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A Critical Appraisal of Bloom's Taxonomy With Special to Original and Revised Taxonomies

Madassar Mughal[1*], Dr. P.P Goswami[2]

[1*]Research Scholar, Bhagwant University, Ajmer Rajasthan
[2]Department of Education, Bhagwant University, Ajmer

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ABSTRACT

The objective of this study is to compare Bloom's original and revised taxonomies, which have been in use since 1956 and 2001, respectively. Initially, this research describes both the original and updated taxonomies. Second, it begins by outlining the main objections to Bloom's first taxonomy. Thirdly, it explains some objections to the updated taxonomy. Additionally, the article concludes the criticisms with a number of broad supplementary criticisms. In addition, the study provides a chart that outlines all of the main criticisms. Lastly, some recommendations are made for people who frequently utilize Bloom's taxonomy in their research.

Key words: Bloom, Taxonomy, Revised Taxonomy, Original Taxonomy, Criticism, Critical Evaluation.

1. Introduction

Bloom's taxonomy is an outline developed to classify educational objectives according to both explicit and implicit cognitive skills and abilities. It is believed that this taxonomy is one of the most important frameworks that help shape curricula in the twenty-first century. Similar to this, a search engine for the term "Bloom's taxonomy" yields almost 817,000 results. As time passes, Bloom's taxonomy endures and endures. In addition to its vastness, it has been interpreted, developed, and elaborated in a variety of ways. Numerous comments and implementations that differ in some aspects are offered from drafting work to expanded instructions as a consequence of searches and studies on the original taxonomy. One revision is acceptable despite the variations (Forehand, 2005).This revision was designed by an old student of Bloom, Lorin W. Andreson and David R. Krathwohl (2003), who is one of the designers of the original taxonomy.
Bloom's Taxonomy has been revised in 1999 by Dr. Lorin Anderson, a former student of Bloom's, and his associates to include a wider range of elements that affect instruction and learning. Some of the original taxonomy's issues have been addressed in this updated version. It distinguishes between "knowing what," which is the content of thinking, and "knowing how," which is the process of problem-solving, in contrast to the 1956 version. Understanding what is the Knowledge Dimension.

It is divided into four categories: metacognitive, procedural, conceptual, and factual. Word definitions and particular detail knowledge are examples of discrete pieces of information that make up factual knowledge. Conceptual knowledge is made up of informational systems like categories and classifications. The term "procedural knowledge" refers to the understanding of when to apply algorithms, heuristics, or rules of thumb, approaches, and methodologies. The term "metacognitive knowledge" describes understanding how thought processes work as well as how to successfully influence them. There are six abilities in the Cognitive Process Dimension of the updated Bloom's Taxonomy, same like in the original.

They are: recall, understand, apply, analyze, evaluate, and create, according to the hierarchy of complexity. Recognizing and retrieving pertinent information from long-term memory is the process of remembering. The capacity to infer meaning from instructional materials, including reading and instructor explanations, is known as understanding. Interpreting, exemplifying, classifying, summarizing, inferring, comparing, and explaining are some of the subskills involved in this process. The third step, applying, is putting a taught procedure to use in a setting that is either familiar or unfamiliar. The next process is analysis, which consists of breaking knowledge down into its parts and thinking about how the parts relate to its overall structure. Students analyze by differentiating, organizing, and attributing. Evaluation, which is at the top of the original taxonomy, is the fifth of the six processes in the revised version. It includes checking and critiquing. Creating, a process not

included in the earlier taxonomy, is the highest component of the new version. This skill involves putting things together to make something new.
In order to complete creative tasks, students must plan, create, and generate. Every degree of knowledge can be mapped to a level of cognitive process in this taxonomy, allowing students to retain procedural or factual knowledge, comprehend conceptual or metacognitive knowledge, or evaluate metacognitive or factual knowledge..

Anderson and the others assert that "meaningful learning equips students with the cognitive processes and knowledge necessary for effective problem solving." The updated Bloom taxonomy (2001) and the previous one (1956) are contrasted in the accompanying figure.

