Teaching and Learning Methodology: Blooms Taxonomy and B-Learning

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Abstract: This paper focuses on the study of combination of two modern teaching-learning methods for improvement of students' knowledge and wisdom level in different educational courses. This study is proposed to calculate the effect of various teaching methodologies in education field. The combined methods are based on Bloom's Taxonomy for Educational Objectives and B-learning. The paper shows study regarding different methods from traditional to modern one. There comparative study shows how improvement in current methods can be achieved. This research work explores available modern methods or resources other than traditional. In this research, impact of combination of Blooms Taxonomy and B-learning is studied and analyze whether it can enhance the student's educational performance. The purpose of this paper is to study a set of core knowledge teaching-learning objectives for modern ethics education. The further aim of this work is to explore the opinion of students about teaching methodologies they found as the most interesting and best.

Keywords: Bloom's Digital Taxonomy, B-learning, Education, Traditional and Modern Methods, Teaching and Learning Methods

I. INTRODUCTION

Swami Vivekananda once said *"A nation is advanced in ratio to education and intelligence spread among the masses"* *[9]*. Education has always been playing an important role in today's world. There had been rapid increase in the higher education system over the decades. Our education system is improving towards teaching and testing knowledge at every step as opposed to teaching skills. Teaching and learning are dynamic towards knowledge sharing at a time of increasingly rapid technological increment.

More innovative and creative ways of sharing and facilitating knowledge development in students are coming up nowadays. Students are bored of the old school approach they are more interested in practical, relevant and useful techniques for their professional life. With computer being their importance, future and living in the era where they are allowed to question on things and they are empowered to be partly responsible for their learning, creativity and innovation have been incorporated in teaching and learning, assessment and supervision. It is critical time both for the students as well as teachers for a change, which can be met if they accept the change and challenge. Teachers are constantly looking for new and effective ways to engage and motivate students in the learning-teaching process. More than ever before, students in further education will apply what they learn in college or university to professional careers that don't yet exist.

Bill Gates Quoted *"Technology is just a tool. In terms of getting the kids to work together and motivating them, the teacher and used methodology is the most important"* *[9]*. To become global leaders and valuable citizens of today and tomorrow, our students must learn to be independent critical thinkers, to be socially and ethically responsible, and to have abroad understanding of the world. Different innovative teaching-learning methods are in use across the globe nowadays. The use of student's ratings for evaluating teaching methodologies is the most researched issue in engineering education. Various researches indicate that students are the most qualified sources to report on various research methodologies. Students will or can identify whether the particular methodology is implementable, informative, effective, satisfying or worthwhile. Student can help in research for evaluating teaching methodology concludes that student feedback tends to be more reliable, valid, relatively unbiased and useful.

OBJECTIVE OF THE STUDY:
To study and do research on innovative methods in Teaching and Learning.

II.   LITERATURE SURVEY

2.1 Learning and Teaching Programming: A reviewand Discussion:

In this paper literature relating to the psychological/educational study of programming is conducted. General trends comparing novice and expert programmers, programming knowledge and strategies, program generation and comprehension, and object oriented versus procedural programming were identified. The main focus of the review is on novice programming and topicsrelating to novice teaching and learning [1]. Various problems experienced by novices areidentified, including issues relating to basic program design; to algorithmic complexity in certain language features, etc. In this literature the majority of studies focuses on program comprehension,often in experts, and typically based on experimental studies.Novicestypically have many deficits in both knowledge and strategies. Familiarity with the specific issues identified in the literature may aid course design. In programming loops, conditions, arrays and recursion are identified as programming languagefeatures that are especially problematic, and could advantage from particularattention.

