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The extent of use of Bloom's Taxonomy in the evaluation of selected undergraduate degree programmes at the Sabaragamuwa University of Sri Lanka

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Abstract

Learning in higher education is often associated with Bloom's Taxonomy; levels of active learning are determined, recommended and used by degree programmes in keeping with this hierarchy of verbs. It is our aim to analyse the extent and outcome of the use of this Taxonomy in selected undergraduate studies of the Faculties of Management Studies and Social Sciences and Languages of the Sabaragamuwa University of Sri Lanka. We shall consider as to how far the academics of these given disciplines consciously employ Bloom's Taxonomy in setting questions for end semester formal evaluations, with the hypothesis that this classification is currently being employed by such faculties. Our sample has been derived from the Faculties of Management Studies and Social Sciences and Languages out of a total population of five Faculties at the Sabaragamuwa University. As methodology we have followed random sampling in comparing the verbs of the Bloom's Taxonomy with those of the questions set by the academics for end of semester evaluations in the academic year 2006/2007. Among the findings of the study is the fact that while around twenty five percent of the academics have consciously and effectively employed Bloom's Taxonomy in evaluations, others have used some verbs of the classification (**eg. 'analyse', 'calculate', 'distinguish' 'evaluate', 'illustrate'**) or not used them, with lesser understanding of the alignment necessary between the learning objectives and assessment methods. This study is significant since constructive alignment of teaching/learning /assessment with the learning objectives of an undergraduate course of study is vital in maintaining the quality of each programme, the maintaining of which is the responsibility of all academics. The content of this paper shall enable academics in general to look back on what has been achieved by them with Bloom's Taxonomy as a source of guidance and what the future may hold in relation to it.

Key words: Bloom's Taxonomy, Evaluations, Constructive Alignment

Introduction

Bloom's Taxonomy provides a basis for ideas, which have been used around the world by academics, educators, teachers and trainers, for the preparation

of learning evaluation materials. Collectively these concepts which make up the whole Bloom Taxonomy continue to be useful and very relevant to the planning and design of: school, college and university education, adult and corporate training courses, teaching and lesson plans, and learning materials; these concepts also serve as a template for the evaluation of: training, teaching, learning and development; within every aspect of education and industry Dalton and Smith, (1986). If you are involved in the design, delivery or evaluation of teaching, training, study programmes, learning and lesson plans, you should find Bloom's Taxonomy useful, as a template, framework or simple checklist to ensure you are using the most appropriate type of training or learning in order to develop the capabilities required or wanted. A characteristic of academic creativity is the capacity to evaluate any ideas or products that are created through generative processes. The capacity to evaluate and create evaluative frameworks to judge the value of ideas is therefore an essential feature of academic creativity. Creativity involves the extended abstract outcomes of learning (Biggs, 1999) like hypothesising, reflecting, generating ideas, applying the known to 'far' domains,' working with problems that do not have unique solutions.

Learning in higher education is often associated with Bloom's Taxonomy (Bloom, 1956), levels of active learning are determined, recommended and used by degree programmes in keeping with this hierarchy of verbs. It is our aim to analyse the extent and outcome of the use of this taxonomy in the evaluation of selected undergraduate degree programmes in the Faculties of Management Studies and Social Sciences and Languages at the Sabaragamuwa University of Sri Lanka. We shall consider as to how far the academics of these given disciplines consciously employ Bloom's Taxonomy in setting questions for end of semester formal evaluations, with the hypothesis that this classification is currently being employed by such faculties to some extent. A major concern in this regard is the necessity to ascertain whether academics consciously use this taxonomy in dealing with their assessment activities. Where conscious intent is found lacking in this regard, awareness of the benefits of systematizing evaluations with reference to the taxonomy must be created and promoted.

Bloom's Theory Overview

Bloom's Taxonomy of Learning Domains' or strictly speaking: Bloom's 'Taxonomy of Educational Objectives' was initially published in 1956 by the American academic and educational expert Dr Benjamin S Bloom. 'Bloom's Taxonomy' was originally created in and for an academic context, when Benjamin Bloom chaired a committee of educational psychologists, based in American education, whose aim was to develop a system of categories

of learning behaviour to assist in the design and assessment of educational learning. Most corporate trainers and HR professionals, coaches and teachers, will benefit significantly by simply understanding the basics of Bloom's Taxonomy, as featured below (Table 1). Interestingly, at the outset, Bloom believed that education should focus on 'mastery' of subjects and the promotion of higher forms of thinking, rather than a utilitarian approach to simply transferring facts. Bloom demonstrated decades ago that most teaching tended to be focused on fact-transfer and information recall - the lowest level of training - rather than true meaningful personal development, and this remains a central challenge for educators and trainers in modern times. Bloom's Taxonomy 1956 Cognitive Domain is as follows

Table 1: Bloom's Taxonomy

L	**Category or 'Level'**	**Behavior descriptions**	**verbs which describe the activity to be trained or measured at each level**
1.	**Knowledge**	recall or recognize information	arrange, define, describe, label, list, memorize, recognize, relate, reproduce, select, state
2	**Comprehension**	understand meaning, re-state data in one's own words, interpret, extrapolate, translate	explain, reiterate, reword, critique, classify, summarize, illustrate, translate, review, report, discuss, re-write, estimate, interpret, theorize, paraphrase, reference, example
3	**Application**	use or apply knowledge, put theory into practice, use knowledge in response to real circumstances	use, apply, discover, manage, execute, solve, produce, implement, construct, change, prepare, conduct, perform, react, respond,

