FINAL EXAM GENERATOR SYSTEM IN COMPLIANCE WITH BLOOM'S TAXONOMY

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Abstract

Final exam generator system compliance with bloom taxonomy is developed for the use of lecturer and admin staff of Faculty of Computer Science and Information Technology, UNISEL. The main research is to develop a system that will evaluate final exam papers which comply with the bloom taxonomy using Natural Language Processing (NLP) technique (Sentence segmentation) in detecting the compliance of bloom taxonomy usage at selected section of question paper. Beside that, a module to make sure the final exam paper meet the standard format will be included in the system. The system will ease the lecturer in preparing their final Exam Papers comply with the standard format.

Keywords: Bloom's taxanomy, final exam

1   INTRODUCTION

Bloom's Taxonomy is a multi-tiered model of classifying thinking according to six cognitive levels of complexity. Throughout the years, the levels have often been represented as a stairway, leading many teachers to encourage their students to "climb to a higher (level of) thought." The lowest three levels are: knowledge, comprehension, and application. The highest three levels are: analysis, synthesis, and evaluation (Data, 2007).

Currently Faculty of Computer Science and Information Technology, Unisel (FCSIT) use manual method in creating final exam question by using any word processor. All the question gathered in conventional way and formatting the question paper done manually. Each question will be referred to the Bloom Taxonomy table manually to ensure the standard meet. By using manually, the lecturers faces some difficulty in standardize the format and most important to match the blooms level. Lecturers have to ensure the bloom level is suitable with the question. Every programme has different level of bloom.

In the evaluation of Final Examination Papers phase, there are few matters need to be considered. Firstly, questions are used to obtain information, stimulate thinking, and redirect reasoning. Secondly, final examination papers are used by academics to assess the retention and application skills of students. Lastly, the various levels of Bloom's taxonomy will be used to form the theoretical basis for distinguishing between higher order question (HOq) and low order question (LOq) in final examination papers. Swart (2010) use a bloom's research forms final part of literature review attempting to distinguish between HOq and LOq in the assessment of student learning.

Below are the system development scope:
1) Focus on Programming courses in FCSIT
2) Section : Objective and Structured Questions
3) Users:
   a) Head of Department
   b) Lecturers
   c) Exam Unit
4) Module:
   a) Generate Question papers
   b) Identify Bloom taxonomy level in question
   c) Bloom's Taxonomy Compliance checking
   d) PDF Format

2   Literature review

2.1 History

History of bloom taxonomy are in 1780, Abigail Adam stated learning, teaching, identifying educational goals, and thinking are all complicated concepts interwoven in an intricate web. Bloom was arduous, diligent, and patient while seeking to demystify these concepts and untangle this web. He made "the improvement of student learning the central focus of his life's work(Forehand, 2012).

Discussions during the 1948 Convention of the American Psychological Association led Bloom to spearhead a group of educators who eventually undertook the ambitious task of classifying educational goals and objectives. Their intent was to develop a

method of classification for thinking behaviors that were believed to be important in the processes of learning. Eventually, this framework became a taxonomy of three domains which is cognitive, affective and psychomotor (Forehand, 2012).

In 1956, eight years after the group first began, work on the cognitive domain was completed and a handbook commonly referred to as "Bloom's Taxonomy" was published. This chapter focuses its attention on the cognitive domain (Forehand, 2012).

While Bloom pushed for the use of the term "taxonomy," others in the group resisted because of the unfamiliarity of the term within educational circles. Eventually Bloom prevailed, forever linking his name and the term. The small volume intended for university examiners "has been transformed into a basic reference for all educators worldwide. Unexpectedly, it has been used by curriculum planners, administrators, researchers, and classroom teachers at all levels of education while it should be noted that other educational taxonomies and hierarchical system have been developed, it is bloom taxonomy which remains ever after nearly fifty year (Forehand, 2012).

2.2 Bloom's Taxanomy overview

Understanding that "taxonomy" and "classification" are synonymous helps dispel uneasiness with the term. Bloom's Taxonomy is a multi-tiered model of classifying thinking according to six cognitive levels of complexity. Throughout the years, the levels have often been depicted as a stairway, leading many teachers to encourage their students to "climb to a higher level of thought.

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2.3 Related Studies

Automated Analysis of Exam Questions According to Bloom's Taxonomy for on computer programming subject domain. A set of 100 questions (70 training set and 30 test set) is used in the research. (Starr, Manaris, & Stalvey, 2008).

Over a period of three years, that this facilitates programmatic and related accreditation activities; it benefits instructors selecting pedagogical tools and assignments; and it enhances communication among faculty engaged in development. We describe Bloom's Taxonomy, illustrate a simple process for applying it in computer science.

Starr et all (2008) stated Bloom's Taxonomy has been used for creating exams and other student assessment instruments. In this paper, it advocate its use for specifying learning outcomes in computer science prior to assessment. Over a period of three years, that this facilitates programmatic assessment and related accreditation activities; it benefits instructors selecting pedagogical tools and assignments; and it enhances communication among faculty engaged in curricular development.