2.2 A model for teaching an introductory programming course using ADRI.

A research is carried on introductory programming students to get their feedback onthe techniques, topics and associated learning-teaching resources in the technical and non-technical programming course.The instructor's perceptions are included by analyzing current teaching materials andassessment tools used in the course. As a result, an ADRI based approach is proposedto address the problems identified in the teaching and learning processes of anintroductory programming course.The ADRI (Approach, Deployment, Result and Improvement) model is an analyticaltool which is a well-known quality assurance model for self-review and external reviewand is used extensively in the education and business sectors. The first stage of the ADRI model is approach which generally consists of thinkingand planning about tasks [2]. It normally furnishes the development of goals, strategies,objectives, outcomes, plans and targets. Planning should clearly identify qualitative andquantitative goals and should indicate steps to achieve these goals. The second stage is handover stage which provides a media or platform to execute or implement activities. It is important that a clear understanding, including steps to achieve goals, shouldbe in place. Therefore it is evident that proper planning should be ensured at the firststage to achieve targets or goals. The third stage is result, which refers to the output or findings as consequences ofthe first and second stages. Furthermore, it explains the process used to solve theproblem statement to novices. The proposed ADRI approach incorporatesproblems solving strategies in all topics of introductory programming course.Therefore, it supports deep learning of programming concept.The ADRI based approach promotes Problem Statement to Problem solving strategies to Programming knowledge presentation styles in demonstrating programmingexamples and problems. It helps novices in understanding programming concepts indifferent ways.

2.3. Bloom's Taxonomy applied to testing incomputer Science classes:

This paper describes the classification and gives examples and experience from computer science of each Bloom classification. The paper suggests or advices that testing of different levels in Bloom'scategories will test each student mastery of a subject. It also eliminates the bimodal partition of frequency v/s scores that is seen on student testscores. This paper focuses on the perspective area only. This domain can be divided into sixcategories [3]. Those categories are: recall of data, comprehension, application, analysis, synthesis and evaluation.This paper will discuss eachof these categories and give examples of each of these fromcomputer science tests. It will evaluate a test given last fall by the author, according to theBloomcategories. It will then summarize what the author believes to be a better kind of test formeasuring student learning.

2.4. A Method for Creating Assessment Items for Computer Science.

In this paper, Bloom's taxonomy is used to show how to createassessment items in Computer Science courses. For problem solving courses and theory-based courses, the methodshows how assessment items can be designed to stimulatecognitive processing of learners at all levels of Bloom'staxonomy. The method has been used for the past three years inundergraduate Computer Science programmed. Overall, theperformance of students in theory-based and mixture ofproblem-solving and theory-based courses has improved.However, the performance of students in problem-solvingcourses has not improved significantly.This paper will discuss eachof these categories and give examples of each of these fromcomputer science tests[4]. It will evaluate a test given last fall by the author, according to theBloomcategories. It will then summarize what the author believes to be a better kind of test formeasuring student learning.

2.5. Developing Learning Objectives forAccounting Ethics Using Bloom'sTaxonomy:

The purpose of this article or research is to offer a set of core knowledge of teaching-learning objectives for considering ethical education. Using Bloom's taxonomy of educational objectives, learning objectives in six content areas are designed: codes of ethical conduct, corporate governance, theaccounting profession, moral development, classical

ethics theories, and decision models. Defining core knowledge is important for two reasons. First, many accountingeducators continue to debate whether ethics can be taught, apparently unaware that a commonbody of ethics knowledge exists[5]. This knowledge needs to be imparted before higher-levelclassroom discussions can ensue. Second, it is believed agreement on learning objectives isnecessary for the development of meaningful assessment tools. The goal was students should be able todemonstrate ethics knowledge, and accounting educators should be held accountable for whetheror not students are learning.The primary purpose of this article was to offer a set of core-knowledgelearning objectives for accounting ethics education, believing that doing so is importantfor two reasons. First, experience was that many accounting educators, at least those educated in theUSA, have been trained in amoral economics and do not understand that a commonbody of ethics knowledge exists and needs to be learned before higher-level classroomdiscussions can ensure. Second, an agreement on learning objectives can lead to meaningful assessmentusing tools developed and shared across the academic accounting community.

