

RESEARCH ARTICLE

BLOOM TAXONOMY VERSUS TOBON TAXONOMY IN DOMINICAN REPUBLIC EDUCATION

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Manuscript Info

Abstract

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Key words:-Educational objective;competency-based learning; evaluation;taxonomy; technical and professional education. This study employs a qualitative methodology, following a dilectical hermeneutic design, the objective is to analize two taxonomies proposed by Benjamin Bloom and Sergio Tobon, these taxonomies are applied inTechnical and professional educationin The Dominican Republic (DR), in the two modalities, the academicand the technical. Bloom'staxonomy is applied in the technical and Tobon's taxonmy in the academic.The question arises: Why are different educational taxonomies implemented in secondary education in theDR? The results we found that Bloom's taxonomy must be observed from its three domains: cognitive, affective, and psychomotor, and not followed in a linear manner.Tobon has unified the three dimensions. It is proposed that research continue to be carried out to allow the taxonomies to be readapted to new times.

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Introduction:-

Recently educational taxonomies were guiding curriculum design, instructional strategies especially in The Dominican Republic, which the current curriculum has three educational approaches, one of them is competencybased learning(Ministerio de Educación de Repúbica Dominicana [MINERD], 2016).Ccompetencybased learning is defined as the capacity to act effectively and autonomously in diverse contexts, mobilizing concepts, procedures and attitudes in an integrated manner (MINERD, 2017).

Two educational taxonomies are compared, those of Benjamín Bloom and Sergio Tobon, in the context of Dominican Republic education, secondary school Poltecnico Máximo Gomez to understand their use in the different modalities and for anyone interested in analyzing, designing, implementing a curriculum, participating in curriculum modification, or applying these taxonomies in the classroom.

Leon (2025) refers to elaborate learning activities the most usedtaxonmy is Bloom thenSocioformative taxonomy from Tobon which develops the social and cognitive aspects of the human being.

This study compares thesimilarities and differences between two educational taxonomies in their structure, purpose and application.

Methodology:-

The methodology used was the qualitative approach of dialectical hermeneutic design in which the conceptionswritten in their textual works of the two authors Benjamin Bloom and Sergio Tobón are analyzed, and interpreted (Schleiermacher, 1834 as cited in Villalobos, 2017).

The knowledge obtained is influenced by biological, pscological factors, and the study we will do, is an individual opinion non susceptible to experimentation which it is possible to have different interpretatations, because of the multiple social realities(Villalobos, 2017).

The procees used was to explain the context, to describe the ideas of both taxonomies, Analize and inter`pretboth taxonomies finding similirites and differences, makinconcluiosns

Results:-

Context

The context is the Dominican Republiccountry, thesecondary level Tehnician and ProfessionalEducation. There are two modalities, academic and technical and two kinds of curriculum. Academic usually uses Tobon's taxonomy and technical Blom's taxonmy.