L	Category or 'Level'	Behavior descriptions	verbs which describe the activity to be trained or measured at each level
4	**Analysis**	interpret elements, organizational principles, structure, construction, internal relationships; quality, reliability of individual components	analyze, break down, catalogue, compare, quantify, measure, test, examine, experiment, relate, graph, diagram, plot, extrapolate, value, divide
5	**Synthesis (create/build)**	develop new unique structures, systems, models, approaches, ideas; creative thinking, operations	develop, plan, build, create, design, organize, revise, formulate, propose, establish, assemble, integrate, re-arrange, modify
6	**Evaluation**	assess effectiveness of whole concepts, in relation to values, outputs, efficacy, viability; critical thinking, strategic comparison and review; judgment relating to external criteria	review, justify, assess, present a case for, defend, report on, investigate, direct, appraise, argue, project-manage

Methodology

Our sample has been derived from the Faculties of Management Studies and Social Sciences and Languages out of a total of five Faculties at the Sabaragamuwa University. As methodology we have followed random sampling in comparing the verbs of the Bloom's Taxonomy with those of the question set by the academics for end of semester evaluations in the academic year 2006/2007. The sample consists of 102 question papers from the faculty of Management Studies and 96 questions papers from the Faculty of Social Sciences and Languages. In addition, interviews were conducted

with 30 selected academics who were responsible for these evaluations in order to ascertain whether they consciously employed Bloom's hierarchy of verbs in determining the levels of learning in tertiary education and formulated their assessments in accordance with it.

Data analysis

In data analysis we compared the verbs which were used in each and every question paper with the Bloom's verb sets in the sample and output arranged in a Table 2 as follows:

Table 2: Number of papers that used the Bloom's verbs set as percentage range

Faculty	Below 50%	50%-75%	above 75%	Total
Management Studies	**9**	**40**	**53**	**102**
Social Science & Languages	**6**	**27**	**63**	**96**
Total	**15**	**67**	**116**	**198**

Source: Survey Data, (2008)

Table 2 shows the percentage ranges considered as below 50%, 50%-75% and above 75%. These ranges have been calculated as total no. of verbs used in the Bloom's verb sets divided by total no. of verbs used in a selected question paper. For example the subject ECO 221 has used 10 verbs in setting each question, out of them 8 verbs included were from in the Bloom's verb sets. The percentage was calculated range as ((8/10) *100) =80% and categorized in to the range above 75%. This table depicts out of 102 papers in the Faculty of Management Studies 53 papers come under the range of above 75% and 40 papers under the range of 50%-75%. It means that 93 papers out of 102 come under the range of 50%. It shows that the most academics in the faculty of Management studies have used the Bloom's Theory in end semester examination evaluation. On the other hand Table 2 depicts that out of 96 papers in the Faculty of Social Sciences & Languages 63 papers come under the range of above 75% and 27 papers in the range 50%-75%. It further shows that most academics in the Faculty of Social Sciences & Languages have used Bloom's Theory in end semester examination evaluation. Table 1 also shows that there are only 15 papers out of 198 that fall under the range of below 50%.

Table 3 shows the degree of applications of Bloom's theory by the two faculties. It shows that the degree of application come under three categories namely high, moderate and low for academics in the Faculty of Social Sciences & Languages, the degree of application of bloom's theory can be classified as high 52% moderate 39% and low 9%. In fact for academics in the Faculty of Management Studies, the degree of application of Bloom's theory can be classified as high 66% moderate 28% and low 6%. It shows that the academics in both faculties, the overall degree of application of this theory can be illustrated as high 59%, moderate 34% and low 8%.

Table 3: Degree of Application of Bloom's theory in evaluation for end semester examination

Application	Faculty of Social Sciences & Languages %	Faculty of Management Studies %	Overall %
High	52	66	59
Moderate	39	28	34
Low	9	6	8
Total %	100	100	100

Source: Survey data, (2008)

Among the findings of the study is the fact that while a few academics have consciously and effectively employed Bloom's Taxonomy in evaluations, others have used some verbs of the classification (eg. 'analyse' , 'calculate', 'distinguish' 'evaluate', 'illustrate') or not used them, with lesser understanding of the alignment necessary to link the learning objectives and assessment methods. Nearly seventy five percent of the academics that we interviewed admitted that they had no proper awareness of the Bloom's Taxonomy. A dearth of interest is thus witnessed in aligning/ systematizing evaluations in keeping with levels of learning applicable to tertiary education. While most academics have an apt sense of where they are headed in evaluations, they can further make meaningful alterations in assessment activities if Bloom's Taxonomy is put into constant use as a guiding mechanism.

Conclusion

It would be vital to make effective use of Bloom's Taxonomy in future evaluations of undergraduate degree programmes with a view to promoting

further alignment of the teaching/learning and assessment activities. Quality of tertiary level programmes of study and their certification can be maintained satisfactorily if academics look back on their teaching/evaluation strategies followed thus far and create meaningful change in the future in relation to strategies of active learning as applicable to Bloom's classification. Staff development efforts for young academics should necessarily consider these levels of learning since it is vital to make academics aware of their relevance from the formative stages of careers at national universities, thereby making good practice replicable for the future.

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