



AUTOMATIC EVALUATION OF QUALITY OF EXAMS' QUESTIONS WRITTEN IN ARABIC LANGUAGE BASED ON BLOOM'S TAXONOMY: A SURVEY

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Abstract: Most countries of the world are making great efforts in educational reform processes, and they have established quality departments, which have played a major role in the education reform process in first world countries and also in some developing countries, as it is one of the main pillars of the new management model to keep pace with international and local changes.

The studies in the field of Blooms taxonomy in Arabic Language is very rare. However, there is a number of rich different studies conducted in English language using Bloom taxonomy classification of questions. The written exams questions are the most important tool in use among the evaluation tools that teachers use in universities or schools, and that importance increases when the results of those exams indicate that there is a shortage or lack of production, or that there are shortcomings or weaknesses in the production. Previous studies dealing with research on types of teachers' Questions and mainly the analysis of final exam questions, classroom questions or textbook questions. Also there is a number of studies have applied Bloom's taxonomy to automatic text classification in English language. The materials being classified, features and classifiers used in these studies are summarized below.

Keywords: Cognitive domain, critical thinking levels, Examination, papers, Bloom's Taxonomy, Final Examinations, Bloom's Cognitive Objective.

I. INTRODUCTION

In teaching practice, the effective use to questions depends on teacher's ability to determine Bloom's cognitive level (BCL) of the question he asks. Unfortunately researches on teachers' use of questioning have shown that this skill is typically less effective than it could be. In these researches, it has been shown that teachers at all levels of education tend to ask mostly questions requiring recall and rarely ask questions requiring reflection. This can be attributed to the lack of knowledge about questioning taxonomies. Therefore, in order to improve teachers' questioning ability, it is essential to analyze their questions on the basis of BCLs. The results of such analysis can be used for teacher professional development and evaluating the level of teacher-student interaction.

According to Bloom et al. [1], teachers tend to ask questions in the "knowledge" category 80 to 90 of the time. While these questions are not bad in themselves, using them all the time is not good practice: it is preferable to try to utilize higher order level of questions. These questions require much more "brain power" and more extensive and elaborate answers.

This research will evaluate the exams questions using automatic classification of Arabic language exams questions by using identification from lexical and syntactical feature for each question. Many previous researches are only examined for English Language questions, so as according to one knowledge, there is no similar research in evaluating automatically Arabic Language questions. Thus, the researcher will make the dataset to answer the research

questions. Feature extraction result of the questions will be classified by using rule-based approach applies Natural Language Processing (NLP).

Also there is a number of studies have applied Bloom's taxonomy to automatic text classification in English language.

The Bloom classification was chosen in this study to evaluate the final exam questions prepared by the teacher of computer colleges in Sudanese universities in the courses of computer science and information systems. Because of educators view the teaching and learning process is a comprehensive and complementary manner and they believe in dividing the educational objectives into three areas as it is well known, and that Bloom's classification is more appropriate for evaluation because the Bloom classification can be used in various curricula. The paper is organized as follows:

The first section presents the concepts of the evaluation, the components and process. The second section focuses on quality of examination and the roles of teachers' questioning in Arabic language in the final examination. The third section presents theoretical guides, including Bloom's (1956) cognitive theory and taxonomy of questions and Wu's (1993) taxonomy of questioning techniques that can guide our understanding of teaching and critical thinking. The fourth section presents previous studies related to the research and the final section in this introduces conclusion.

A. Evaluation

The evaluation process is one of the most important basic processes that the curriculum contains in any of the stages of education, and it is the process that the course teacher or educational institution undertakes about the level of success or failure. In achieving the general objectives included in the curriculum, as well as identifying the strengths and weaknesses of the curriculum so that it can achieving the desired goals in the best possible way. This means that the evaluation process is not limited to diagnosing reality, but rather is an effective remedy for its defects, if it is not enough to recognize only strengths and weaknesses, but rather to reinforce strengths and address weaknesses in the curriculum [2].

Evaluation of a curriculum occurs so that the developers can accept, change, or eliminate various parts of a curriculum. The goal of evaluation is to understand whether or not the curriculum is producing the desired results for students and teachers. Evaluation is a qualitative judgement.

B. Classification of Questions according to Bloom's Taxonomy

Question classification systems are systematic observational tools that can be used to monitoring and collection of objective data on aspects of questions such as cognitive level, length, and frequency[3]. This kind of explanation derives from this great interest during the 1950s and 1960s, when researchers needed to study, define, and analyze classroom thinking processes, educational goals, and teaching activities [4]. However, not only did researchers stop studying and describing teacher practices in the classroom, but they also wanted to improve the way teachers implement their practices. As such, many researchers have focused on developing question taxonomies to guide and influence teacher questioning behaviour in the classroom. Thus, several sets of taxonomy have been developed in which teacher questions can or could be categorized by many researchers[5].

Table I. A summary of question categories by selected authors[6]

Authors	Cognitive Levels						
	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	—
Bloom et al. (1956)	Knowledge	Comprehension	Application	Analysis	Synthesis	Evaluation	—
Gallagher and Ascher (1963)	Cognitive memory questions			Convergent thinking questions	Divergent thinking questions	Evaluative thinking question	
Sanders (1966)	Memory	Interpretation Translation	Application	Analysis	Synthesis	Evaluation	—
Blosser (1973)	(i) Managerial questions, (ii) Rhetorical questions, (iii) Closed and (iv) open questions						
Enokson (1973)	(i) Convergent –low level of cognition — Recall of given or remembered data (ii) Convergent –high level of cognition— Integration of processing of given or remembered data						
Wilen (1985)	Low Order Convergent; - questions require students to engage in reproductive thinking. Teacher's intention is to have students recall or recognize information. (ii) High Order convergent; - questions require students to engage in the first levels of thinking. The Teacher's intentions to have students go beyond recall and demonstrate understanding of information						
Zoller et al. (1995)	Lower-order cognitive skills	Lower-order cognitive skills, Part of Higher-order cognitive skills Algorithmic Conceptual		Conceptual Higher-order cognitive skills			
Nurrenbern and Robinson (1998)	Recall	Algorithmic Part of Higher-order		Higher-order			
Anderson et al. (2001)	Remember	Understand	Apply	Analyze	—	Evaluate	Create
Stamovlasis et al. (2004)	Knowledge-Recall	Simple algorithmic Conceptual		Demanding algorithmic Conceptual			
Smith et al. (2010)	Definition	Algorithmic Part of Conceptual category		Conceptual			

C. Classification of questions according to Bloom's thinking level

Chin & Osborne [8] confirms that the difference in questions in terms of the degree to which they arouse students' thinking has led to the interest of a number of educational psychologists, Bloom is one of them, who classified educational goals in the cognitive domain according to graded levels in terms of level of thinking.

