Use of Digital Assessments how to Utilize Digital Bloom to Accommodate Online Learning and Assessments?

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Abstract

As there has always been a concern regarding creation of reliable online assessments by educators, this academic article provides an idea for creating of online assignments for the inexperienced assessment literate teachers. This proposed model will show how to utilize Bloom's model to create digital online assignments using ICT tools. The inspiration of this proposed model is taken from a combination of Benjamin Bloom's Taxonomy and Andrew Churches Digital Bloom's Taxonomy, as both focuses on the teaching and learning environment. Due to the pandemic 2020 approximate estimation of 87% of world's student's population (McGee, 2013; UNESCO, 2020) faced the issue of school closure, which gave a rise to online teaching, learning. Therefore, this paper examines the need of creation of reliable assessments which caters to the different students' abilities. By this proposed model and with the Integration of Information and Communication Technology with Benjamin Bloom's Cognitive Domain, this article will add a new dimension towards the online assessment. The main objective of this article is to utilize the common language and the terminology from the Blooms taxonomy for assessing the students depending on their needs and abilities to achieve the targeted learning outcomes.

Keywords: Assessment literacy, Bloom's taxonomy, Digital bloom, Online assessments, Covid, reliability.

Contents

Contribution of this paper to the literature
This study contributes to existing literature by examining the need of creation of reliable assessments which caters to the different students' abilities.

1. Introduction

It would be very rare as a student, even for educators, to be told that they wouldn't have to sit for any of the end of year written examinations. Imagine that. Life would seemingly be so easy, paving way to the next level with flying colors. Just the mere thought of it gives wings to stress, allowing it to fly away. But wait a minute, is this not currently the case for many of the students in 2020?

As a parent, it was quite relieving when the exam board announced about the cancellation of written exams due to the pandemic (UNESCO, 2020) and further declaring that the results would be based on historical data, graded formative and summative assessments, course work etc. However, as an educator and an assessment consultant, the assessments have always been a very reliable tool when assessing the students' progress. This initiated a conversation with a dear friend and an educator, where it was discussed how reliable assessments; have been planned by the educators, especially when considering specific and individual student needs. This thought-provoking realization raised the idea to propose this study for this academic article. Year 2020 has been quite challenging for most of the schools around the world as the educational institutions have now established online teaching platforms due to the pandemic outbreak. Most of the Educational institutes were given a green light for a shut down from UNESCO. As of the 26th March 2020, the closure of educational institutes affected 1.5 billion students which is estimated around 87% of world's student's population. Though schools were encouraged to shut down, teaching, learning and assessing never came to a halt. With that being said, this new normalcy poses the following question; how effectively have the school planned for this short coming regarding the reliable online assessments taking inconsideration the different learning abilities?

2. Purpose of Study

The purpose of this study is to present Bloom's Cognitive Domain to connect with digital bloom's taxonomy, integrated with Information communication technology tools for creating online assessments to cater the needs of the different abilities during these pandemic times through online planning, teaching and learning methods. To prepare the teachers as online assessment literates, the focus of this article will be to present Bloom's taxonomy as a guide in order to connect with the digital aspect in creation of reliable online assessments for the inexperienced teachers. Therefore, this Digital Bloom Assessment Model will act as a guide for the educators. The research is to prepare reliable online assessments to design online activities for the students to suit the needs according to their abilities to reach to HOTS (Higher Order Thinking skills). Therefore, for understanding a concept, remembrance is required and to apply a knowledge; understanding is required (Churches, 2008). As the students are equipped with different learning abilities, Bloom's Taxonomy caters to the needs of the different Thinking Order Skills. So taking in consideration that the learning continuum of Bloom's LOTS, (Lower Order Thinking Skills) to HOTS, (Higher Order Thinking skills) concept categorizes and orders thinking skills as part of the thinking process.