Ideas By theauthor Benjamin Bloom

- 1. Bloom (1956, as cited in Sánchez-Contreras, 2019), is the first taxonomy designed to assist and direct educational intentions towards the competencies to be achieved.
- 2. It attempts to break down the stages of human skill learning within an informal framework.
- 3. It allows for communication between teachers or examiners, facilitating the exchange of assessment instruments, as well as ideas on how to do so.
- 4. The goals of the learning process are explained from the affective, psychomotor and cognitive dimensions, what the learner must learn (knowledge skills), through six levels of knowledge.
- 5. At the cognitive level, he mentions six levels: knowledge, comprehension, application, analysis, synthesis, and evaluation. Each level is established with the support of verbs.
- 6. The upper levels include the lower ones.
- 7. Bloom (1956), At the lower order levels is the knowledge that allows us to gather information. The skill to be demonstrated is to observe and remember information, know dates, events, places, main ideas, mastery of the subject, indicator words such as define, list, label, name, identify, repeat, tell, describe, collect, examine, tabulate, quote, who when how can be used. At the comprehension level it is to confirm the transfer, interpretation and extrapolation of knowledge. The skill to be demonstrated is to understand the information, grasp the meaning, transfer knowledge to new contexts, interpret compare, order and infer the causes and predict consequences. The indicator words would be different extends, summarizes, interprets, discusses, contrasts, explains, paraphrases illustrate compare predicts associates.
- 8. Application is the ability to apply knowledge, that is, to use information, methods, concepts, and theories in new situations, solving problems using skills and knowledge. Indicator words include modify, relate, change, classify, test, discover, use, expand, solve, construct, calculate, demonstrate, complete, illustrate, or show.
- 9. At higher order levels, analysis is the ability to divide, break down, the skill that must be demonstrated in finding patterns, organizing parts, recognizing hidden meanings, identifying components, differentiating, classifying and relating conjectures, and making hypotheses.
- 10. The indicator words are separates, sorts, explains, connects, divides, compares, selects, explains, infers, arranges, classifies, analyzes, categorizes, compares, and contrasts. The synthesize level allows for gathering and incorporating, using old ideas to create new ones, generalizing from given data by relating knowledge from diverse areas, predicting derived ideas, generating, integrating, and combining ideas into a product, plan, or proposal. The indicator words wouldcombine, integrate, rearrange, substitute, plan, create, design, and invent. What if? prepares, generalizes, composes, develops, formulates, rewrites, and so on.
- 11. Evaluation is the ability to judge an outcome, compare and discriminate between ideas, assess the presentation of theories, choose based on reasoned arguments, verify the value of evidence, and recognize subjectivity. The student evaluates based on specific standards and criteria. Indicator words would be to decide, establish, grade, test, measure, assess, criticize, justify, discriminate, support, convince, conclude, select, establish ranges.
- 12. At the affective level it refers to the emotional response concerning attitudes, values, personal appreciation and motivation for learning. They are categories, reception of the phenomenon, response to the phenomenon, valuation, organization, and characterization. Reception is willing to listen and receive knowledge, in response

to the phenomenon, actively participates and connects with the transfer of knowledge, and at the valuation level finds value in their learning and is motivated to continue, in organization integrates and compares, values, orders according to priorities, and in characterization (internalization of values) It has a system that controls their behavior. Their behavior is predictable consistent, adjusts personally, socially and emotionally (Center for Teaching Excellence. University of Waterloo, sf)

13. Psychomotor domain has the level, imitation, the student learns by watching and copying manipulation, results are guided through memorization or following instructions, precision, results are more expert and more precise articulation, many skills can be linked, naturalization, high level of results achieved with actions becoming second nature (Bloom as cited in Ruhl, 2024)

Ideas By theauthor Sergio Tobón

Tobón (2017, as cited in Sánchez-Contreras, 2019), tells us about the socioformative taxonomy, focused on collaboration, teams and communities.

- 1. Socioformative assessment is feedback and supports the development of talent through problem-solving using collaborative tools, seeking continuous improvement. A characteristic of the term are the levels of mastery, which seek to achieve increasingly higher levels. (Tobón, 2017)
- 2. The socioformative taxonomy tells us about five levels: mastery, preformal, receptive, resolutive, autonomous and strategic.
- 3. In diagnostic processes it is recommended to consider all five levels, while in everyday assessment practice it is sufficient to consider the last four.
- 4. **preformal**domain level has some idea or approach to the problem without conceptual or methodological clarity. Verbs that can be used are, addresses, abides,pays attention, codes, lists, states, explores, reads (without understanding), memorizes, names, observes, reacts, repeats, labels, points out, follows.
- 5. Receptive domain level receives basic information to identify problems basically through notions.
- 6. The verbs that can be used are search, cite, define, name, describe, determine, identify, investigate, organize, recognize, recover, relate, summarize, select, underline, tolerate
- 7. **Resolutive** proficiency level solves simple problems in their key aspects with an understanding of the information and mastery of essential concepts. The verbs that can be used are:applie, characterize, categorize, compare, understand, verify, conceptualize, control, fulfill, diagnose, differentiate, execute, employ, implement, work, motivate, plan, process, resolve, systematize, subdivide, verifies.
- 8. Autonomouslevel argument, solves problems with several variables, has its own criteria and uses reliable sources, seeks effectiveness and efficiency. The verbs that can be used areanalyz, contribute, argue, self-evaluate, self-manage, self-regulate, evaluate, comment, contextualize, criticize, exemplifie, assesse, explain, formulate, hypothesize, infer, integrate, improve, meta-evaluate, monitor, plan goal, reflect, regulate, relate, provides feedback, theorize, value.
- 9. **Strategic** mastery level applies creative and cross-cutting strategies in problem solving, confront uncertainty and change with strategies.
- 10. The verbs that can be used are adapt, advise, help, co-create, compose, create, empower, generate, innovate, interval, judge, lead, personalize, predict, propose, project, reconstruct, synergize, transfer, transforms, transversalize, tutor, link.