The Bloom's Taxonomy of the Cognitive Domain consists of the following levels:

1. **Knowledge:** consist of Knowledge of Specifics, Knowledge of Ways and Means of, Dealing With Specifics and Knowledge of Universals and

Abstractions in a Field

2. **Comprehension:** Translation, Interpretation and Extrapolation
3. **Application**
4. **Analysis:** Analysis of Elements, Analysis of Relationships and Analysis of Organizational Principles
5. **Synthesis:** Production of a Unique Communication, Production of a Plan, or Proposed Set of Operations and Derivation of a Set of Abstract Relations
6. **Evaluation:** Evaluation in Terms of Internal Evidence and Judgments in Terms of External Criteria.

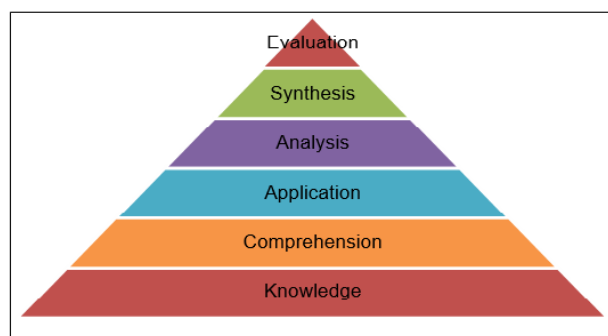


Fig. 2.1 (Source: - Don Clark (2010): Bloom's Taxonomy of learning domains)

- **Knowledge Level**

Knowledge level questions are important to students with their problems for several reasons. From this reason is that, knowledge level questions provide a basis for higher level thinking as memorization of information is required to perform a variety of tasks. The use of knowledge questions also develops participation in the classroom[9].

On the other hand knowledge classification questions have some drawbacks. Most of the teachers overuse knowledge level questions, memorization of facts are stressed which is easily forgotten. Such questions judge students' superficial and shallow understanding of the phenomena[9].

- **Comprehension Level**

The questions asked at the level of comprehension force the learner to know how to explain, describe, summarize or elaborate on previously learned facts[10].

At the comprehension level, students may be asked to explain facts and principles, interpret verbal material, clarify charts and graphs, translate etc. [11].

- **Application Level**

The application level of Bloom's taxonomy is considered as a high cognitive level, which requires a higher level of awareness than the level of comprehension above, and the questions from the application level must ask students to act, manage, apply, express, develop, discover, dramatize, establish, display, use, write, etc. [11].

- **Analysis Level**

An analysis question is one that asks a student to break down something into its component parts and can have ability to distinguish the constituting elements of an idea at large, analysing the relationship between various constituents and splitting up a topic into various interconnected fractions. Making distinctions, comparing, connecting, doing an experiment and solving a problem are the behaviour, which can be judged at this level [1].

The level of analysis is one of the higher levels of Bloom's Taxonomy, and students are asked to break down and organize concepts, ideas, examples, theories, and other information or materials into their component parts to be

better to understand their organizational structure. The questions may include verbs such as analyze, evaluate, divide, calculate, categorize, compare, contrast, relate, diagram, differentiate, outline, etc. [11].

- **Synthesis Level**

Synthesis level of Bloom's taxonomy encourages students to initiate, assimilate, and combine ideas into a product, plan, or proposal that is unique to him or her. They may be engaged in writing an essay, composing a speech, designing an experiment, creating a classification scheme, or generating any kind of project that requires the formulation of new patterns or structures [11].

- **Evaluation Level**

Evaluation level questions require learners to think about a specific situation. Learners need to evaluate an idea, find answers, and make a judgment. An example of the level of evaluation, for example, asking students to evaluate, express opinions, clarify the essence of a particular issue, draw conclusions, and give a clear explanation [1].

Teachers need practice and guidance on asking a variety of questions as only effective questions can engage students actively in learning (Powell, 2004, p. 221).

D. Revised Bloom's Taxonomy

During the 1990s, Lauren Anderson, a former Bloom student, led a new association that came together for updating the Bloom's classification, hoping to add significance to 21st century students and teachers. This time, representatives of three groups: cognitive psychologists, curriculum theorists and educational researchers, and testing and evaluation specialists. Like the original group, they were also hard and persistent in their pursuit of learning, spending six years finishing their work. Published in 2001, the revision includes many changes that seem simple but very significant in fact. The changes occur in three broad categories, which are terminology, structure and emphasis.

E. Learning Outcome

Learning outcomes should be *observable* and *measurable* so that you are able to evaluate whether learners have achieved the outcomes expected (McCourt, 2007). In other words, learning outcomes use **action verbs** to describe what it looks like when learners achieve the learning outcomes. Learning outcomes identify the specific knowledge and skills that one should be able to do at the end of the course. Articulating outcomes – and communicating them clearly and understandably to learners – has benefits to both learners and educators. One of these benefits is to help students attain higher order thinking skills. Using the taxonomy in combination with Backward Design, instructors can design courses that support student learning at multiple levels of cognition.

F. Relationship Between Examination Questions and Bloom's Taxonomy

The written exam is a traditional international tool for assessing a student's performance in a subject area, where the required cognitive ability is determined by elements

such as learning outcomes. Whether the written exam is able to assess a student's ability depends largely on the questions presented on the exam paper. A good and reasonable exam paper should consist of different difficulty levels to accommodate students' different abilities. In this research, the difficulty level of each question on the examination paper is determined from the keyword criteria in the question. Moreover, the research offers comprehensive analysis across student performance, cognitive skills requirements, and unit learning outcomes. The research provides conclusions about the current relationship between exam questions, learning outcomes, and student performance, in addition to providing some indications of the relative changes required to move towards a more appropriate association and thus improve the assessment strategy.

II. LITERATURE REVIEW

A. Sudanese Studies

The researcher was able to find only a few studies conducted on Bloom's Taxonomy in Sudan. Among the researches, only eight studies conducted in Sudan or by Sudanese researchers.

Sati Jomaa, has study about analysing and evaluating of Sudan secondary schools certificate examinations questions in chemistry for the years 2003-2006. The study checking three dimensions: to see if the exam questions cover all levels of knowledge according Bloom's taxonomy, and is it covering the syllabus, and exam questions cover all types of questions. The researcher followed the descriptive method, using the terms of the examinations under study taking the questions of Sudan secondary schools certificate of March 2006 as sample for the study.

The researcher resorted the content using analysis method as a tool for the study depending on the percentage only as statistical method. He found that the exam questions of the Sudanese high secondary school examination focus on the lowest cognitive levels according to the Bloom taxonomy, specifically focused on the level of recall (44), followed by the level of application (36) and then the level of understanding (17). Whereas a small percentage for other levels [13].

Ahmed Gumaa Siddiek has another study, this work is about Evaluation of the Sudan School Certificate English Examinations. This paper examines the content of English language tests in the Sudan certificate on the content of the material and its conformity to good samples and the content of the questions. The data was collected through a questionnaire and analytically processed by machine to come out with some findings that: the English Examinations in their recent forms are incomprehensive and lack content validity. They are proficiency tests rather than scholastic standardized achievement examinations. Therefore, they have negative backwash in language education development in our country [14].