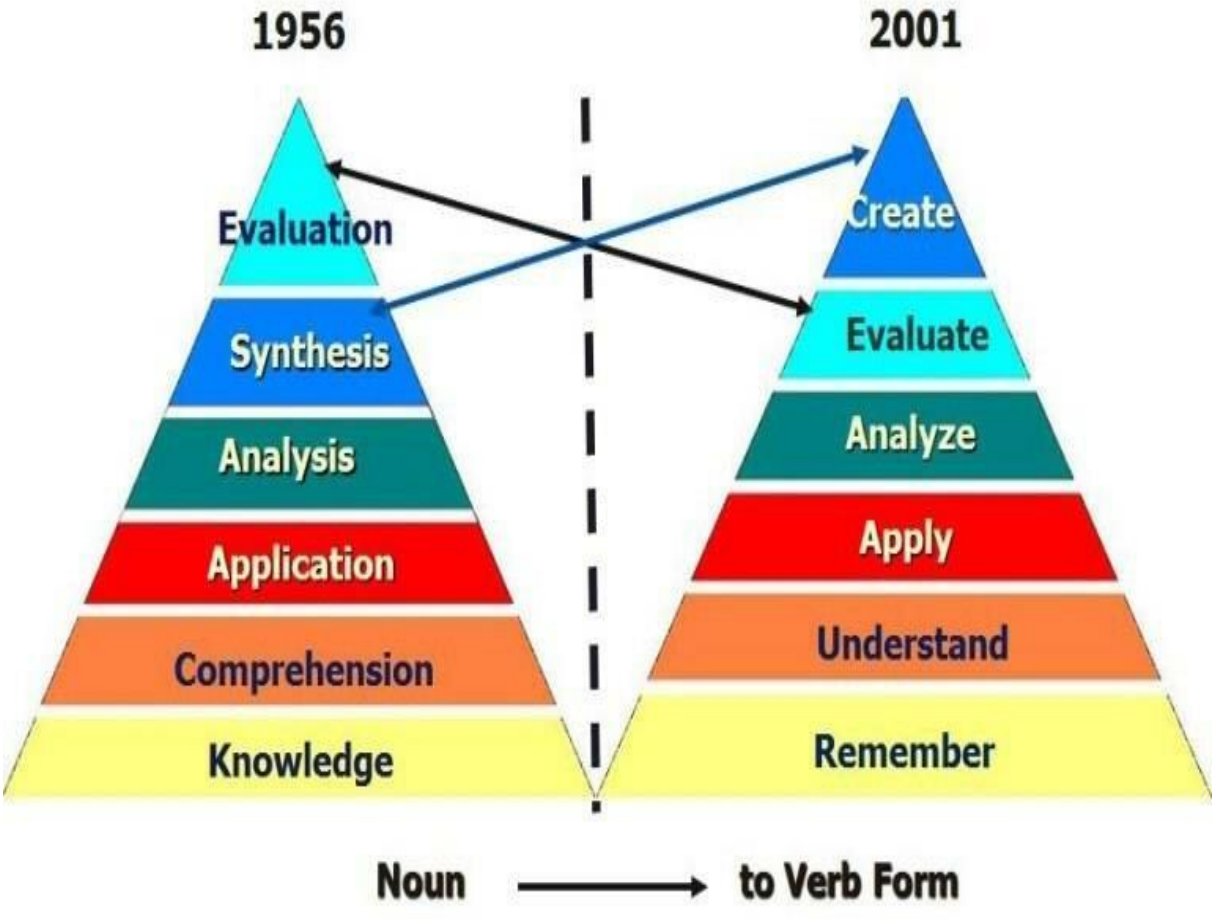

Fig1. Comparison of Bloom's original and revised taxonomies