2.6. A Comparative Study of some Traditional and Modern Methods of Teaching LearningProcess.

The teaching and learning methods have changed over a period of time. The traditionalmethods have been replaced by modern methods. The audio visuals are at the main stream that has changed the whole scenario. The different methods of learning, which may either be teacher centered or studentcentered surpass teaching theories. Thepresent study will access the different approaches both in traditional and modern framework [6].Education is the process of enhancing learning, or the acquisition of values, knowledge, skills, beliefs, and habits. The main purpose of the education is not only to make the students efficient but also to make themcreative, knowledgeable, think of their own and to meet the business world.The success of a student depends on theteacher, educational institutes and the innovative methods which they incorporate in teaching. The purpose of this paper is to suggest the innovative teaching and learning methods that can be used in imparting the knowledge to the students. The previous and past teaching methods of learning involve situations where material is delivered to students using a lecture-based format, but a more modern view of learning is constructivism is needed.

2.7. Innovative methods of teaching and learning: Pedagogy

Pedagogy is the advance way to enhance teaching and learning performance in education. Different types of innovative teaching methods are now in use across the globe. Hybrid teaching includes e-learning, m-learning in addition to the face to face teaching. Use of technology and virtual teaching is described in details. Use of smart gadgets for different tasks like teaching, designing question papers, assessment of student, feedback and research methodology is discussed [7]. The application of innovative teaching and learning methods is critical if the task is to motivate and engender a spirit of learning as well as enthusiasm on student's part of view. The role of education is to make sure that while academic lecturers do teach, what is learned and taught should also be intelligible to students from culturally and linguistically diverse backgrounds and that they rapidly become familiar with the expected standards. It is more that students underachieve because of the fact that they have not grasped an awareness of the level of assessment or what it is that the lecturer expects from them.

III. METHODOLOGY

3.1. Conventional methods:

The teaching-learning methodologies under study can be discussed in briefas follows:

Chalk-Board: It is a conventional method of teaching. Itincludes a teacher who is an experienced person and hasmastery on subject; he explains all points and can answer allquestions raised by students. The role of students is toattentively listen to the lecture and takes notes; they can alsoask necessary questions.

Presentations: A presentation involves motivating listeners to accept a new idea, alter an existing opinion, or act on a given premise. In thismethodology students regularly understand the topics in depth before giving any presentation. This methodology motivatesstudents to search a topic from variety of books and otheravailable resources which increases his in depth knowledge. Italso makes a student confident.

Simulations: A simulation is a methodology that encourages students to synthesize and combine information, what they understand and make actual decisions based on data or topics presented inthe study. Simulations give students temporary features or vision and anopportunity to experience outcomes that change based on theirinputs over period of time.

Analogy: Analogy is a powerful tool for discovering, learning; finding and teaching about new areas based on existing knowledge.In this methodologyto make a topic more understandable, the instructor makes use of realisticexamples.

Video Lectures: This methodology which uses the prerecordedvideo lectures of some expert faculties fromrenowned Universities. The instructor can make use of suchvideo lectures in their classes to impart some particulartopics.

Quiz: Quick quizzes are again a good methodology whichhelps teachers to assess the effectiveness of their instruction, aswell as student understanding of the concepts taught.

Role Play: Role play is an interesting activity, which can beused in understanding difficult topics. Particular students are selected in this technique some to in act assome variables making the topic clear. Combining suchlearning activities definitely increases interest in the subject, understanding and knowledge of the course content.It also increasesthe student's involvement in a class room, they are no more actas just passive recipients of the instructor's knowledge butactively participate in the session.