Anwar et. al, is one of studies in the field of Bloom taxonomy. This study compared different machine learning methods (Naïve Bayes, support vector machine, logistic regression, and decision trees) to automatically classifying exam questions based on Bloom's taxonomy. The features

used in the classification were based on linguistically motivated features. The dataset was contains 600 exam questions for English language course. The results of the study show that the machine learning methods together with linguistically motivated features perform satisfactorily in the automatic classification based on cognitive levels of Bloom's taxonomy. [15].

Mohammad Ismail, hi study aimed to measure teaching effectiveness via virtual laboratories according to blooms classification for teaching chemistry in secondary schools level. The researcher used the experimental approach to check the suitability of this study, the study in the state of Khartoum, the subject in the chemistry for the secondary in the third grade.

The study tools were the pre and post achievement test. The sample of the study in its final form consisted of 76 students who were intentionally chosen, 37 students representing the experimental group that was taught by the virtual laboratories, and 39 students representing the control group that was taught in the traditional laboratories. From the result, there are no statistically significant differences between the mean scores of the control and experimental groups in the pre-test achievement of the mean and the standard deviation in the level of recall and understanding. Teaching through virtual laboratories is more feasible and productive than traditional laboratories. The experimental group is better in the levels of remembering, understanding and applying after teaching it by default labs [16].

Ibrahim Mohamed has another study for Sudan English language syllabus "Evaluating reading comprehension question using Bloom taxonomy". This study test to which extent is the exams questions contain the cognitive levels. Twenty teachers participated in this study, and it contained about 215 questions, which were then classified according to Bloom's taxonomy. The results can be summarized as follows: 89.5% of all the questions in the sample belong to the low cognitive level of thinking, and from this percentage; 59.2 of them are at the knowledge level and 30.2% are at the comprehension level, and 10.2% of the exams questions in the sample belong to higher-order thinking skills. 6.1% are related to application level and 4.1% are related to evaluation level. No questions belong to any of the other higher-order thinking skills [17].

Addin and Anwar presented an interesting study on question classification. This work explored the effectiveness of support vector machines (SVMs), in tackling the problem of question classification into Bloom's cognitive levels. A dataset of pre-classified questions has been collected. Each question is processed through removal of punctuations and stop words, tokenization, stemming, term weighting and length normalization. SVMs classifiers, namely linear kernel, have been built and evaluated on approximately 70 and 30 of the dataset respectively, using SVM-Light software package. The obtained preliminary results showed a satisfactory effectiveness of SVMs with respect to classification accuracy and precision. However, due to the small size of the current dataset, the results of the classifiers' recall and F-measure suggest a need for further experiments with larger dataset to obtain conclusive results. In addition, the work did not test the natural language

syntactic and semantic knowledge in questions classifications [18].

Hassan Abu Zaid, performed study to analyse and Evaluate the Achievement of examination of Technical Education Syllabus (Mechanic) in Light of the Good Testing Specifications in the College of Education for the Years (2013-2017), University of Sudan. The aimed of this study is to analyse and evaluating the achievement of final examination of technical education courses (Mechanics) , and to know their achievement of cognitive goals, according to Bloom's classification, and how they confirm to the specifications.

The researcher followed the descriptive approach, and the study community was made up of faculty members and achievement tests for the 2013-2017 with about 64 exam questions.

The study reached the following results: The examination questions focused on lower level of knowledge and neglecting higher levels of knowledge according to Bloom's classification, but the examination in somehow followed a good exam specifications while there is a lack of familiarity with many of the faculty in teaching skills, preparation and schedule specifications [19].

Noor Aldaim his research is to design model to convert manual exam questions to electronics exam questions in Sudanese Universities . The model will enable teachers to enter the types of questions (true and false, Multiple choice) and to determine the knowledge level of cognitive domain of exam questions depending on the types of questions and the cognitive level.

A random sample was collected from four Sudanese universities for 160 students 11 teachers and 10 courses, the data were analyzed and therefore deficiencies were identified in the current practices of the e -exam. A standard model for creating the e -exam was proposed and then an automated tool was developed based on the proposed model. The test of the tool after its application proved its ability to estimate the time of the exam in addition to the efficiency and flexibility in the prepare of the exam questions in an organized manner. The researcher recommends developing this tool and using it in the Sudanese universities to increase the efficiency of the e –exam [20].

B. Regional Studies

A lot of research has been done in the Arab region and other regional centuries which related to the subject of the study that was conducted to one or more aspects of the research. 15 of the researches that have been done in the regional countries have been studied and analysed, but although not all of them directly deal with preparing final exams questions based on cognitive levels of Bloom's classification, a number of studies have applied Bloom's taxonomy to automatic classifications. Also various factors affecting the study or related to the study have been selected and reviewed as follows:

Al-Qahtani, Salem has study titled "Evaluation of Final Exam Questions for Social Studies Questions in Intermediate schools" mentioned in Abha region, it is aimed to know what level these questions are, and to determine the strengths and weaknesses in them. This study was

conducted on the intermediate schools, where the researcher collected the final exams for the first and second semesters, from eleven schools, and the results of the study showed that the exams prepared by the teachers, according to Bloom taxonomy was at the knowledge level, the percentage decrease from comparison until the level of analysis. But the level of synthesis and evaluation, they were not included at all [21].

Barakat and Sabah performed a good study, the aim of the study is to identify if the final exams questions at Al-Quds Open University fulfills Bloom cognitive objectives or not, they collected about (133) paper exam, and the results showed the level of cognitive goals in the final exams, with different topics, was focused on the level of knowledge or recall, the percentage of questions for this levels is (81) of the total questions. In this study, the descriptive approach was used in order to identify the level of objectives prevailing in the final tests set by professors at Al-Quds Open University) [22].

Al Swaidan 2009 , has a good study concerning evaluation and analytical study of the questions mentioned in the book (Natural Geography) In Syria, according to Bloom's classification in the field of knowledge. The researcher carefully read the geography book's questions for the first year of secondary school, then specify the location of each question in relation to Bloom's cognitive levels. He also performed the analysis process, then used two analysts, to ensure the consistency of the analysis among the researcher and analysts.

As a result of the study, questions of understanding got 34.60, which is at Bloom 10. And the remembering questions got 44.28, knowing that they are at Bloom 45. The application level came in at 34.10, noting that it is at Bloom 20. Whereas the ratio of each is at Bloom 10. . But for the evaluation level, it came at 0.1, which is at Bloom 5 [23].

Ayat Jafar Al-Sarayreh has study aimed to identify the types of final examination , prepared by social and citizenship education teachers for 4th and 5th basic classes, in light of Bloom Taxonomy cognitive levels. The population and sample of the study consisted of all exams written at the governmental schools at southern Al-Mazar directorate of education, and the number of the exams was (82) exams which consisted of (1680) questions distributed over three domains. The findings of the study revealed that the general pattern of the final exam questions focus on the cognitive dimension in general and on the level of comprehension in particular and knowledge. Also, the findings revealed that there was a significant statistical relationship between the levels of final exams questions at the cognitive dimension.