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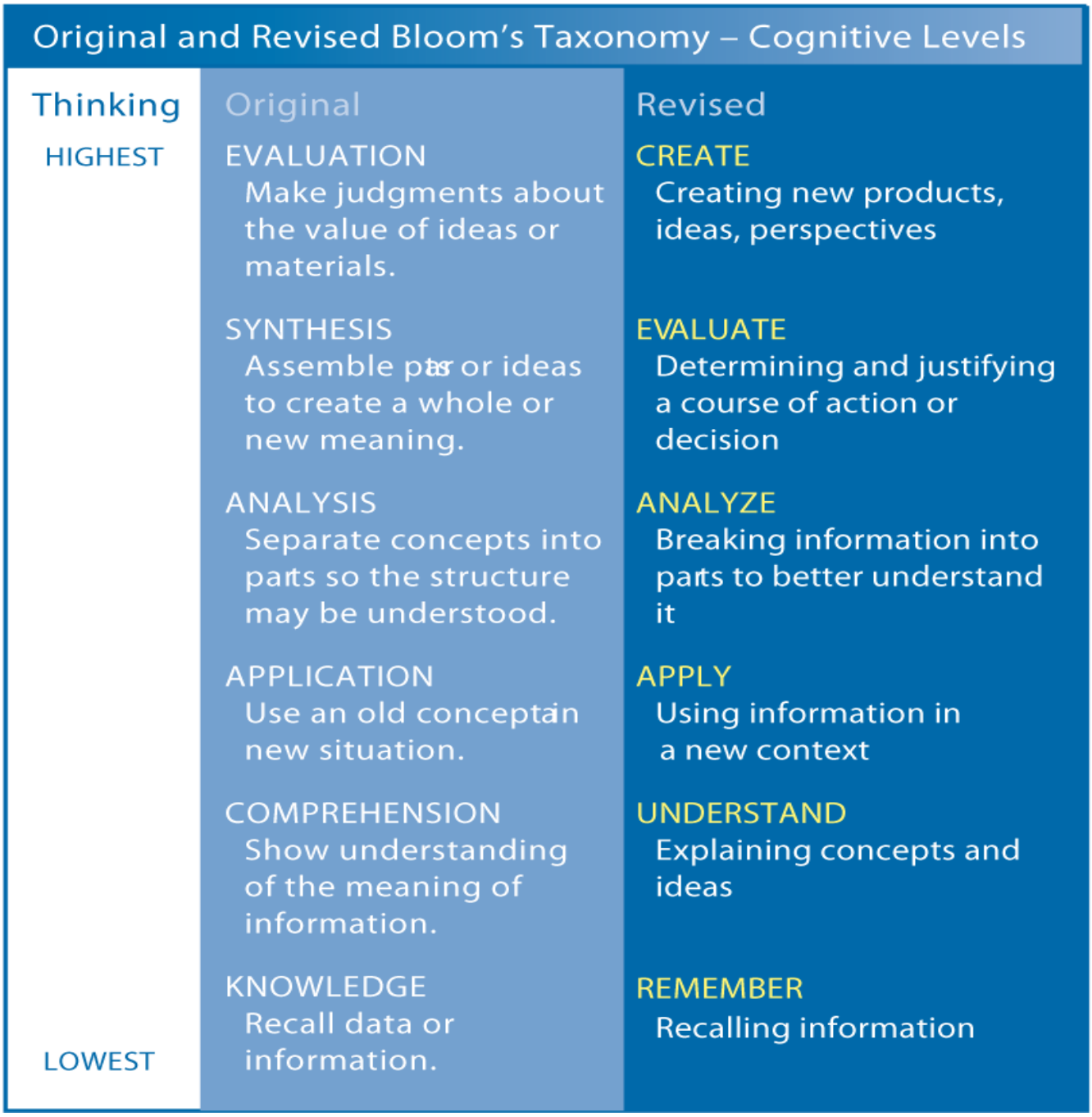

