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Bloom's Taxonomy Utilized to Develop Differentiated Instruction  
in a Heterogeneous Classroom

by

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## Overview

Historically, educators who have college degrees and continued professional development in their subject area and possibly other disciplines have been teaching and assessing their personally constructed curriculum to their student's specific grade level. Although this format should be the main focus to course curriculum and assessment design, teachers are faced with state and federal mandates where they have to teach a curriculum that was designed from outside sources to include book publishers. The testing industry has grown to a multi-billion dollar industry over the years. Popham (2001) mentioned that state authorities design curriculum goals of "the knowledge and skills students are supposed to master" and had "customized achievement tests created so the test items would mesh better with the state's curricular emphases" (p. 39). There is considerable debate to the various terms that classify tests; for instance, a state test has been referred to as a standards-referenced test and a nationally distributed test has been referred to a norm-referenced test. Criterion-referenced tests are designed, implemented, and administered by the teachers in the classroom to measure the student's ability to attain sufficient criteria to include the levels of mastery and/or competency (Klein, 1990). In addition, some characteristics of criterion-referenced tests include (a) regulates the amount of course material learned, (b) performance is associated to the learning outcomes, and (c) students are aware of the exact information in the design of the test questions and items (Brown, 1989; Griffiee, 1995). Similarly, Popham stated that teacher-constructed tests (a) grade student's progress, (b) encourage students, and (c) assist in the decisions of instruction. Therefore, teachers need to adjust their curriculum and assessments to support state and federal mandates regarding standardized testing. To accomplish this task, teachers essentially should include a higher level of thought into their curriculum by engaging and challenging their students

with application, analysis, synthesis, and evaluation.

Since Benjamin Bloom introduced his taxonomy in 1956, much research has shown that 80% of the teacher population has taught at lower level of thinking: knowledge and comprehension. Some of the action words used in these two lower level areas of knowledge and comprehension are for students to name, list, recall, copy, recite, explain, paraphrase, and discuss many learning objectives. Dettmer (2006) made a comment regarding the taxonomy developed by Bloom and his colleagues that the first levels in the taxonomy of knowledge and understanding assisted educators to assess their students with the recall and translation of materials. However, Dettmer opined “that domination left too little academic time for applications of learned content in new and novel situations” (p. 70). Once students are able to grasp the knowledge and understanding of a topic, they must move on to the next steps to apply their learning in real-world applications, projects, and even sharing in dialogue with others. Some of these action words for higher-level thinking are designed for the student to illustrate, demonstrate, manipulate, differentiate, evaluate, summarize, integrate, and modify the learning objectives. In my experience in the K-12 system, primary and exceptional student education teachers ask lower level questions of their students in day-to-day classroom dialogue as well as in their development of various assessments. Not until the third grade level is when some higher level questioning begins. When a student reaches middle and high school, teachers who create and teach basic curriculum, tend to ask singular factual questions. Teachers need to ask higher level questions to meet the demands of standardized testing and assist students with problem solving skills so they can be successful with real-world application. If there is no extension, or compare and contrast questioning, students are not able to handle assessments with higher-order thinking.

In designing an appropriate curriculum, instruction, and assessment requires that a teacher understands the complex ways their students construct their own literacy and learning environment. If a teacher observes their students in their daily environment, they will be able to have more information about them when trying to focus on what they are missing in their lessons and help them improve through low and high level thinking ideas. Tishman, Perkins, and Jay stated that higher order knowledge is “any discipline consists of more than just facts and skills” (1995, p. 128). It is important for teachers to incorporate higher-order thinking in their curriculum with levels of problem solving, evidence, and inquiry. Tishman et al. (1995) mentioned that for students to progress toward higher-order thinking, teachers need to model this type of thinking in real-world applications, provide explanations, encourage interaction, and allow students to receive feedback.

### **Stated Question**

How can Bloom's Taxonomy be utilized to develop differentiated instruction in a heterogeneous classroom?