3. Online Planning, Teaching and Learning

The method of teaching and learning starts with a process of planning. Teachers prepare their lessons in advance to facilitate a good, enriched learning environment for the students. While Planning for the online lessons, students can be presented with the introduction of the topic beforehand. Learning Management Systems(LMS) are getting very popular in education environment, where all the teaching and learning resources along with the Lesson plans are shared for that specific school authorized community to access. LMS are web based applications used in the education environment for the purposes of planning, assessing, evaluating, subject content delivery etc (Bombe, 2020). Teachers can place all the teaching Methodologies, techniques and tools in the lesson plan as to how they would implement this plan in online teaching to create a progressive online learning environment. Bloom's Digital Taxonomy by Andrew Churches introduced with the use of Information and Communication Technology to enhance the process of online teaching and learning. During the learning process, the collaboration of 21st century skills, sets an impact on the students and teachers, as it facilitates LOT skills and HOT skills. To understand this further, by using the verbs from original Benjamin Bloom's Taxonomy with the integration of the ICT skills, and recalling specific information students may better recognize, listen, search, google, bookmark etc. through different possible ICT integrated activities such as by the use of the social networking, teachers can create and Facebook group or even WhatsApp group for their subjects where they can exchange their views, suggestions and opinions. In good online teaching and learning environment, teachers as starter activities can introduce the lesson beforehand so that students can recall the concepts before entering the class which can be accessed through cell phones or any device easily accessible to the students (Churches, 2008). Teaching and learning is an ongoing process, as an average classroom of today possesses the combination of different needs. Also, in the present day, the use of the internet and technology has brought a major change, where the learners are enriching their thought process by collaborating their knowledge with their experiences, as part of constructivism (Kalpana, 2014) giving rise to the online classes and the online assessments with the help of Assessment Literate educators.

3.1. Need of Assessment Literate Teachers

Being an assessment literate educator, it is necessary to understand the basic concept in creation of reliable assessments, whether it be for the online assessments or the conventional class room setting assessments (Popham, 2011). The amount of time spent on the teaching practices, requires proper testing which measures the reliability of the assessments to ensure the success of the students and the teachers (Ryan, 2018). The impact of properly designed reliable online assessments by assessment Literate educators, provides further guidance for administering, marking, interpreting assessment results and also using the interpretation for further development (Ryan, 2018). Different methods of the Assessments serve as evidences for the student's progress, whether it be from

International, National, Regional or Local point of view for developed or developing countries. Assessment literate educators are aware that the reliable assessments are an essential part of instruction which enables educators to evaluate, measure, track the progress, understand the students' learning capabilities, acquire new knowledge skills etc. Different types of assessments are used to test the concepts or skills taken up in the class by the students such as Formative assessment, Summative assessments etc. Currently assessment policies are also in place, which forms the basis of student testing as part of the education policy (Best et al., 2013).

4. Purpose and Types of Assessments

Assessment literate educators are aware that the reliable assessments are an essential part of instruction which enables educators to evaluate, measure, track, progress, understand students' learning capabilities, acquire new knowledge skills etc. Different types of assessments are used to test the concepts or skills taken up in the class by the students such as Formative assessment, Summative assessments etc.

4.1. Assessment in Covid-19 Outbreak

Being cognizant and aware to not seem unfair to students, promoting teacher bias, or placing students at a disadvantage, how reliable online assessments are in terms of marking, feedback and students' performance; is taken into consideration when accessing their ability and needs. The need to shift to the online platform, the stakeholders had no choice, so students had to compromise and to go with the set of instructions delivered by the educational institutes (Bender, 2020).

5. Online Assessments

As the technology is revolutionizing, conducting assessments should not be stressful. To conduct online assessments, it has become easier as there is no requirement of using pencil and paper based option (Vipin, 2019). During the pandemic, online assessments have been accepted everywhere. However, to maintain its reliability, (Vipin, 2019) proposes that the online assessment content design should be simple and not be complicated. It should be easy to understand without any flaws; as it will set a reliable measuring tool.

An inexperienced assessment literate educators would not be able to maintain the reliability of online assessments, as they would either need practice or to be presented with a guideline. This may also be connected to the issue of not being able to differentiate the need of the students, not only during the online teaching and learning but also in setting of the online assessments. This also brings us to the relationship of the student teacher collaboration, which would be considered as a weak link; giving rise to students' low self- esteem. And as a result, there may be no improvement in students' performance and progress. With the help of the Bloom;s Taxonomy set as a guidance, students can be challenged as it will provide them with the practice set by the educators; in order to progress from the low order thinking skill to reach to the high order thinking skill.