https://images.app.goo.gl/cJ4zcpHgAUTfvmJu92.Criticisms

However, the world of today is not the same as the one that Bloom's Taxonomy represented in 1956. With their increased understanding of how teachers and students learn, educators today understand that teaching and learning are more than just thinking. Along with the social and cultural milieu of the classroom, it also encompasses the attitudes and convictions of both teachers and pupils. The fundamental idea of a taxonomy of thinking skills has been improved in relevance and accuracy by a number of cognitive psychologists. In developing his own taxonomy of educational objectives, Marzano (2000) points out one criticism of Bloom's Taxonomy. The very structure of the Taxonomy, moving from the simplest level of knowledge to the most difficult level of evaluation, is not supported by research. A hierarchical taxonomy implies that each higher skill is composed of the skills beneath it; comprehension requires knowledge; application requires comprehension and knowledge, and so on. This, according to Marzano (2000), is simply not true of the cognitive processes in Bloom's Taxonomy. The originators of the original six thinking processes assumed that complex projects could be labeled as requiring one of the processes more than the others. A task was primarily an "analysis" or an "evaluation" task. This has been proven not to be true which may account for the difficulty that educators have classifying challenging learning activities using the Taxonomy. Anderson (2000) argues that nearly all complex learning activities require the use of several different cognitive skills. Like any theoretical model, Bloom's Taxonomy has its strengths and weaknesses. Its greatest strength.is that it has taken the very important topic of thinking and placed a structure around it that is usable by practitioners. There is no doubt that teachers who

maintain a list of question prompts related to the different levels of Bloom's Taxonomy are more successful in fostering higher-order thinking in their students than those who do not. However, as any educator who has collaborated with a group of educators to categorize a set of questions and learning activities using the Taxonomy can attest, there is little agreement on the meaning of terms that appear self-evident, such as "analysis" or "evaluation." Furthermore, attempting to map them to the Taxonomy would reduce their potential as learning opportunities because so many valuable activities, including real-world problems and projects, cannot be done so. In the parts that follow, this study offers a number of detailed critiques.

2.1. Criticisms on Bloom's Original Taxonomy

2.1.1. Anachronism

Since the publication of Bloom's taxonomy, numerous additional theories and methods have been included into the literature as a result of psychological and educational research. The educational process is impacted by theories and methods like constructivism, metacognitive skills, and self-regulated learning, which also encourage independent learning and the cognitive and perceptual need to take responsibility for the learning process. The need for the taxonomy revision is made evident by these theories and methods (Amer, 2006). Bloom's taxonomy, which represents characteristics of 1956, is not representative of the world today.In this day and time educators have more knowledge about how learning takes place and how teachers lecture (Startalk, 2009). In this case, the shortcoming of the taxonomy and the need for an appropriate structure to become a learner-centered becomes conspicuous.

2.1.2. Agglomeration

The structure of Bloom's taxonomy is additive in nature. It advances in accordance with the level of difficulty and the requirement to activate a previous one for the subsequent stage. The sections are ranked in a hierarchical fashion. The taxonomy uses categories to show its cognitive process. Only in terms of difficulty do they differ from one another. Later on, though, the strict division of categories was loosened, and there was overlap between them (Krathwohl, 2002).

2.1.3. Lack of Constructivist Integration

Constructivism places a strong emphasis on how students generate knowledge while engaged in purposeful learning. Comparing new and old information and applying the appropriate cognitive processes to this information are both important for the construction process. Students might not be able to actively engage in the learning process under this classification. It's possible that students won't be able to choose the facts and come up with their own interpretation. Some students must advance to the highest level in this taxonomy. Every student is expected to advance on an integrated basis these days. Because of this, it is more important than ever to integrate teaching, assessment, and program objectives (Pickard, 2007).

2.1.4. Unilateral Levels

Knowledge level consists of both noun and verb forms in the taxonomy. Whereas target dimension described as noun form is situated in the wide frame bottom steps of knowledge step, verb forms describing cognitional process is defined as students' recognizing and remembering the knowledge. As a consequence of that knowledge step expected to have two dimensional characteristics becomes unilateral. Unilateral structure of the taxonomy fails within the scope of cognitional process. In the knowledge-sized taxonomy students are asked for both knowing the knowledge and remembering it. Although this abnormality has been changed in the revised taxonomy, again this latter one is unidirectional since it takes into account the verb aspect of cognitional process (Krathwohl, 2002).

