., & O'Hara, T. (1979). Application of alternative statistical techniques to examine the hierarchical ordering in Bloom's taxonomy. *American Educational Research Journal, 16*(3), 241-248.

Seaman, M. (2011). BLOOM'S TAXONOMY: Its evolution, revision, and use in the field of education. *Curriculum and Teaching Dialogue, 13*(1/2), 29-131A.

Wilhoyte, R. L. (1965). *Problems of meaning and reference in bloom's 'taxonomy': Cognitive domain* (Ph.D.). Available from ProQuest Dissertations & Theses Global. (302179166).