As part of online assessment for Blooms's Model, Information Communication Technology tools for Memorizing, Recalling and Understanding; flowchart assignments can be provided to the students, for example cooking class, to trace down steps for making a sandwich of your own choice. Or by the use of flash cards recalling the terminologies and their meanings etc. Educators can use readymade application such as CRAM for Flash cards and app.diagrams.net/ for creating Flowcharts.

6. Bloom's Taxonomy

This model was published in 1956 prepared as a set of cognitive domain, to help out students with their different ability needs. The effectiveness of this model will also help in differentiating the curriculum, therefore providing a chance to all the students to progress at the same time along with the high achievers, by participating in the same content area worked on his first Cognitive Domain, dealing with the mental thinking skills.

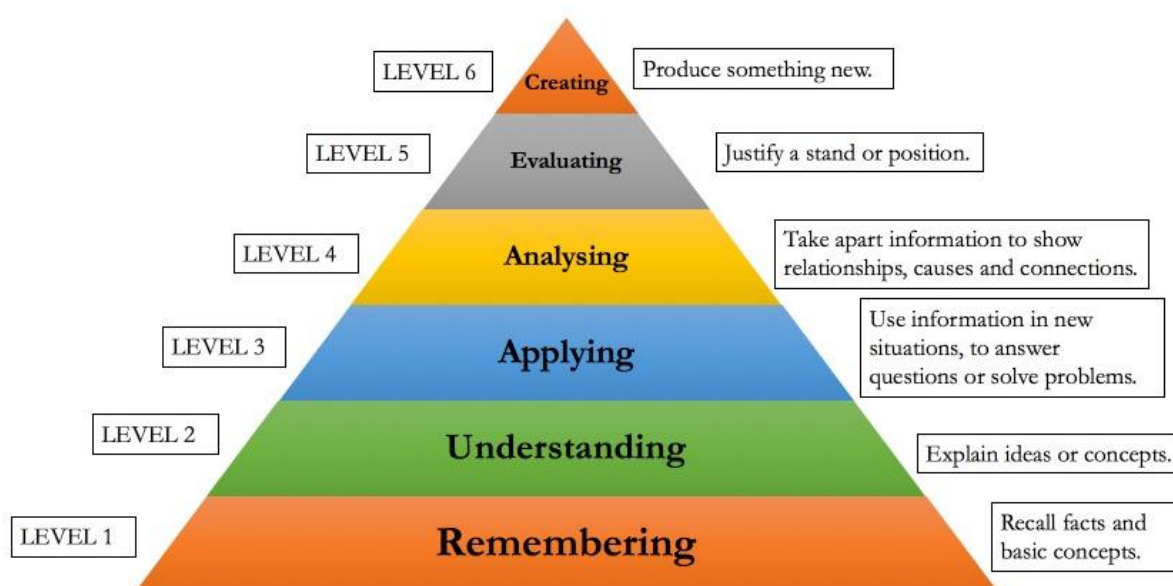**Figure-1.** Blooms' Taxonomy (Cognitive Domain).
Source: Fastiggi (2019).

The students are prepared to progress from simple tasks to higher ability tasks which helps them to enhance their knowledge and understanding for new concepts. Also, the independent learners as the high achievers; apply their knowledge further to synthesize and evaluate to develop new information and express personal values

respectively. This creates a sense of taking the responsibility of their own learning. The structure of Bloom's "Cognitive Domain" needs to be taken in consideration while preparing activities for the online testing as part of conventional assessing strategies. Also, the educators can benefit from this model, as they can prepare their students for better understanding of the usage of the cognitive skill from the very basic to very complicated critical analysis. As this will provide reliable outcome with the help of improved online assessments.

In this digital era and the pandemic times, online classrooms are equipped with variety of digital technologies which has also laid the foundation for the online teaching and learning. And with that being said, the collaboration of the ICT skills and IT tools, these can widely be used in connection with the Bloom's Taxonomy for the creation of reliable online assessments.

The purpose of using this model for all the educators and assessment literate educators is to have a common objective of utilizing the common language and terminology for assessing the students online depending on their needs according to their abilities to ensure that the outcomes of the lesson is achieved (D'Eon, 2018). If the technologies and IT tools are properly integrated with teaching and learning (Fischer & Battro, 2012) this could pave a new progressive dimension towards online assessments.