2.1.5. Atheoretical Levels

Bloom's taxonomy is almost 50 years old. It was developed before we understood the cognitive processes involved in learning and performance. The categories or "levels" of Bloom's taxonomy (knowledge, comprehension, application, analysis, synthesis, and evaluation) are not supported by any research on learning. The only distinction that is supported by research is the distinction between declarative/conceptual knowledge (which enables recall, comprehension, or understanding) and procedural knowledge (which enables application or task performance).

2.1.6. Inconsistent Application

The consistent application of Bloom's taxonomy across multiple designers/developers is impossible. Given any learning objective, it might be classified into either of the two lowest levels (knowledge or comprehension) or into any of the four highest levels (application, analysis, synthesis, or evaluation) by different designers. Equally, there is no consistency in what constitutes instruction or assessment that targets separate levels. A more reliable approach is to separate objectives and practice/assessment items into those that elicit or measure declarative/conceptual knowledge from those that elicit or measure task performance/procedural knowledge.

2.2. Criticisms on Bloom's Revised Taxonomy

2.2.1. Ineffectual Rectifications

Firstly, there are a number of seemingly insignificant but theoretically important changes in the revision. In general, Bloom's Revised Taxonomy has included some noteworthy advances but has not significantly altered Bloom's initial classification. The updated chart just makes the subcategories of every level in the original table broader and easier to understand. Only the most modern methods, including performance-based and genuine evaluation, or qualitative data gathering tools can be used with the Revised taxonomy. It is now thought that the updated taxonomy fills in the gaps left by the original taxonomy and attempts to take into account the body of new information and applications in the field of educational science.
However, with this new arrangement, classification of cognitive domain may not be functional and traceable in practice.

2.2.2. Cumulative Succession

The six stages in this structurally cumulative and hierarchical framework are a succession rather than a true integration seen in real-life circumstances, despite the fact that the Revised Taxonomy gives educators a useful systematic classification for thinking and learning processes. Additionally, teachers must assess students' abilities holistically throughout the teaching and learning process. The level of intellectual behavior must be proposed integratively rather than in the form of a cumulative succession that may be distant from reality in order for this integrative evaluation to be completed. In other words, in the real-life situations, such succession might not exist and these domains of cognitions might not be logical to be called levels since the functionality of these domains are not actually successive, but integrative and usually simultaneous.

2.2.3. Pedagogical Impracticality

There is no real difference in diagnosing and addressing learning and performance gaps based on the differences in Bloom's taxonomy. Since everything above the "knowledge" level is typically regarded as "higher-order thinking" nevertheless, the taxonomy is essentially reduced to two levels. Similarly, the Revised Taxonomy does not offer a technique for evaluating integrated thinking. Additionally, teachers nowadays struggle to choose how to use class time in a way that is both dynamic and integrative. From this vantage point, it is imperative to concurrently integrate educational objectives with regional, national, and local standards. Such consistency of aim, goal, "essential question," and target with each lesson plan in an integrated manner is absent from the Revised Taxonomy. Containing 19 subcategories and two dimensions, the revised taxonomy.constitutes a complex and long structure for teachers. In other words, although it provides teachers with a powerful tool to develop better lesson plans (Forehand, 2005), it is so complicated for them to put it into practice.

2.2.4. Equivocal Weightings

Bloom's taxonomy has been revised to reflect the increasingly outcome-oriented goals of contemporary education. Compared to the assessment level, the synthesis level is one level higher. Levels of synthesis and evaluation are both important, though, and none is better than the others. When it comes to complexity, they are both on par. When either of these is neglected throughout the problem-solving process, the process becomes less effective. Terminological understanding was also disregarded. It is necessary to question content sufficiency in this way. Additionally, it appears troublesome that information is included in the same process as skills and talents, particularly at the lowest level.