Identification of similarities and differences in concepts and principles and in applications.

Tobón (2017) mentions that every assessment process for developing talent must consider certain performance levels to guide improvement and learning processes. This is why Bloom's taxonomy is no longer as relevant; what's needed is one that considers social challenges and transcends content.

One criticism of Bloom is that its conception is too rigid and is based on the industrial age rather than the knowledge age. In the Technical Professional Area, we are currently working with Bloom's mastery levels, however, in the academic area, we work with Tobón.

Bloom's taxonomy mentions six levels of knowledge, from lower-order thinking to higher-order thinking. Tobón mentions five levels of mastery.

Bloom explains the goals of the learning process in the affective, psychomotor, and cognitive dimensions; however, Tobón explains in 5 levels of mastery how to achieve overcoming each level of mastery by solving contextual problems through the articulation of knowledge.

To better apply Bloom's taxonomy, it is necessary to think about the three domains: cognitive level, affective level, and psychomotor level. At the technical-professional level of secondary school in the Dominican Republic, Bloom's taxonomy is applied, although it should be noted that Shabatura (2022) mentions that we do not necessarily start with the lower order, many times at the technical-professional level we learn from doing, meaning that it is not necessarily applied in the hierarchical order, it also depends on the level of the student. At the academic secondary level, Tobón's taxonomy is currently applied because it is considered to contribute to competency-based evaluation. According to the table below, Bloom and Tobón share verbs at different levels, which allows us to reflect that they are very related, just as there are others that are not shared, but could be said to be related.

Tabla1:-Similarities and differences in concepts between Bloom's and Tobon's taxonomies.

	Cognitive Domain Bloom (1956) Nouns	Cognitive Domain Modification Bloom, Anderson Krathwohl (2001) Verbs	Affective Domain Kratwohl, Bloom Masia 1973	Domain psychomotor	Tobón Mastery level
Lower-order levels of thinking	1.Knowledge: Define, list, label ,name, identify, repeat ,count, describe, collect, examine, tabulate, cite, who, when, how.	1.Remember: recognize or recall knowledge from memory	1. Reception recognize ask assist choose describe follow give identify listen name answer choose	1 Imitation Define, Identify, Label, list, name	1. Preformaladdresses, complies with, Comply, attend, codify, enumerate, enunciate, explore, read (without understanding), memorize, name, observe, react, repeat,label, point, follow
Lower-order levels of thinking	2. Understanding: differentiate, extend, summarize, interpret, discuss, contrast, distinguish, explain, paraphrase, illustrate, compare, predict, associate.	2.Understand		2. Manipulation	2. Receptive: look for an appointment defines names describe determines identify investigate manipulates opera organizes reception recognizes recovers recovers records relates reproduce resume concentrates select emphasizes tolerates
Lower-order levels of thinking	3. Application modifies, relates ,changes, classifies, tests, discovers, uses, expands, computes, solves, constructs, calculates, demonstrates, completes, illustrates, shows.	3.Apply	2. Answer: accept , answer , ask assist , clarify , communicate , contribute , cooperate , discuss , help , indicate , ask , participate , question	3 Precision	3. Resolution:applies, characterizes, categorizes, compares, understands, verifies, conceptualizes, conceptualizes, controls, fulfills, diagnoses, differentiates, executes, elaborates, employs, implements, interprets, works, motivates, plans, processes, resolves, systematizes, subdivides, verifies.