However, we have seen that in today's digital era, the collaboration of ICT integration has already taken place. A revised form of Bloom's Digital Taxonomy was created as a result of rapid integration of the technologies in 2008 (Churches, 2008). This design will serve as a guide to prepare reliable online assessments and test the students' ability by using the Digital Bloom's Taxonomy integrated with the ICT tools, serving as a model for Assessment literate educators. For a learning experience, to maintain its authenticity by integrating Information Communication Technology, this creates a motivating and challenging environment for the students (Obaiageli, 2019).

7. Digital Bloom's Taxonomy

This model created by Andrew Churches in 2008, is a guide to help the educators to facilitate learning by using Digital tools, associated with each level of Bloom's model (Obaiageli, 2019) especially during the pandemic crises which the world is facing currently.
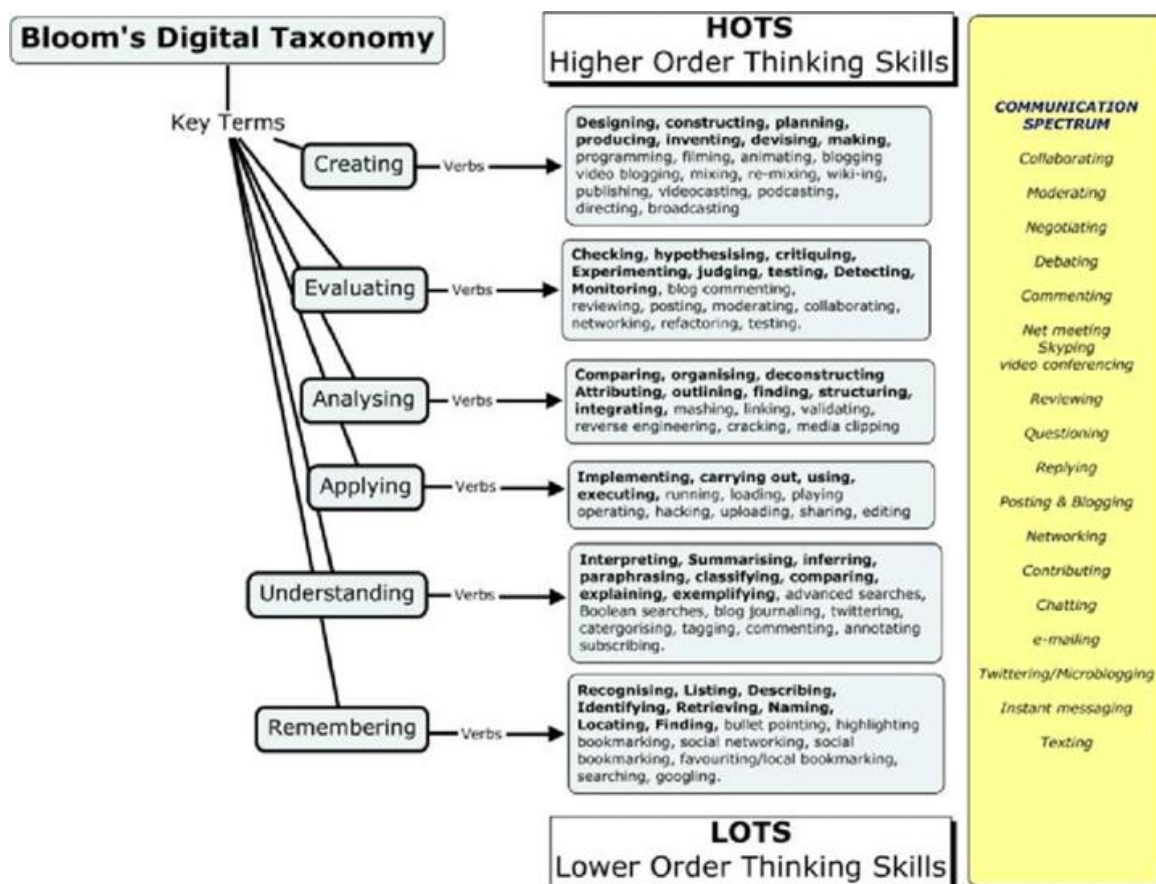

Figure-2. Bloom's Digital Taxonomy (ICT integrated and Thinking Order Skills).
Source: Churches (2008).