2.3. Some Ancillary Criticisms on Bloom's Taxonomy

2.3.1. Discordant Application

Benjamin Bloom (1956) proposed the taxonomy of Educational Objectives, i.e. Cognitive Domain, and the six-level explication of thinking which has been broadly harmonized and applied in innumerable contexts so far. His tabulation of cognitive processes is constituted from the most facile, the recall of knowledge, to the most complicated, making judgments about the value and worth of an idea. With regard to the Revised Bloom Taxonomy, alterations are observed in three main territories. These include: Terminology, Structure, and Emphasis (Forehand, 2005; Krathwohl, & Anderson, 2003). Bloom's Taxonomy is broadly cited in many teacher training programs in reference to how students learn and how to teach. However, it has been maintained that Bloom's Taxonomy is more often than not interpreted incorrectly. Booker (2007) believes that "Bloom's Taxonomy has been used to devalue basic skills education and has promoted "higher order thinking" at its expense" (2007, p.248). In other words, lower order skills such as knowledge and comprehension are being considered as less critical or invaluable skills. Being referred to as lower order skills does not make knowledge or comprehension any less important, rather they are arguably the most important cognitive skills because knowledge of and comprehension of a subject is vital in advancing up the levels of the taxonomy. Therefore, in line with Booker's conclusion, the Taxonomy is being improperly used. Bloom never stated that any of his cognitive levels were less important, just that they followed a hierarchical structure. Booker (2007) points out that even Bloom himself recognized that the application of the taxonomy was unexpectedly happening at the K-12 level and much less so at the university/college level. Ultimately, the criticism lies with

the intention behind the application of Bloom's Taxonomy and not with Bloom himself.

2.3.2. Indefiniteness of the Taxonomies

The original taxonomy has received a lot of praise and is extensively used both in our nation and around the world. It will undoubtedly continue to be utilized for a very long time. However, with the advent of the new millennium, a modification of the taxonomy has become inevitable, just like with everything pertaining to humans. Anderson and Krathworlh (2001) deserve praise and gratitude for their research in this area. However, it must be considered that the updated taxonomy may also not be a trustworthy source because it needs to be made more understandable at higher levels and internalized by educators. Additionally, related samples of different disciplines must be gathered in the literature to allow schools to form this aspect, curriculum developers must be informed to be more careful in the implementation of this revised one.

2.3.3. Misinterpretations of the Contents

Bloom's Taxonomy is often misinterpreted and misapplied by educators. Repeatedly, it is observed that educators interpret the lower levels of thinking to be appropriate for introductory and survey level college courses and that the higher order thinking skills are appropriate for advanced, or junior, senior, and graduate level courses.The impact of that is that early college learners in those courses are limited to only rote knowledge experiences.Of course, that is a problem with the implementation of Bloom's theory and not the theory itself. However, it is still crucial given the impact that Bloom's has on the learning experience, and it leads into a related argument.

2.3.4. Contempt for Proficiency Level

Bloom's Taxonomy – at least in its popular repetitions – fails to acknowledge that learners may perform at varying levels of proficiency within each type of higher order thinking skill. It's not that an early college learner is incapable of application, analysis, synthesis and evaluation; they simply will not perform with an expert level of proficiency in those higher order thinking skills; they should be expected to apply, analyze, synthesize, evaluate, or create, but they will do that at a novice level. For example, a student in a first year micro-biology class can and should be expected to apply knowledge of cell structures and epidemiology to identify a particular organism; however, the level of difficulty of the problem should be appropriate for the first year micro-biology student and not require advanced declarative or procedural knowledge which typically requires advanced study in micro-biology.