Higher-order levels of thinking	4. Analysis separates, orders, explains, connects, divides, compares, selects, explains, infers, arranges, classifies, analyzes, categorizes, compares, contrasts.	4.Analyze	4. organize adapt, arrange, catalog, classify, compare, complete, defend, explain, reestablish, formulate, generate, identify, integrate, modify, order, prepare, range, relate	4. Control	4. autonomous: analyzes, contributes, argues, self-evaluates, self- manages, self- regulates, evaluates, comments, contextualizes, criticizes, exemplifies, evaluates,explains,
Higher-order levels of thinking	5. Synthesis combines, integrates, rearranges, substitutes, plans, creates, designs, invents. What happens if? . prepares, generalizes, composes, develops, formulates, rewrites	5. Evaluate: Make judgments onfunction of criteria and control standards	3. Value : accept approve completely choose commit describe debate demonstrate difference explain reestablish identify initiate justify prepare refute	5.Automation	formulates, hypothesizes, infers, integrates, improves, meta- evaluates, monitors, plans goals, reflects, regulates, relates, provides feedback, theorizes, assesses.
Higher-order levels of thinking	6. Evaluation :decides, establishes, grades, tests, measures, evaluates, criticizes, justifies, discriminates, supports ,convincesconcludesselects establishes ranges.	6.Create: Bring together elements to form a coherent and functional whole by reorganizing.	5. characterize act organize behave characterize defend show exemplify work incorporate influence justify hear keep modify practice preserve carry out propose question review	6 Creativity	5. Strategic; adapts, advises, assists, co- creates, composes, creates, empowers ,generates, innovates, intersects, judges, leads, personalizes, predicts, proposes, projects, reconstructs, recreates, synergizes, transfers, transforms, cross- cuts, mentors, connects.

Note: Own source

Table 2 is an example from a lesson plan in fifthgradeof secondaryin the carrerDevelopment and Management of SoftwareApplicationsSubject:Application Development and Information Systems at the Dominican Republic in the Politehnic Maximo Gomez.

Table 2: Elements	in a Lesson	Plan technical	l modality.	. Identication	of bloom	taxonomy

		l l	
LearningOutcome (Resultado de	Capacity Element (EC)	Levels of Bloom's Taxonomy	
Aprendizaje RA)			
RA2.1 Evaluate and apply programming	EC2.1.1 Describe the main programming	Knowledge	
languages and database engines according	languages, considering the licensing used		
to established parameters to develop	by the organization.		
software applications	EC2.1.2. Describe the elements of the	Knowledge	
	programming language that meet the		
	system requirements.		
	EC2.1.3.Identify database engines based	Comprehension	
	on system requirements, considering the	-	

organization's licensing.	
EC2.1.4.Build a sample application using a programming language.	Psychomotor Application
EC2.1.5.Experiment with the programming language by making syntax changes	Application
EC2.1.6.Value others' opinions while respecting individual differences without disregarding one's own views.	actitudinal

Note. Own source, this module has 4 RA, which we have taken just one.

Table 3 is a planning in fourth grade in a Politecvhnic we barely can identify Tobon's taxonmy in thre cognitive domain cognitive dimension Compares scientific information about theories..."procdural dimension Uses ICT tools, maps, and textbooks for research."andattidnila Shows respect for theoretical perspectives."and metacognitive dimension What does this phrase motivate me to do?"

Table 3

Learning Unit Planning AacademicModalidyScheme Based on Discovery and Inquiry				
Learning Unit: Theories on the Geolo	gical Origin of the American Continent			
Educational CenterPolitécnico Nuestra	a Señora del CarmenGrade4th			
Cross-Cutting Theme				
Sustainable Development: Analysis of t	he factors that have the greatest impact on sustainable dev	velopment.		
L Learning Situation				
Students in the 4th grade at Politécnico	Nuestra Señora del Carmen show interest in learning abo	ut the tsunami that occurred near Matancita.		
Nagua, After watching the movie San A	ndreas Fault, they raise the following questions:			
- How did the American continent emer	ge?			
- What causes earthquakes?				
- What are the main mountain systems?				
They will answer these questions throug	gh the Discovery and Inquiry strategy, using textbooks, ge	cographic maps, and ICT tools. In groups, they		
will present their research findings.				
II. Fundamental Competencie	'S			
Communicative: Compares scientific i	nformation about theories related to natural and social	phenomena using technology to provide clear		
explanations of the data obtained.				
Content Concents	Contant Presedures	Contant Attitudes and Values		
- Continental drift theory	- Explanation and analysis of theories on the	- Interest in using reliable sources		
- Tectonic plate movement and	geological origin of the American continent	- Respect for authorship and proper citation		
direction	- Understanding liberal positivist socialist Marvist	- Use of anti-plagiarism tools		
- Major landforms of the continents	and critical theory nerspectives	- Interest in physical and human geography		
- Volcanic and seismic zones	- Identification of geological faults and tectonic	interest in physical and numan geography		
volcune una seismie zones	trenches on maps			
	1			
Indicators of Achievement				
- Analyzes theories through opinion arti	cles			
- Identifies major geological features us	ing maps and other sources			
- Classifies theories on seismic moveme	ents			
Didactic Sequence Highlights	Discovery and inquiry			
1 Prior Knowledge Activation				
- Observation of reflective images				
- Group discussion and reflection				
- Mapping tectonic plates				
2. Documented Research Process:				
- Watching and analyzing videos on tectonic theories				
- Investigating in books and magazines				
- Group presentations				
2 Ead Descente				
3. Field Research:				
- Observing the school's physical environment				
- Analyzing concerci data				