Assessment technologies are needed to capture every student's learning step (Esther & Alvin, 2017) and the possibility to create reliable online assessments are by incorporating the Original with that of the Digital bloom taxonomy. This model will provide as a guide for the inexperienced or the assessment literate teachers to prepare the online Assessments, Digital Bloom Model incorporation with ICT tools can be used to devise reliable online Assessment model.

Assessment literate teachers uses the 6 tiers from Bloom's model revised version, "Remembering, "Understanding", "Applying", "Analyzing", Evaluating" and "Creating" and in order to connect the digital Bloom Taxonomy, IC integration tools are utilized for preparation of reliable online activities and assessments. Such as with the use of video conferencing as part of hybrid learning environment, lessons are prepared by using Learning Management System to share the teaching resources with the students which are carefully designed by the educators (Churches, 2008).

8. Online Assessment Using Bloom's Digital Model

Digital Bloom's Model helps the educators to structure reliable online assessment. This is a chance for educators to be creative, by utilizing all the levels of taxonomy and connecting it to the subject content; therefore, teachers can prepare questions for assessments during the online classes (Bender, 2020) with the integration of ICT applications tools, such as You tube, Microsoft office, moodle, wikis, Online tests and quizzes application, by creating varieties of different activities. These can be directly sent to the students, which can be automatically graded along with the feedback. Social Media page can be created for the students to post online assessment reflections and placing their views, feedback such as challenges faced, could have done better, or any positive aspect etc. to further improve or to reflect upon it.

Example for setting up online Assessments with the integration of ICT tools using Digital Bloom's Taxonomy:

8.1. Business

Anna is a professional baker; she is looking for a suitable location for her new business.

Question: What factors should think be considered before decision is finalized.

1. *Level I and II: Remembering and understanding*: YouTube video (For students to see the video and answer the questions provided by the teacher as back channeling).
2. *Level I and II: Remembering and understanding*: Kahoot.it (An app the teacher can use to create quizzes, marked and graded online).
3. *Level I, II and III: Remembering, understanding and Applying*: MS. Office (Ms. Word) For Students to type in the answers for the questions set by the teacher, as offline strategy.
4. *Level I, II and III: Remembering, understanding and Applying*: Ms. Office (Ms. PowerPoint) to create presentation as offline strategy.
5. *Level III, IV, V and VI: Applying, analyzing, Evaluating and creating*: Multimedia creation software (To create own video, as an interview to present interviews as research strategy).

Table-1. Balance sheet 2001 and 2002.

Items	2001 ($)	2000($)
Turn over	20,000	18,000
Cost of sales	12,000	10,000
Gross profit	11,000	8,000
Net profit	4,000	3,200
Current assets	13,000	11,000
Current Liabilities	8,000	7,000
Capital employed	18,000	17,000

Question: Calculate:
  (a) Current Ratio for 2000 and 2001

Question: Differentiate between Current Assets and Current Liabilities.

Options by the teacher for the online assessments using online tools:

1. *Level I and II: Remembering and understanding*: Kahoot.it (An online application that the teachers can use to create quizzes and can be marked and graded online).
2. *Level I, II and III: Remembering, understanding and Applying*: MS. Office (Ms. Excel) for students to solve the questions set by the teacher using spreadsheet, as offline strategy.
3. *Level I, II and III: Remembering, understanding and Applying*: MS. Office (Ms. Word) for students to type in the answers to the questions set by the teacher as offline strategy for further Analysis and Evaluation.

9. Conclusion

Online Teaching and learning could prove very effective if the Digital Bloom's Taxonomy and ICT tools are utilized to design teaching, learning and assessments. Using of Bloom's cognitive Domain to connect with the Digital bloom's taxonomy by integrating Information and Communication Technology Tools for creating online assessment can cater the needs of the different ability students during these pandemic times.

 If the online assessments are designed as per the Bloom's teaching and learning taxonomy, this will help the educators to use the LOT skills to HOT skills in order to teach and assess their students in most reliable way.

Though the online planning, teaching and learning has been in place for some time now, however for effective use, the educators could better incorporate technology to facilitate reliable online assessments. For the inexperienced teachers, creation of reliable online assessments integration with Information communication technology tools, will guide and train them further in the preparation of online assessments. Furthermore, the trained educators can take the initiative as alead trainers in the Assessment Literacy.

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