2.3.5. Unauthentic Abstract Nature

There are a lot more opportunities for pupils to perform and be evaluated thanks to technology; the variety of simulations and interactions that can be made with it allows for more real-world opportunities to solve problems. Additionally, the growing expectations in the workplace and in academia for students to be more prepared point to the need for additional real-world learning experiences. These factors together suggest that students should be using their knowledge in scenarios that are as similar to "real life" as feasible. This backs up Startalk's (2009) claim that "all objectives are at the use level (i.e., "performance" objectives) and that learners will practice or be evaluated on the specific performance in representative task situations."" We should be observing students performing as they will need to in the future – and measure that performance, at whatever level of expertise is appropriately and reasonably expected of that learner given their prior learning experiences. Simply "knowing" or "comprehending" something is not enough. Perhaps classroom assessment would benefit from focusing on simply engaging learners with active, collaborative and authentic learning experiences and measuring their performance according to the level of expertise the learners should exhibit in that environment.

2.3.6. Oversimplification of Thought

As influential as Bloom's Taxonomy has been on educational practice, it has experienced some severe criticisms (for a review, see Kreitzer & Madaus, 1994). One of the most common criticisms was that the taxonomy oversimplified the nature of thought and its relationship to learning (Furst, 1994). The taxonomy certainly expanded the conception of learning from a simple, unidimensional, behaviorist model to one that was multidimensional and more constructivist in nature. However, it assumed a rather simple construct of difficulty as the characteristic separating one level from another: Superordinate levels involved more difficult cognitive processes than did subordinate levels. The research conducted on Bloom's Taxonomy simply did not support this structure. For example, educators who were trained in the structure of Bloom's Taxonomy were consistently unable to recognize questions at higher levels as more difficult than questions at lower levels of the taxonomy (see Fairbrother, 1975; Poole, 1972; Stanley & Bolton, 1957).

2.3.7. Incompatible Hierarchy

The writers of Bloom's Taxonomy acknowledged some of its shortcomings in an oblique manner. This is demonstrated in their analysis discussion: "It is probably more defensible educationally to consider analysis as a prelude to an evaluation of the material or as an aid to fuller comprehension (a lower class level)" (p. 144). In their discussion of evaluation, the authors also admitted that there were issues with the taxonomy's structure.

They claim that while assessment is ranked last in the cognitive domain because it is thought to require all other behavioral categories to some degree, it is not always the final stage of problem-solving or thought processes. It is quite possible that the evaluation process will in some cases be the prelude to the acquisition of new knowledge, a new attempt at comprehension or application, or a new analysis and synthesis. Therefore, in general, the hierarchical structure of Bloom's Taxonomy simply did not hold together well from logical or empirical perspectives. As Rohwer and Sloane (1994) note, the structure claimed for the hierarchy, then, resembles a hierarchy (p. 47). The following figure summarizes all the critical issues mentioned above.