### **Rationale and Explanation**

The rationale of this white paper is to improve instruction by challenging the students' level of thinking through the use of Bloom's Taxonomy. If the instruction is improved, hopefully there will be a positive correlation that causes student achievement to increase. Bloom (1956) described his model as a “concise model for the analysis of educational outcomes in the cognitive area of remembering, thinking, and problem solving” (p. 2). Bloom's Taxonomy provides a framework to help an individual move from a low-level thought process to a critical-thinking level (Anderson, 1996; Bloom, 1956).

Once a teacher accepts to place this process of higher-order thinking in to their

curriculum, they can help students build more upon what they know so they can learn new material at a higher level and are able to compare and contrast, create, and evaluate. The class work must be at the proper instructional level, and then be able to work on progressively harder tasks, building upon what they have learned. Teachers also need to increase student learning, by sequencing from simple to complex (i.e., lower to higher level), modeling step-by-step directions, and giving feedback, correction, and practice. When these skills are applied, the students' learning should improve.

### **Review of Literature**

Bloom's Taxonomy model provides a teacher the framework in which the desired level of learning can be properly measured. There are three types of learning domains according to Bloom: cognitive, affective, and psychomotor. Clark (1999) explained that cognitive learning is (a) knowledge, one's mental skills; (b) affective learning is one's attitude, growth in a person's feelings or emotional areas; and (c) psychomotor which is for physical skills. This paper presents additional information on some of Bloom's research in the area of assessments.

In her article, Martin (2004) used charts and graphs to explain the affective and psychomotor domains. In the affective domain, she illustrated the students' emotions, attitudes, interests, attention, awareness, and values as demonstrated by affective behaviors. The psychomotor domain refers to the use of basic motor skills, physical movement, and coordination. Bloom's research claimed there was a lack of experience by teachers in teaching these skills; therefore, the need for teachers to practice this process. Adkins (2004) also spoke of the three overlapping human learning domains. He did mention that the affective domain, because of its complexity, caused people to shy away from its use. This domain produced by the actual teacher, should include role-playing, real-life applications, and collaboration between all

stakeholders in the learning process.

Anderson (1996) wrote in her article about an introduction to Bloom as writer and thinker beyond the boundaries of the taxonomy. Bloom's work covered the understanding that high school standardized tests could be accurately predicted from the same student's third grade test scores. Subsequently, the idea of mastery learning helps to increase the student's level of achievement. Bloom wanted students to move their thinking from *what is likely* to *what is possible*. Bloom also believed that nurture was more important than nature as he believed with the proper environmental conditions; a person could increase their thinking skills (Anderson, 1996).

Manouchehri and Lapp (2003) determined that teachers controlled the students' answers. This caused the students not to reveal enough information about their understandings, misunderstandings, or their competence in the subject matter. I felt that the students in their responses were too vague and did not give too adequate information on their thinking ability. My thoughts are that teachers should include questions that are directed toward evaluating their students' thinking. When a teacher is developing questions for the students' assessments, they need to consider the substance of the learning outcomes; this follows right along with Bloom's Taxonomy. The first level of a knowledge question should state, "What do I want the students to know?" In a comprehension question, the teacher should ask "Do you understand the terminology we discussed?" An application question should read, "How does this new concept relate to the ones that the class has discussed, and how do I assess whether the students realize the connections?" The analysis questioning should ask, "What should I ask to help students focus on similarities and differences among various methods and strategies?" Moving up to a higher level question of synthesis, the teacher should pose this question, "What questions can I

ask that will allow me to determine whether students can use the procedure in context?" Finally to the last high level questioning, a teacher should ask "How do I determine whether they can use the procedure in a novel situation without me telling them?" The format of these questions can give their students an opportunity to communicate their reasoning processes.

Eisner (2000) commented that Bloom's mastery learning was important to promote student achievement through instruction. In this article Eisner talked about the ways to promote cognitive functions and high level forms of thinking as well as how the environment influences the performance of students. Bloom on the other hand, had an alternative thought arranging the ways in which students learn could be promoted. If a student is given the time to master a task, they could gain confidence and motivation in their learning process and then increase their scores on standardizing tests. Much research has been conducted regarding higher-order questioning in regards to student ability to think at a higher level rather than just rely on simple factual information. Teacher-generated, higher-order questioning during instruction helps students in testing compared to student-generated high order questioning (Foote, 1998).