In light of the results of the study the researcher recommended that it is important to train social and national education teachers to prepare and write questions for all levels especially high level. And to conduct workshops for new teachers [24].

Fakhir Muhi his research performed an evaluating of English ministerial examinations for the sixth preparatory class according to the cognitive domain.

A checklist based on Bloom's Taxonomy was the instrument used to categorize the cognitive levels of these examinations questions. The sample contained exams questions of the academic years 2013-2014 and 2014-2015. The researchers used proper statistics to rank the cognitive levels of these questions. The results showed that the highest percentage of the questions was in the level of knowledge of (53.33), then followed by comprehension with a percentage of (20) also, synthesis level with percentage of (6.66), whereas the analysis and evaluation levels both got 0 percentage [25].

Salah al-Naqq, has study about Evaluating Chemistry Exam Questions of Secondary school in The Light of Quality Standards from 2007 to 2015 in Ghazza. The objectives of the research the researcher has designed tool to evaluate the questions in the light cognitive levels (remembering, understanding, application, analysis, synthesis, evaluation). To identify the criteria prepared for the questions of chemistry exam, the frequency of each criterion in each of the last nine years was calculated and arranged, and the sum of each of the classifications was monitored.

The results showed that: remembering has the highest percentage, as we found that the evaluation questions has the lowest percentage of test questions in the total of the nine years. In addition, we found that the vast majority of the focus of the examiners was on the questions that need to remembering, this shows a lack of uniformity in the distribution of percentage of the questions [26].

Majdi Jayousi his study aimed to examine to which extent the final exam questions at Palestine Technical University achieve the cognitive objectives at the different levels of Bloom Taxonomy in light of the criteria of a good exam paper. The researcher analysed a group of final exam papers for both compulsory and elective courses in the second academic year, 2015/2016.

The researcher designed a tool to monitor Bloom's cognitive levels according to the hierarchy of knowledge, which includes remembering, understanding, applying, analyzing, installing, and evaluating, then presenting the tool to reviewers.

The findings as follows: The exam papers included 332 main questions, The questions focused on the cognitive domain at lowest level, The cognitive level (recall) came in the first place 73.8, the comprehension level came second 23, analysis and application levels came third (5 questions, 1.6) for each.

In light of these results, the researcher recommended establishing a centre, reporting to the Department of Quality and Assurance, for evaluating exams. The task of this centre is to identify the shortcomings of exam papers and hold training courses and workshops to help the teaching staff boost their skills in formulating the educational objectives [27].

Al-hasanat his study aims at analysing assessment questions included in an Arabic language textbook (Communication Skills) for eight grade in the Jordanian schools according to the levels of knowledge in Bloom's Taxonomy to reveal the percentages of distributing of these questions against this taxonomy. The results of this study revealed that the textbook questions mostly focused on the

lower levels of thinking. Results also showed a graphic disagreement between the percentages of the distribution of the textbook assessment questions and the standard percentages at five levels (Remembering, Understanding and Comprehension, Application, Analysis and Evaluation) [28].

Safa' A. Al-Smadi et al, has another study this work is analysing of Secondary Examinations Public Questions for the Study of Public Culture in Jordan According to the Levels of the Cognitive Domain According to Classification of Bloom. The study aimed to identify the levels of the cognitive domain according to classification of "bloom" for the public culture in Jordan for (2011-2014), the study population and its sample consisted of all secondary examinations public questions for the study of public culture for (2011-2014) in Jordan. The study sample was chosen purposely, the researchers used adscription analytical method to conduct the study, and the study represented a tool in the analysis of the targets cognitive levels according to the classification of (bloom).

As a result (67.8) of the total questions in the level of remembering, while the comprehension questions is (14.9) and the application level questions is (1.5), the level of analysis questions it reached 15.8, which is a balanced and medium ratio, while there were no questions for both the composition and the evaluation level. [29].

Tahseen Al shahir et al, have study about evaluating of final exam questions for Arabic grammar in the College of Islamic Sciences in light of Bloom's cognitive levels In Iraq.

Its aims to evaluate the final exam questions of Arabic grammar in the College of Islamic Sciences In view of Bloom's levels of cognitive field, and to see how the test questions are covered all fields of learnings. The two researchers found that the level of understanding got the highest iterations at (43) and the level of knowledge obtained 26, While the application level obtained the level of analysis 7. As for the level of composition, it obtained 6 While the level of the evaluation obtained 1.

As a result of research, the researchers recommended that attention should be paid to the principle of balance in developing exam questions, between lower and higher cognitive levels, and the need to focus in final exam questions on questions that stimulate thinking, criticism and deduction, and levels of originality, creativity, and evaluation [30].

Ibtisam Salem Al-Mazoughi, his study is about Evaluation of Final Examinations Questions according to Bloom's Classification of Cognitive Aims. The aim of the research is to verify that the final exam questions cover knowledge goals with different levels according to Bloom's classification. The researcher analysed 509 questions taken from 26 final examinations in the department of psychology. The analysis was based on these levels. An analysis card was used that includes Bloom's classification levels: remembering, understanding, applying, analysing, synthesizing and evaluating; where the final exam questions were classified in the form of repetitions and percentages. The results revealed that 'remembering' ranked (85), understanding (13.9) whereas the application level ranked third (0.6), the other levels got zero percentage [31].

Salwa Ahmed Amin, Evaluating of the final exam questions for the departments of the Education College at Salahuddin University Iraq, according to Bloom's classification. In both the survey and the data analysis, the researcher used the descriptive approach. The data of the study were the questions of the theoretical final exams in the College of Education in the years (2016-2017).

The researcher designed a special form, to be used to analyze the exam questions, which consisted of all levels of the knowledge domain according to Bloom's classification, and the results were as follows: The knowledge, comprehension and application level got high percentage, small percentage of the final exam questions focused on high level ; analysis, synthesis and evaluation [32].

Abdulaziz Ibrahim his study aimed to investigate the thinking levels of questions asked by EFL instructors for first year English Department students at Al-Imam Mohammad ibn Saud Islamic University. The study also aimed to analyze the cognitive levels of the comprehension questions demonstrated by the reading and writing textbook taught for first year English Department students at IMSIU. In addition, the study examined the extent to which the instructors' questions and the book they taught differ in the proportions of lower- and higher- thinking level questions.

The sample of the study consisted of 15 reading and writing classes taught by EFL instructors. Furthermore, all of the questions in the textbook were classified according to the Revised Bloom's taxonomy. Descriptive and inferential analysis was used to analyze the data. The findings showed that the majority of the first year teachers' questions are lower-cognitive levels (knowledge, comprehension and application). Furthermore, the results of the textbook analysis also showed that there was a tendency towards lower-level cognitive skills in the two textbooks under the study [33].

Yasser Salim Rajeh his research is about analysis of the Exam questions of chemistry in the secondary school certificate in the Republic of Yemen in the light of Bloom's classification. This study aimed to identifying the levels of knowledge of Bloom classification (memory, understanding, application, analysis, composition, evaluation) for the years 2014-2017.