Brain Storming: This methodology includes majorparticipation from staff and also students. In this methodology the instructor proposes a topic for discussion in the class, the students thenprovide their suggestions on the proposed topic and finallyin the end all the suggestions are summed to someconclusion. It encourages student's creative thinking anda simple topic can be learnt through different angles. Figure 3.1 shows classification.
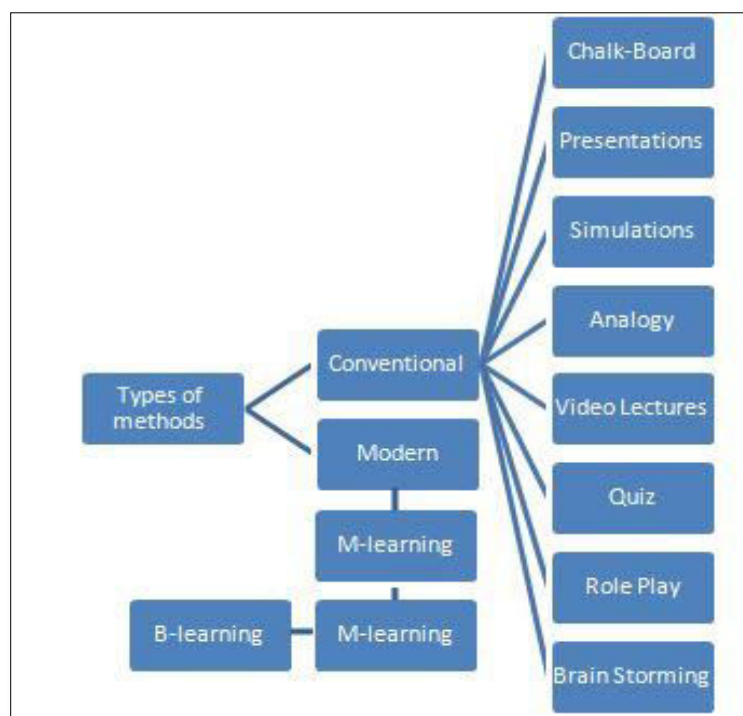

Figure 3.1 Classifications of Methods

3.2. Next Level modern Methods:
3.2.1.M-learning:
Development in technology has resulted in changes in education. M-learning is the superb art of using mobile technologies to develop the learning and teaching experience. According to this, many explanations of m-learning are done. M learning as a kind of learning model is allowing learners to obtain learning materials anywhere and anytime using mobile technologies and the Internet, Web enabled devices such as Notebooks and laptops let students to learn anytime, anywhere they want. Students use this technology to download documents that are matched to their work and they can send messages or e-mail to their teachers. It is a way to keep student in touch for learning and teaching. M-learning technologies remove geographical boundaries and provide a mixed learning environment between non-native groups. Furthermore, advances in handheld devices have facilitated the use of multimedia in mobile applications, which allows mobile learners to have access to a wide variety of richly different learning resources.

3.2.2. E-learning: Before M-learning, E-learning became possible in education and it changed the style of education to be more learner-centered. Education was teacher-centered before E-learning. According to some researchers, E-learning is the delivery of teaching materials via electronic media, such as the Internet, intranets, extranets, satellite broadcast, audio/video tape, interactive TV and CD-ROM. For teaching and learning, E-learning is commonly defined by using technological devices and the Internet.

3.2.3. B-learning: B-learning stands for Blended Learning and it refers to the combination of face-to-face training (with teachers in a classroom) and online education (courses over the Internet or on other digital formats). B-Learning is a hybrid method of learning that mixes these two systems together.

The idea behind this teaching method: To step back from the dichotomy there is between the classroom and the computer. According to those in favor of b-learning, it's not a question of committing to one or other system, rather it's about benefiting from the advantages that both methods of learning offer. The key is in finding the right mix and in not abandoning (due to long-standing inertias or the latest trends) either of these two teaching methods. Figure 3.2 shows intersection of modern and tradition teaching which gives B-learning. B-learning is also referred to as hybrid learning, blended learning, web-enhanced instruction and mixed-mode instruction.
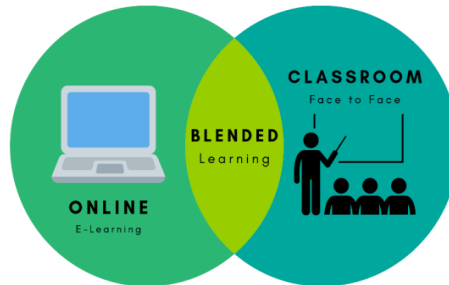