In the overview and rationale, I mentioned about giving students feedback to improve their learning at a higher level. Researchers have concluded that providing useful feedback to students has a positive correlation in promoting learning. Teachers can teach strategies that structure learning environments and in turn, help students to provide their own feedback. This helps the student become an independent life-long learner. Young students can learn how to assess and reflect on their own learning capabilities becoming effective students (Sims-Knight & Upchurch, 2001).

### **Interview**

I chose to research information from a district that is located in the State of Florida which



is a diverse and growing school system. The school district is one of four charter school districts within the state that has the following types of schools: elementary, middle, high, magnet, alternative education, charter, and community; and contains urban, suburban, and rural schools, which serves student populations of economically poor, middle class, and wealthy. The school district's mission is designed to promote and prepare world-class education for every student with the knowledge, skills, and ethics and social responsibility for their future endeavors.

I had the pleasure to meet with an individual who works for this district and wished to be named anonymous. I chose this person because of his experience, professionalism, and drive to help raise the achievement level of district students. This individual has spent a total of 35 years in the field of education holding many positions: 20 years as a classroom teacher; 15 years as an administrator (i.e., 10 years as an assistant principal, 5 years as a principal). This individual's role in curriculum development was to help develop the science curriculum including science fair projects. He worked on various curriculum projects in writing, reading, handwriting, character education, computer technology, and mathematics.

He is very familiar with Bloom's Taxonomy as he was trained in it as part of his undergraduate work at the University of Massachusetts (Amherst) in the early 1970s. Every student who was part of this particular School of Education had to complete a 16-week internship in actual K-12 classrooms. He stated that developing a solid lesson plan, included training in Bloom's Taxonomy; this training continued throughout his professional career. He felt a curriculum that is based on Bloom's Taxonomy has a very important place in teacher training and curriculum development. Teachers today are expected to differentiate instruction in mixed ability classrooms. What better way to accomplish this goal by establishing objectives that address cognitive, affective, and psychomotor development. Effective teachers stress

learning outcomes using observable behavior and assess students based on their learning needs and abilities. The teacher must engage all learners using varied strategies. Bloom's Taxonomy helps teachers state precisely what the student is to accomplish. For teachers to be effective, they need to be trained in Bloom's Taxonomy.

He mentioned that throughout his career, he did not have actual figures or percentages, but from his experience, many of the teachers entering the profession do not have the proper training they need to be effective. Colleges and universities need to do a better job in providing teacher-training opportunities. As a principal, his duties were to be a *teacher of teachers*, which included professional development opportunities to advance teachers from beginners to experienced professionals. Developing effective lesson plans must include the practice of behavioral objectives utilizing Bloom's Taxonomy. He also mentioned that the following were important for which classroom teachers needed:

- plan for instruction,
- diagnose student needs,
- evaluate student progress,
- assist students with individual learning needs, and
- implement a variety of teaching strategies into their daily instruction.

If a teacher understands this process, they would have a better way to be accountable and measure progress of their students. Teachers who use Bloom's Taxonomy are highly effective professionals who demonstrate a mastery level. They generally are the leaders at a school who are known both to students and parents as excellent teachers. Using Bloom's Taxonomy quantifies how the teacher's instructional objectives will be observed, how the learner will be assessed, and evaluates the minimal and maximum level of performance that the learner will

demonstrate.

### **Investigation, Process, Results, and Recommendations**

My personal thoughts of incorporating Bloom's Taxonomy into the curriculum are very important to my school of thought. I believe a teacher's position is to facilitate and transfer knowledge so that their students will be able to function not only in academia, but in the real world. Prior to my knowledge in Bloom's Taxonomy, it was nothing more to me than a clever curiosity that provided vague guidance toward defining the higher levels of thinking to which my efforts to motivate my students were meeting with mixed success. Because of my increased exposure to and comprehension of this process, I have made it a primary resource in the planning of activities in my classrooms. Every level of the taxonomy should be accounted for in the teachers' assessments and designed prior to the presentation of materials. The taxonomy should become the rubric by which all of the activities are measured. What I plan to accomplish is for other teachers to open their mind to this taxonomy for planning, instruction, and assessment through increased explanation and description of the subcategories and the addition of sample sentence starters and potential activities and products.

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