The sample of the study consisted of the exam questions of the general secondary certificate of chemistry for the years 201-2017 (118). The researcher used the frequencies and percentages.

The result of the analysis of exam questions were concentrated on memorizing level at a rate of (60) followed by the questions of understanding level (23), followed by application level (14). Whereas a very low percentage of questions at the higher levels, analysis level at rate of 3. The creation and evaluation questions with 0 and 0 [34].

Jamal Khalil Al-Khaled his study titled: Analysis of the Evaluation Questions in Religious Sciences' Textbooks in Saudi Arabia and Kuwait in light of Bloom's Revised Taxonomy of Learning Outcomes.

This study aimed to reveal to what extent the evaluation questions in the ninth grade religious sciences' textbooks in

Saudi Arabia and Kuwait reflect Bloom's revised taxonomy of learning outcomes during the academic year (2019-2020).

The researcher used descriptive and analytical approach of the evaluation questions in the targeted textbooks by preparing an analysis form that assured their psychometric properties. The results of the study showed that the evaluation questions in the targeted books focused on the lower levels of thinking (comprehension and memory), whereas the higher levels on Bloom's cognitive hierarchy :(evaluation and creativity) were ignored. The results, further, revealed a statistically significant difference regarding Bloom's hierarchy inclusion in the evaluation questions of religious sciences' textbooks that can be attributed to the variable ' state/government ' in favor of the questions of Saudi religious sciences' textbooks compared to the Kuwaiti books [35].

C. International Studies

Various studies have been done abroad concerning the topic undertaken for research on one or more aspect of the investigation. **34** of the researches that have been done internationally have been studied and analysed. Not all of them directly deal with final exams questions based on cognitive levels of Bloom's classification. The following studies were reviewed:

Qaisar Sultana his study is to evaluated the lesson plans submitted by 67 teacher interns in Kentucky to determine the extent to which their lesson objectives were designed to develop high order thinking skill in their students. The researcher and a colleague individually and independently categorized the data into cognitive levels using Blooms' taxonomy. After analysing the data they found that percentage of 77 of the lesson objectives were aimed at the three lowest cognitive processes, i.e. knowledge, comprehension and application. 41 of the lesson objectives were of knowledge, 91 of the objectives were at the comprehension level, the second lowest level of the taxonomy. The third lowest level of the hierarchy, application, was 16.7. Only 3.2 were considered to be of evaluation level. The next level of the taxonomy, analysis, was at 10.3. The remaining 9.5 of the objectives were at the synthesis level, which is the second highest level of the hierarchy.

The result from this study indicated that the first year teachers in this school district were aiming their teaching primarily at the lowest cognitive levels. The importance of developing higher-level thinking skills is discussed. This study points out that if we want new teachers to be able to teach higher order thinking skills we need to develop these skills in teacher education candidates [36].

Salih Cepni , he analysed exam questions prepared by university lecturers who worked at different science departments according to the cognitive levels of Bloom's Taxonomy. In the study, 787 exam questions from the physics, chemistry, biology, and mathematics departments were collected and analysed by using the document analysis method. A scale prepared by the researcher based on the Bloom's Taxonomy was used. Results showed that 81 of the questions were at the first three levels and 19 of the questions were at the last three levels in the taxonomy. This means that examination questions used to assess university

students' achievement levels are at low cognitive levels [37].

Zheng et, el the general goal of their study was to explore how researchers might use Bloom's taxonomy to quantify and compare levels of assessment from different exams, they discussed that the cognitive level of multiple-choice questions changes according to the structure of the questions, and what is required of these questions. The method of constructing questions can be done at the level of application, analysis, installation and evaluation, and away from the method of memorization and recall [38].

Colin & Ursula they performed a research to answer the question " Is Bloom's Taxonomy Appropriate for Computer Science?". Five academics rated the various assessments on the course and decided which Bloom level the material was at specific levels.

As a result they found that there is a considerable disagreement between the academics responsible for the design and delivery of these modules (conveners) and the group who analysed all the assessment tasks (assessors) about the level at which assessment was being carried out. The assessors felt that the vast bulk of assessment was at the application level, while conveners considered that they were also assessing analysis. One reason for this could be the difficulty of determining the taxonomic level of the assessment without having an intimate knowledge of the way in which the material being assessed was taught. (This difficulty was identified by Bloom et al themselves) [39].

Errol Thompson et, el in their research they found that Bloom taxonomy is a valuable tool that could enable analysis and discussion of programming assessment if it could be interpreted consistently. They discussed each of the Bloom classification categories and provide a consistent interpretation with concrete exemplars that will allow computer science educators to utilise Bloom's Taxonomy for programming assessment. They concluded that using Bloom's Taxonomy will help to design examinations with great improve quality of the assessment in introductory programming courses. (5- Australia) [40].

Thompson, et el. they used Bloom's Taxonomy to help design examinations to improve the quality of assessment in computer science courses. For this study, exam scripts from first-year programming courses were supplied by 6 institutions from Australasia and the USA. Each exam script was independently analyzed by the 5 authors, and its questions classified according to the categories in Bloom's Taxonomy. During the analysis, it was found that questions could be reworded in such a way that the cognitive level is altered. Using the Bloom's Taxonomy forced them to review the exam questions in terms of how the paper/subject was taught. Simply reading the questions did not always give a clear indication of the cognitive skill involved in addressing the question. It was felt that a common understanding of the interpretation of Bloom's taxonomy for the programming domain would be useful for teaching faculty to develop exam questions, particularly in courses with multiple staff members [41].

Wen-Chih and Ming-Shun have another study, this work is analyzing some English question using the Cognitive level of Bloom Taxonomy. Fourteen test item resources are

tested in the system. Each test item has unique item number and is classified into Bloom's cognition level by researchers. They compare the result of Bloom's cognition level from researchers and the proposed analysis system. It give some good result but not high percentage [42].

Karl O. Jones et al. they tried to distinguish between three different types of questions, namely Low Order Cognitive Questions, Intermediate Order Cognitive Questions and Higher Order Cognitive Questions in light of Bloom's Taxonomy. The aim is to ascertain whether engineering academics are assessing critical thinking and problem-solving skills by using effective questions. The examination papers presented in one academic year to second and final-year students on eight programmes were assessed and categorized into low, intermediate, or high-ranked questions using the verb list provided by Dalton and Smith. These programmes constitute Bachelor of Engineering (BEng) degrees and Bachelor of Science (BSc) degrees in a range of engineering and technology subjects in the general field of electronics, and encompass some 29 examination papers. The study provided the results of 0, 67 and 33 for LOCQ, IOCQ and HOCQ respectively [43].