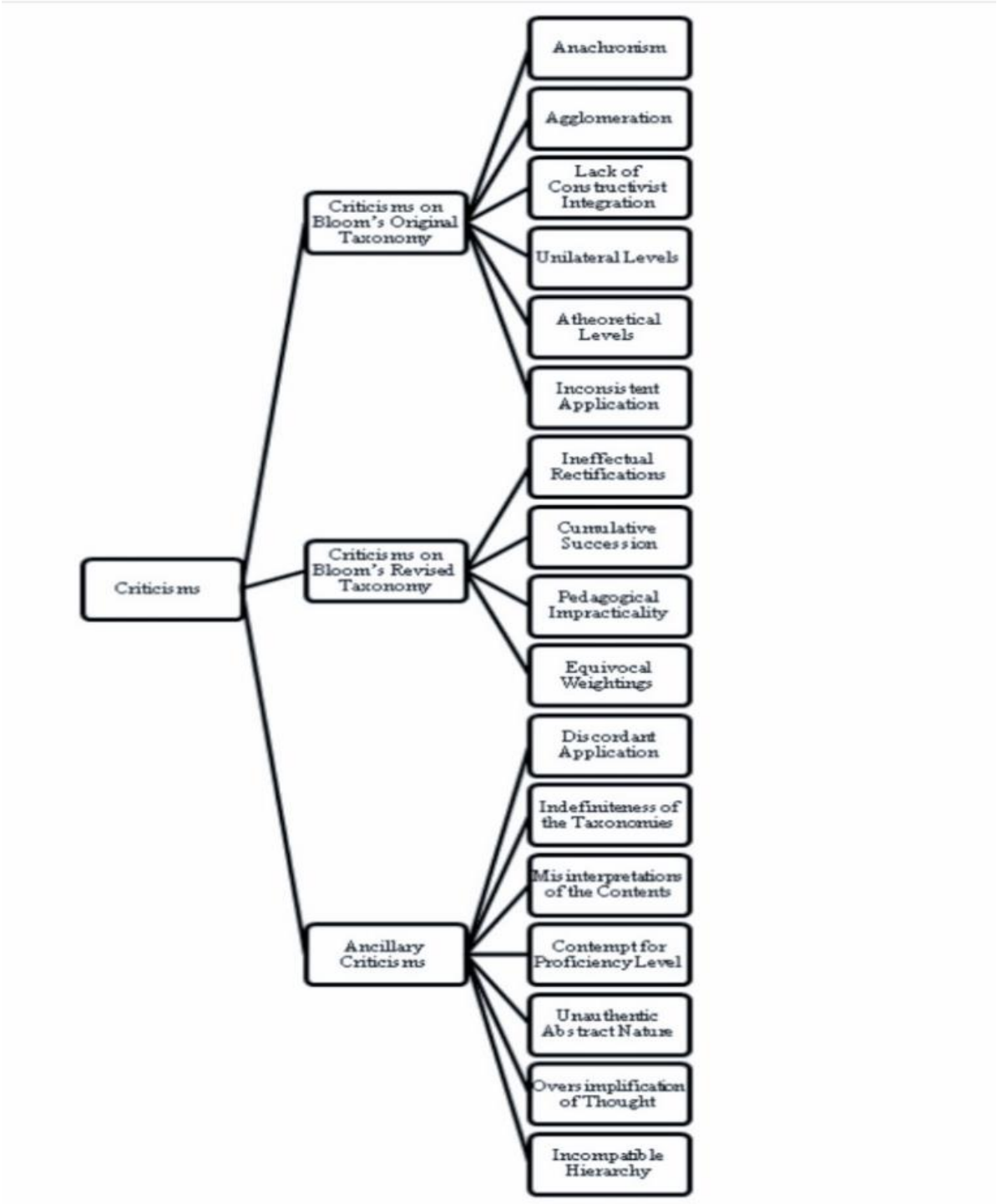

figure 02 summarizes all the critical issues mentioned above.

Conclusion and Implications

The objective of this study was to evaluate Bloom's original and updated taxonomies, which have been in use since 1956 and 2001, respectively. Initially, this study described both the original and updated taxonomies. Secondly, it clarified the main objections to Bloom's first taxonomy. Thirdly, it clarified some objections to the

updated taxonomy. Additionally, the piece concluded with a number of general supplementary complaints.Finally, the study summarizes all of these crucial criticisms in the form of Figure 2. Recent taxonomies of objectives and learning object strategies distinguish among types of content (usually facts, concepts, principles, procedures, and processes) as well as levels of performance (usually remember and use). This content-by-performance approach leads to general prescriptions for informational content and practice/assessment. However, a more radical approach would be to have no taxonomy at all, to simply assume that all objectives are at the use level (that is, "performance" objectives) and that learners will practice or be assessed on the particular performance in representative task situations. If there are "enabling" sub-objectives, those too can be treated as performance objectives without further classification. Before we practice matching buyers to mortgages, we design or provide opportunities for practice classifying mortgages and listing their pros and cons. For instance, if a loan officer needs to be able to distinguish between different types of mortgages and explain the advantages and disadvantages of each type of mortgage as an enabling skill for matching home buyers with mortgages. If describing the features of various car models is a necessary ability for a car salesman to have in order to sell cars, then we create or offer opportunities for practice describing the features of various cars before we practice selling cars.

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