Figure 3.2 B-learning (face-to-face + Online)

Advantages of B-learning:

The key to successful b-learning programmes lies importantly in being able to obtain the best of the two worlds. On the one side, face-to-face training allows teachers to be in direct contact with their students, it establishes interaction with the students in the physical world and it is an important tool by which to transmit knowledge. Its use can help us to organize tasks in a more efficient way, it can encourage teamwork and it facilitates a more personalized attention in accordance with the needs of each pupil. Online training provides students greater flexibility as they can do their course work anywhere and at any time that they are confirmable, it makes it easier for them to send all manner of documents (texts, videos, slides, audio, graphs) and it makes it possible to gather a considerable amount of information as to each student's learning process. The combination of these two teaching methods (if it is done well, of course) has been shown to be more efficient than face-to-face learning and it increases students' motivation and implication.

3.2.4 Blooms Taxonomy:

Bloom's Taxonomy is developed in 1956 by Benjamin Bloom; Bloom's Taxonomy provides a useful framework for instructors to set educational goals in their classrooms. Often illustrated as a pyramid (but in this case, portrayed as a light bulb), the original Bloom's framework scaffolds students' skills. Beginning withknowledge**,** the idea is that a student progresses up the "levels" of the pyramid, tocomprehension, application, analysis, synthesis**,** and finally,evaluation. Figure 3.3 shows Bloom's taxonomy first version levels.
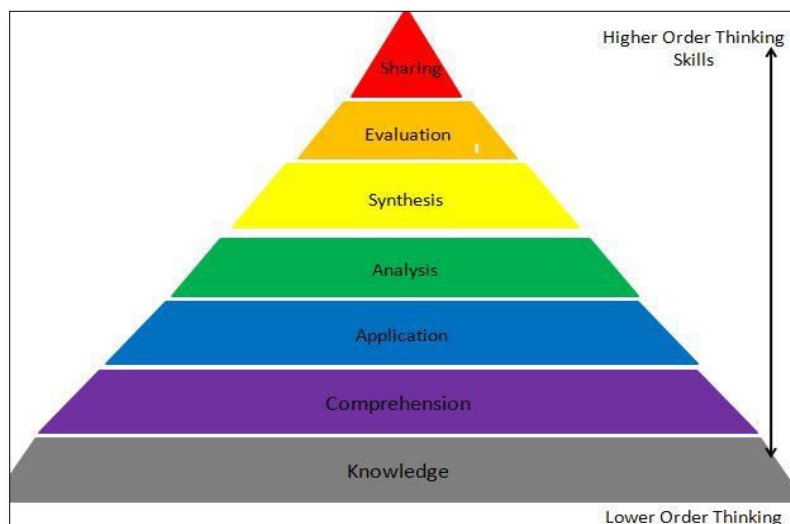
Revised version:

Figure 3.3 Blooms Taxonomy Levels.

Then, in the early 2000's, Bloom's original taxonomy was revised to move away from static notions of educational objectives to action verbs, to better describe student cognitive processes. For example, remembering became remember, comprehension became understanding, and perhaps most importantly, evaluation became creating. And however useful these previous versions of Bloom's Taxonomy continue to be, earlier versions did not fully consider the possibilities created by advancements in technology. See Figure 3.4.shows revised version of Bloom's Taxonomy.

Bloom's New Digital Taxonomy:

Bloom's New Digital Taxonomy, as the new revisions by Andrew Churches came to be known, incorporates technology in a way that is more aligned with the 21st century learner. And it's this new digital revision that may have useful applications to improving courses in administrator preparation programs. Bloom's New Digital Taxonomy includes certain verbs that describe more accurately, how today a student might learn. So for example, to remember (lowest-level cognition), students may highlight, duplicate, or visualize information. To create (highest-level cognition), students may choose to film, direct, or publish an original piece of research. The Figure 3.5 shows levels of Blooms digital taxonomy. Blooms Digital taxonomy is a useful resource from Fractus Learning that illustrates the ways in which students can remember, understand, apply, analyze, evaluate, and create using digital tools.