Khorsand, Narjess examined the cognitive levels of questions used by Iranian EFL teachers in advanced reading comprehension tests. Twenty teachers participated in this study and generated 215 questions, which were then categorized according to Bloom's taxonomy. The results of this study showed that the most dominant question type was 'knowledge' (54.21) followed by 'comprehension' questions (38.74). This indicated that 92.43 of questions aimed at the first two levels of the taxonomy. Next to these two levels, the teachers' questions aimed at 'synthesis' (2.33), 'application' (1.86), 'evaluation' (1.39) and 'analysis' (0.47) level respectively. According to this analysis, only 4.19 Iranian EFL teachers-generated questions were directed toward the highest three levels of Bloom's taxonomy, and 95.81 questions were aimed at the three lowest levels of Bloom's taxonomy. Therefore, this study indicated that Iranian EFL teachers were aiming their teaching and testing primarily at the lowest cognitive levels [44].

James Swart perform study about the Evaluation of Final Examination Papers in Engineering: A Case Study Using Bloom's Taxonomy.

The case study is the five years' examination papers (2002–2006), featuring levels I through IV. The low level question and the high level question was examined and expressed as a percentage. Final examination papers are used by academics to assess the retention and application skills of student.

As a result the Knowledge (on average, 45) and Comprehension (on average,7) dominate the major section of the examination paper. The number of multiple-choice questions (38 on average in the Knowledge objective) used in these examination papers further suggests that surface learning is being promoted. Application (on average, 31) and Evaluation (on average, 4) Synthesis (on average, 12) [45].

Garekwe he conducted a study aimed at describing and analysing the examination questions set over a four year academic period, at the University of KwaZulu-Natal

School of Nursing, in terms of Bloom's levels of cognitive domains. A total of 1319 questions from 39 examination papers from 2003-2007 were examined. The findings revealed that all six categories of the cognitive domains in Bloom's taxonomy were used across the four levels in the Bachelor of

Nursing (BN) programme. Overall about 57% of the questions were aimed at lower level (knowledge and comprehension) whilst only 43.4% were aimed at higher levels (application, analysis, synthesis and evaluation) [46].

Nazlia et al this work is automated analysis of the exams' questions the researchers tried to determine the appropriate category based on Bloom taxonomy. They used rule-based approach applies Natural Language Processing (NLP) techniques to identify important keywords and verbs, which may assist in the identification of the category of a question. Preliminary results indicate that the rules may successfully assist in the identification of the Bloom's taxonomy category correctly in the exam questions, but they didn't give a clear result [47].

Shahzad, Saqib; et al they performed study to analyze the S.S.C Biology Question Papers conducted by Board of Intermediate and Secondary Education (BISE) Bannu, Pakistan of 5 years (2005-2009) they used Bloom's Taxonomy. The study found that all Biology questions papers only Cognitive Domain are included in the papers and Comprehension level questions were most frequent, followed by Evaluation, Knowledge, Analysis and Synthesis respectively. No questions came from Application level. They concluded that SSC Biology question papers mostly covered more lower level skills (68.28%) than higher level skills (31.72%).

In the light of finding and conclusions of the study, they recommend that all examination papers should be according to Bloom Taxonomy to determine the future target of the learner. V and there must be a balance for marquisates among three categories (cognitive, effective and psychomotor domains) [48].

McBain Richard he conducted a simple classroom research project to examine how high up in the scale of Blooms taxonomy students were able to reach to understand higher order thinking skills when studying critical thinking questions. Two classes of senior high school students who had been studying in the same bilingual program for five years were compared by assessing their quality responses to a social studies project. The questions given were structured along the lines of the levels of Bloom's taxonomy from simple knowledge style questions to more complex evaluation types. The results showed that only 41.66% of students had a sound knowledge of the six levels of Blooms Taxonomy ranging from knowledge to evaluation. The remaining group 58.33% showed less understanding of the levels. This study clearly highlights the need for teachers to plan lessons with more accuracy and to know at which level to begin lessons with a view to improving student's higher order thinking skills [49].

Tarman, et al., performed an study on an investigation of the Cognitive level of questions in 6th and 7th grade Social Studies textbooks according to Bloom Taxonomy. The aim of this study was to check out whether high-order cognitive

domain skills were reflected in the pre-reading and assessment questions in Social Studies textbooks, and if so, to what extent. It was found that the 6th grade prep questions were at a low level (84.2%), open-ended assessment questions were at a high level (70.2%), and the multiple-choice assessment questions were at a low level (85%). The 7th grade prep questions were low level at 71.3%, open-ended assessment questions were high level at 66.6%, and 93.05% of multiple-choice questions were low-level questions. According to the results of the study, questions were not distributed in a balanced way in accordance with Bloom's taxonomy because there were more low level questions than high level questions and one of the most remarkable results of this research was that very few if any questions were found in some cognitive levels (i.e. evaluation) in the textbooks [50].

Tanalol, et al., examining Bloom's Taxonomy concept as a guideline in designing examination question papers in Mining exam questions. A good and reasonable examination paper must consist of various difficulty levels to tolerate the different capabilities of students. Here, the difficulty level of each question was determined from the criteria of keywords found in the question. A knowledge based approach and text mining technique was used to identify and extract information and keywords from textual content in the exam paper. Besides using the prototype system developed, an illustration of the overall analysis for level of difficulty of examination question paper was obtained. The outcomes from the system can be used as a guideline by the academician (exam question designer) to design/revise the exam paper according to requirements [51].

Naomee & Tithi, performed study to find out the reflection of Bloom's taxonomy on the learning outcomes of secondary social science curriculum of Bangladesh. Its objectives were to categorize the learning outcomes of secondary social science curriculum according to the Bloom's taxonomy and to analyze the reflection of Bloom's taxonomy on the learning outcomes of secondary social science curriculum. Data was collected by analyzing curriculum document using table of specification and interviewing curriculum specialists using interview schedule. The findings of the study revealed uneven application of the domains indicated by Benjamin Bloom and lack of consistency of the curriculum [52].

Kazim Sayed; et al., investigated the cognitive levels of examination questions with reference to Blooms' Taxonomy at Graduate level in Pakistan. About ten years (2001-10) previous English papers of Punjab University for Graduate students consisting of 541 questions were used as sample. In this work, the difficulty level of each question in the examination paper is determined from the criteria of keyword/s found in the question. The findings show that comprehension level is given the greatest prominence, which is followed by knowledge. Synthesis and evaluation levels are given lesser prominence while application and analysis are given least prominence [53].

Melehat GEZER, et al. they made evaluation of the exam questions of social studies course according to revised bloom's taxonomy. This research, it was aimed to investigate the written exam questions asked in the first term of the 2012-2013 academic year by the social studies

teachers according to knowledge and cognitive process dimension of Revised Bloom's Taxonomy.

Research data were collected via document analysis, one of the qualitative research methods. The questions were examined separately by the researchers according to Revised Bloom's Taxonomy. The findings obtained in the research suggested that the exam questions were represented knowledge level.

In the light of these results, it may be suggested that the social studies teachers mostly used the items measuring learning at basic level in their classroom measurement and evaluation practices [54].