- 4. Data Organization and Analysis:
- Comparing author perspectives
- Evaluating source reliability
- 5. Theory Verification and Conclusions:
- Group debates
- Drawing conclusions

6. Presentation of Results:

- Group presentations
- Reflection on the value of understanding geological theories

Note. taken from sismaphttps://www.sismap.gob.do/Educacion/uploads/evidencias/202d-05300.pdf

Conclusions and Discussions:-

Comparative analysis of the importance of both authors.

From the author's perspective, these taxonomies can be used as a guide for what should be done to achieve learning, and how to learn it. To consider that both Bloom and Tobón help with learning and its verification through assessment, because it allows for the development of concrete instruments to verify learning and, failing that, provide feedback until the problem of the real context at hand is resolved. During 2024, the Ministry of Education of the Dominican Republic (MINERD) focused on working on projects by applying transversal axes, which allows for the observation of concrete results.

The relevance of this study is when we apply Tobón's and Bloom's taxonomy, both are complementary to each other. Also, whenteachers are developing activities and tools, can use both taxonomy.

Senge (1990) suggests that schools that teach that the fifth discipline is to think of an organization as a system. It is considered that companies are understood as a whole and are capable of learning and renewing themselves, as people do.

The human predisposition to learn is innate; a culture that focuses on learning dedicates its best resources to institutions that contribute to the development of learners. And places must become places where everyone grows and develops intellectually.

The central idea of a learning school is that institutions can be considered organizations that learn sustainably and creatively. Senge goes on to mention that it is possible to change the way people think and act together by creating learning organizations through the five learning disciplines: personal mastery, shared vision, mindsets, team learning, and systematic thinking.

One reflection from summer teacher training, during the year 2024-2025 it was decided to do it by area, the MINERD as a learning entity recognized that it is sometimes necessary to speak the same language, because in previous years the days, although they were grouped by school internally, were not grouped by area, however this time they were organized by area and the leaders of each area modeled their classes to their trainers who are the learning community.

The relationship between Bloom and Tobon can be seen in the application of curricular adaptation in these, based on Tobón's taxonomy and his knowledge assessment strategies, and it is considered that Bloom should continue to be taken in consideration.

Tobón and Lozano-salmoran (2024) consider, Tobon's taxonomy aims citizens integrally to contribute to sustainable social development in an environmental problem situation (through collaboration, complex thinking, ethical life projects, knowledge management and co-creation, and digital technology (including artificial intelligence). Socioformation assumes formation to contribute to achieving sustainable social development.

It was observed that in the summer session in the Educational Districts it is the learning communities, enthusiasm and exchange, reflection and a shared vision word something taken from Senge as one of the five learning disciplines

It can be concluded that both taxonomies complement each other, the updates that have been made are valued, now the last level of Bloom is no longer evaluation but creation, they changed position, it is considered favorable, The author Tobón is being used in the summer sessions and for application in the classrooms, it is worth asking if in these times of technology, will it be necessary to adapt these two taxonomies to be able to evaluate the competence of the students? since they are still used in Professional Technical and now when everyone must use computational

thinking in the classrooms it will be necessary to reformulate these taxonomies, because they must adapt to these new times.

The imposition of evaluation methodology is criticized, consideration should be given to opening options, although at the 2024 consultation table for Plan Decenal Horizonte 2024-2034(MINERD) was proposed to improve the curriculum by working with projects, but it is not the only way to learn and teach, perhaps it is the most convenient because it considers the highest level of Bloom is creation, that is, doing, and it also achieves the highest level of Tobón, the strategic one. It is proposed that research continue to be conducted to realign taxonomies and open ways of learning, ways of teaching, and ways of assessing. Schools must continue to be learning entities, and applying Senge's disciplines strengthens us.

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