This revision of Bloom's Taxonomy suggests that it's never too late to revise old systems to make them work for today's learners. While examining whether the current structures of our administrator preparation programs properly equip today's administrators to work and thrive in the modern university or any educational programs. It is observed that future educational administration researchers and leaders are at a disadvantage by not emphasizing technology as a means through which to learn and to create original research. Scholars have noted the absence of emphasis on technology in the field of educational administration & leadership, and Bloom's New Digital Taxonomy may be one way that can address this gap in curriculum.
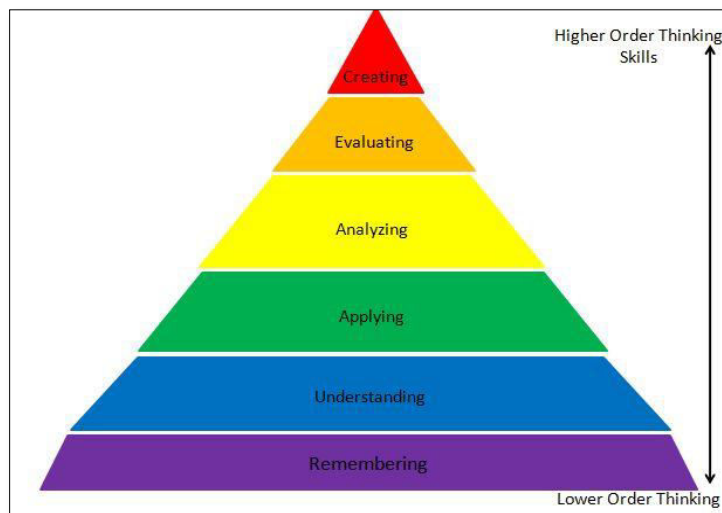

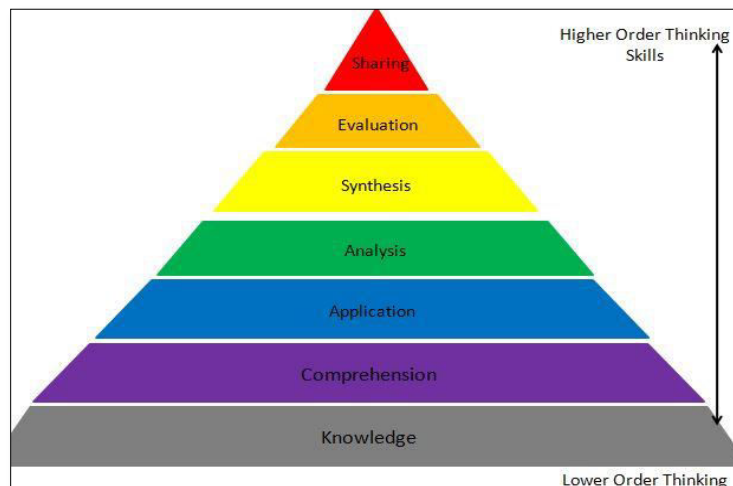Figure 3.4 Blooms Revised Taxonomy Levels.

Figure 3.5 Blooms Digital Taxonomy Levels.

IV.   CONCLUSION

In this research analysis it is identified that if two current teaching learning methodologies are combined there can be more enhancement in students overall performance and achievement. Hence combined Blooms Taxonomy and B-learning was suggested as the best teaching methodology amongst all for an active teaching-learning process. The paper shows study of different methods from traditional to modern one. There comparative study shows how improvement in current methods improved. This research work explores available modern methods or resources other than traditional methods.This research suggests that there is need of changing paradigm from conventional teaching to active learning with the use of various modern teaching methodologies. Digital (B-learning) and Blooms Tactics together can improve students understanding ability and teachers teaching.

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