E dussuriya, D.H; et al, in this study, Blooms taxonomy has been used to categorize questions according to their cognitive level to analyse the Forensic Medicine questions in the undergraduate medical curriculum of the University of Peradeniya, Sri Lanka with a view to determining the cognitive level of the essay and structured essay type questions. Essay and structured essay type questions of the first four years of the MBBS program from the year 2006 to 2012 were categorized according to the Bloom's Taxonomy. The study revealed that majority of questions were knowledge based while a considerable number were of the comprehension and application types. The proportion of questions of the synthesis and analysis were less while there was a moderate number of the evaluation type of questions. Observations made between the years revealed that there was a tendency for a decrease in the proportion of knowledge-based questions from the 1st year to the 4th years with an increase in the proportion of synthesis type of questions [55].

Lucas, K.C.et al. The purpose of this study was to analyzed, assess and compare the summative assessment of two third year level modules in the Bachelor of Science degree program. The questions posed in summative assessment opportunities were classified in terms of the cognitive levels identified by Bloom and the brain quadrants identified by Herrmann. Approximately 50 of the questions in the Biochemistry papers fell into the first two lower order Bloom's Taxonomy levels, whilst the remaining fell into levels 3 and 4, with no questions in the last levels of Bloom's Taxonomy. The questions posed in all of the Zoology papers covered mostly the first two cognitive levels of Bloom's Taxonomy with the highest percentage of all questions posed in all papers included in the first three levels. Correlation tests were done between student performances and the level of questions. No correlation exists between cognitive level and performance. Student achievement does not reflect the required understanding and ability to implement knowledge, or to engage with the subject matter at higher cognitive levels [56].

Choudhary et al, investigated the impact of Bloom's taxonomy in introductory computer programming course to improve student's learning experience and performance. A framework for the automatic classification of exam questions as per the Bloom's Taxonomy was developed which was able to extract the questions and then categorize them into appropriate level as per the Taxonomy. The framework was tested on students to identify the cognitive level of the students. Results showed that applying Bloom's Taxonomy in teaching learning process improved the

performance of students significantly by providing an appropriate feedback to the instructor about students' progress in their course. This helps instructors to concentrate more on the areas where students are weak in their course and which helps in deciding/changing the strategy for a teacher so that maximum learning happens in a class [57].

Choudhary& Raikwal, This Research investigated the impact of bloom's taxonomy in introductory computer programming course to improve student's learning experience and performance. They used in this research Text extraction and Text classification and Pearson's Co-relation analysis performed using IBM SPSS tools to find out the relationship, if any, among the various levels of Blooms Taxonomy.

As a result, from the analysis, the student is good in remembering level, his understanding level is not that much good, and he is also not able to apply the facts and the things which he has understand. He is quite good in analysing and evaluating the things. And in creating level he has also score very less marks. So, overall he needs to improve applying, understanding and creating level [58].

(Ali Roohani et al, 20143, p.51-67) have another study to Evaluate Four Corners Textbooks in Terms of Cognitive Processes Using Bloom's Revised Taxonom. It examined the extent to which these the textbooks could demonstrate the 6 cognitive categories. To facilitate analyzing and evaluating these textbooks, an agreement was made between the raters to codify the six levels of the cognitive dimension. Results revealed the of the processes of remembering and understanding in the textbooks got higher percentages and creating process constituted the lowest percentage of processes in all textbooks [59].

Narayanan, S & Adithan, conducted an analysis of end - semester question papers in Engineering with respect to assessing the proportion of questions involving Higher Order Thinking Skills (HOTS) as proposed by Bloom's Taxonomy. The analysis revealed that questions based on HOTS are more (above 63) in the case of disciplines like Applied Sciendces and Electrical Engineering. Questions based on HOTS are less in the case of disciplines like Bio Sciences, Computer Science, Information Technology and Electronics and Communication Engineering and

Mechanical Engineering. In respect of these disciplines, the low percentage of HOTS could be due to the nature of curriculum presently followed at the VIT University or due to inadequate exposure of faculty to the concept of HOTS in the teaching learning process [60].

Dhuha ABDULJABBAR et, al. proposed a new method to classify exam questions automatically according to the cognitive levels of Bloom's Taxonomy by implementing a combination strategy based on voting algorithm that combines three machine learning classifiers. In this work, several classifiers were taken into consideration. Then a combination algorithm was used to integrate the overall strength of three classifiers (SVM, NB, and k-NN). The classification model achieved highest result through the combination strategy by applying Mutual Information, which proved to be promising and comparable to other similar models.

These experiments aimed to efficiently integrate different feature selection methods and classification algorithms to synthesize a classification procedure more accurately [61].

Siti Hasnah, et al., this paper discussed the implementation of Bloom's Taxonomy concept as a guideline in designing reasonable examination question paper. A good and reasonable examination paper must consist of various difficulty levels to tolerate the different capabilities of students. The difficulty level of each question deposited in the question paper is determined from the criteria of keyword/s found in the question. They use two algorithms knowledge based approach and text mining technique to identify and extract information and keywords from textual content in the exam paper. Besides, using the prototype system developed an illustration of the overall analysis for level of difficulty of examination question paper.

As a result the lecturers can be able to make analysis of the examination questions set and can produce a quality exam paper based on the Bloom's Taxonomy [62].

Salmah Fattah et al., this paper presents the research ideas to develop a web application system that can be used by educator to design a good examination question paper. The research will employ human experts to establish the qualities that a good examination question paper must have by adopting the Bloom Taxonomy concepts into it. Here, the difficulty level of each question deposited in the question paper is determined from the keyword/s found in the question. To realize the ideas, a Question Bank is needed and will be used as reference for classifying the question difficulty level. The final product will be a web application system that contains Question Authoring Module, Question Retrieval Module, Question Analysis Module and Exam Paper Generation Module [63].

(Selvia et al, 2015, p.192) have another study. This study suggests a method that produces automation classification of Indonesian language question items based on new bloom taxonomy levels. The method includes identifying the question items' characteristic of nature language used. The identification is done based on lexical feature extraction and syntactic feature extraction. The features extraction output is classified by using algorithm of Support Vector Machine (SVM). The dataset used for the test is the question items from many lessons in elementary school. This research showed that the method suggested can be used to classify Indonesian language question items well. Word in Indonesian Language is not always recognized directly, because sometimes the word has affix. In order to know the labelling, there is deleting process of affix. Affix is the additional which attach in word and make new meaning [64].

Ömer Gökhan Ulum , perform study which is about th descriptive Content Analysis of the Extent of Bloom 's Taxonomy in the Reading Comprehension Questions of the Course Book. The aim of this study has been to find out to what extent Bloom's taxonomy is referred in reading comprehension questions of an English as a Foreign Language course book. The study analysed the course book's questions to check for lacked of the higher level of Bloom's Taxonomy. As a result from his research , he found that most of questions fall in the lower levels of cognition process and having a lack of steps in higher levels [65].