A process developed to apply bloom taxonomy is identify the topic to be covered and consider each level of knowledge in turn and decide which is highest level of mastery that all student should achieve upon completion of the course (Starr et al., 2008).

This paper proposes the use of Bloom's Taxonomy as a vehicle for exploration, specification, and refinement of assessable learning objectives in CS courses. Once Bloom levels have been applied to learning objectives, the instructor's job becomes much easier, in that the problem of designing a lecture to cover a particular topic becomes less nebulous, more clearly specified. This also applies to in-class activities, homework assignments, and test questions.

3   SYSTEM DEVELOPMENT

The current phase for the research in application development. There are two main modules inside the application. It consist of module lecturer and system administrator.

For the lecturer's module, they can generate the paper and the system will be automatically detect a level of in each question. Beside that final exam generator system compliance with bloom taxonomy also can be automatically calculates the percentages of bloom taxonomy in the paper. After that lecturer can generate it into PDF format and save the question in the database. Lecturer also can update the question if they want to change a question. Furthermore, lecturer can retrieve their paper at the search page and download it and check the report of percentages and level bloom at the previous paper.

For the admin module, they can manage the system user. Admin also can search all paper in the database. The system will also provide the searching engine to find the question paper in the system.
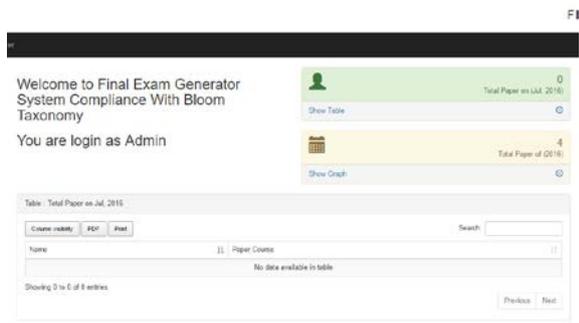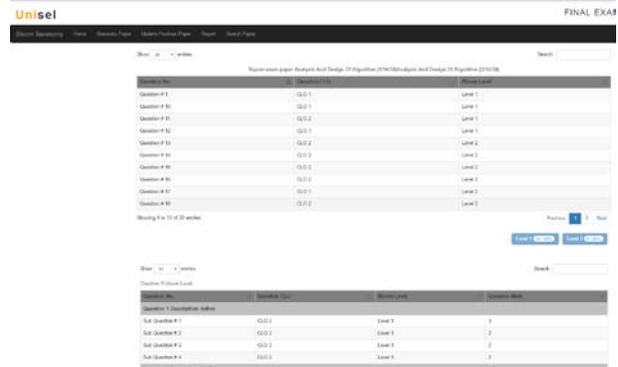
FIGURE 1. Admin page

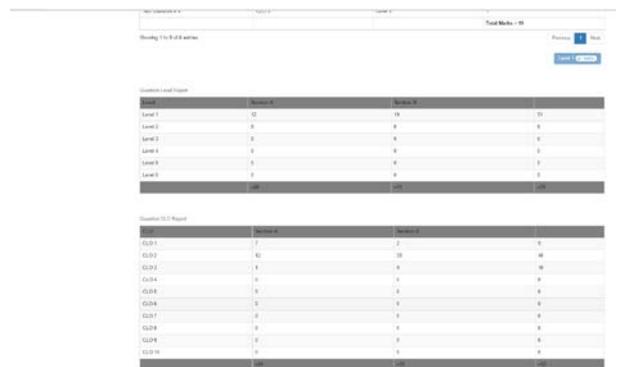

FIGURE 2. Main page

FIGURE 3. Searching page

FIGURE 4. Sample of question paper after generated

FIGURE 5. Question paper generator page

FIGURE 6. Reporting page

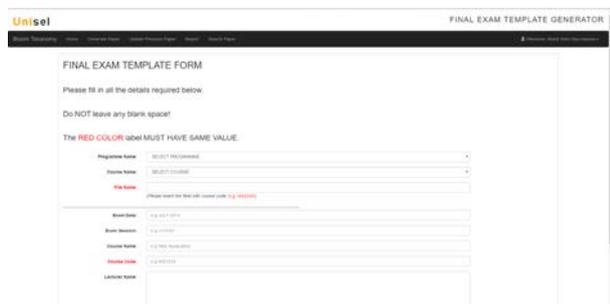FIGURE 7. Reporting page continue

4   CONCLUSIONS AND FUTURE WORK

It is a hope, the system will ease the lecturer's workload and time during compiling their final exam paper. From the system, it will minimize the error on miss use on the blooms taxanomy level. The system can standardize the final exam paper. For future enhancement of final exam generator system compliance with bloom taxonomy are will be updates new functionality for question section c in paper. Another updates section c in paper, the future system will accommodate the image compatibility.

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