Joe Harrison, et, el, They used Bloom's Taxonomy to help designing examinations to aligning course material and assessment which is usually done by comparing what the students are taught to how students are assessed. When a student is assessed by an exam consisting of questions, the alignment process involves classifying these questions according to the cognitive process categories needed to answer them. This process can be time consuming if an exam contains many questions, and it can be easy to lose oversight of whether the questions in the assessment are representative of what is taught in the course material. They propose a software solution that uses machine-learning techniques to classify a courses' questions and provides a clear overview of the classes in Bloom's revised taxonomy present in these courses.

To achieve this, they built a training set and test set, the dataset contained over 1500 samples. The result of their model scored a good an accuracy of 75 compared to other company model which scored an accuracy of 40 [66].

Diñçay Köksal, et al., perform study which is about Language assessment through Bloom's Taxonomy. This study aims at identifying to what extent the exam questions of general English courses at universities refer to the levels of Bloom's Taxonomy. To a chive, this group of exam papers were analysed carefully in order to have a broad view about which steps of taxonomy.

The collected data were investigated by the researchers in accordance with cognitive knowledge dimensions of Revised Bloom's Taxonomy.

Most of the exam questions include only knowledge and comprehension levels of Bloom's taxonomy, the exam questions are based on the lower order cognition levels of Bloom's taxonomy while they lack the higher order cognition levels. The percentage of knowledge level contained in the exam questions is 81.7 while it is 18.3 .

For suggestions as a light of the findings of the study the researchers, suggest that English exam question should refer to both low and high level cognitive orders [67].

Dincay & Ulum, performed an analysis of exam questions for general English courses at Turkish universities to determine to what extent these question papers cover the lower and higher order cognitive levels of Bloom's taxonomy. The procedure of the study was based on descriptive content analysis design which describes the occurrence of the steps covered in both high and low order cognitive levels of Bloom's Taxonomy. The analysed exam questions were utilized and prepared by the lecturers appointed in the testing offices of the universities. Question stems based on each cognitive steps and key words referring to the cognitive levels of Bloom's Taxonomy were employed to diagnose which levels of thinking order were included in the overall analysed exam questions. It was found that the exam questions include only knowledge and comprehension levels of Bloom's taxonomy. The percentage of knowledge level contained in the exam questions is 81.7 while it is 18.3 for the comprehension level. It was also clear that even between the percentages of knowledge and comprehension levels, there was a high gap [68].

Chen & Xiao, this study is one of the first endeavours toward automatic analysis of texts in students' analytical writings in Chinese. Inspired by previous studies on text categorization based on Bloom's taxonomy, this study attempts to classify the cognitive levels reflected in the analytical writings. In particular, a rich set of features at the lexical, syntactic and semantic levels will be exploited in constructing the classification models. To filter out redundant features, a feature selection process will be applied, which will further improve the performance of the classification models. Moreover, the most significant features will be analysed in terms of their usage in everyday discourse. The contribution of this study lies in three folds. First, it is the first study to identify cognitive domains of Chinese analytical texts based on Bloom's taxonomy; second, it explores and exploits a comprehensive set of text features involving lexical, syntactic and semantic evidence, and applies the combined features to this relatively new application question [69].

VI. PROPOSED APPROACH

In our approach, The Bloom classification will choose in this study to evaluate the final exam questions prepared by the teacher of computer colleges in Sudanese universities in the courses of computer science and information systems. Because of educators view the teaching and learning process is a comprehensive and complementary manner and they believe in dividing the educational objectives into three areas, as it is well known, and that Bloom's classification is more appropriate for evaluation because the Bloom classification can be used in various curricula.

VII. CONCLUSION

The related literature is reviewed from Sudan and regional countries including Arabic countries and international countries in which the researcher reported on 55 related literature. Majority of the researches were on Bloom's Taxonomy have been conducted abroad. Very few researches done in Sudan. Out of the 55 literature reviewed, only 8 studies conducted in Sudan were found which covered the period from 2009 to 2018, that is within a interval of 8 years.

The researcher reviewed 15 studies in Arabic's region in countries like Saudi Arabia, Yemen, Ghazza, Palestine, Jordan, Syria, Iraq, Libya and 32 studies which were conducted internationally in countries like USA, UK, Turkey, Iran, Malaysia, South Africa, Bangladesh, Pakistan, Sri Lanka and others, which were conducted from the year 2001 to 2018, covering a interval of 17 years.

In the 55 reviews analyzed research, 34 were concerned with analysis of final questions according to the cognitive levels of Bloom's taxonomy and 29 studies found that the majority of the questions analyzed belonged to the Lower Order Cognitive Skills and very few from Higher Order Cognitive Skills. 9 studies were concerned with developing a framework for the automatic classification of exam questions. As per the cognitive levels of Bloom's Taxonomy, that is, the blooming of examination question papers, 7 of them were English language. One studies in Chinese language and one is Indonesian Language. 8 studies were conducted on textbook on finding out the cognitive skill level; 1 studies were concerned with training teachers

on setting higher order cognitive questions; 1 study were conducted on classroom question; 1 study conducted in web application system that can be used by educator to design a good examination question paper.

In the 8 studies performed in Sudan or by Sudanese researchers, Sati Jomaa, 2009; Mohammad and Ahmed Gumaa Siddiek, 2010; Ibrahim Mohamed Alfaki, 2014 they conducted studies for Sudan secondary schools certificate examinations papers in different subjects they found that majority of the questions concentrated on knowledge and comprehension levels. Hassan Abu Zaid, 2018, performed study to analyse and evaluate the Achievement of examination of Technical Education Syllabus in the College of Education for the Years, University of Sudan.

Addin et al. 2011 and Addin and Anwar, 2016 performed researches in the computer programming where they compared some of algorithms for the automatic classification of exam questions as per the cognitive levels of Bloom's Taxonomy. Almonzer Salah NoorAldaim, 2018 his research is to design model to convert manual exam questions to electronics exam questions in Sudanese Universities

Most of the previous studies have used Bloom's Cognitive Domain classification in question classification, most of this classification were manual, and few were automatics classification. These studies used the descriptive method and percentages in analysing the questions, although they were differed in the academic stages of which the questions were analysed, but varied in the courses in which the questions were analysed.

Also some of the previous studies have shown that various of the studies dealt with the classification ability of the objectives including handling of questions, characteristics of behavioural goals and their criteria, using the Bloom classification, and some studies dealing with comparison of methods to evaluate and assessing questions.

Through these studies we note that, most of the result of the previous studies have shown low-level written questions (remember, understand and application) came first from teachers' exams. It also showed that the percentage of high-level in the written questions (analyses, synthesis, evaluation) came in the second rank of teachers' interest, this revealed the need for the necessary situation to develop teachers' ability in different skills in formulating questions.

Within the limits of the researcher's knowledge, no study has been conducted in the automatic classification of final examinations question in any Universities in Sudan. Particularly in colleges of computers science that the present study on final examination question paper setting using the cognitive domain of Bloom's Taxonomy will be useful to know at what level we are teaching and examining our students. It will be helpful to understand where the cognitive levels of teachers and students are functioning at present and where we have yet to go. We hope that the results of this study will provide a way to develop good training programs for teachers with new and improved teaching and evaluation techniques.

VX. REFERENCES

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