AUTOMATIC GENERATION SYSTEM OF ESSAY QUESTIONS FROM ARABIC TEXTS

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ABSTRACT

This paper aims to describe the called Automatic Generation System of Essay Questions from Arabic Texts. Assist teachers in Presentation system to automatically generate essay questions from Arabic texts instead of preparing the questions the manual methods to assess the achievements of the learners learn. And save time and effort it takes to set up banks in questions.The study presents Automatic Generation System of Essay Questions from Arabic Texts.

KEYWORDS: *Questions Generation (QG), Arabic morphology, Essay questions, Assessment.*

I.   INTRODUCTION

Assessment is the systematic collection of information about student learning using the time, knowledge, expertise, and resources available, in to form decisions that affect order student learning [1],It is the process used to collect information about learning progress toward educational goals [2], Also it is used to diagnose learning problems and promote further learning, in addition to evaluation learning out comes[3],.Assessment aligned to standards provide detailed information about what students know about specific learning targets and standards[4].

Questions are used from the most elementary stage of learning to original research. In the scientific method, a question often forms the basis of the investigation and can be considered a transition between the observation and hypothesis stages. Students of all ages use questions in their learning of topics, and the skill of having learners creating "investigable" questions is a central part of inquiry education. [5],Questions used in conjunction to identify learning disabilities. Questions content samples and curricula used in schools [6],Questions are most valuable when students respond, correctly or in correctly, because their response encourage student engagement [7],Essay questions are the traditional type of tests widely used in our examination system a few questions are given in

the test and the examinee has to give a detailed answer to each question the examiner scores the answer as a whole and gives credit for the overall impression made by the essay. Essay questions are constructed from constructed or ''open – ended'' questions that require students to collect related thoughts, formulate an answer, and write out their response [8].

Natural language is an artificial intelligence branch which has the ultimate goal to invent theories, so NLP gives computers the ability to understand the way humans learn and use language is the most challenge inherent in natural language processing [8], It is the automated approach to analysis text that is based on a set of theories and a set of technologies together [9], The NLP tools and techniques parse linguistic input (word, sentence, text,) according to the rules of the language (like lexicon, corpus, and dictionary) [10].

Over the last few years, Arabic natural language processing (ANLP) has gained increasing importance; these applications had to deal with several complex problems pertinent to the nature and structure of the Arabic language [11]. These issues in the ANLP in Classical Arabic (Verb, Subject, and Object) form is used, there are forms in dialects like SVO (Subject, Verb, Object) this forms used in ANLP, and change the sentences structure and sometimes the meaning of the sentence [12].

Question Generation (QG) is important components in advanced learning technologies such as intelligent tutoring systems. It is an essential element of learning environments, help systems, information seeking systems, and other applications [13], It is useful for knowledge assessment-related tasks, by reducing the amount of time allocated for the creation of tests by teachers a time consuming and tedious task if done manually [14], QG aims at generating questions from text and has become a vibrant line of research. Generating questions. Another benefit of QG is that it can be a good tool to help improve the quality of the Question Answering (QA) systems [15].

In view of this, the current study presents system to help in Questions Generation from Arabic Texts. The system consists The System consisted of four main phases, phase one is the pre-processing phase, second phase is the Text processing, the third phase is the questions Generation, and the fourth phase is the Post-Processing. The system will generate Essay questions from the Arabic sentences, using a

syntactic parser. A part of speech tagger and named entity recognition.

II. PREVIOUS WORKS

This thesis aims to introduces a system for a Fill-in-the-blank questions or cloze items, with generating cloze items for prepositions, and poses problems for non-native speakers of English. The quality of a cloze item depends on the choice of distract- tors based on collocations and on non-native English corpora to generate distractors for only on word frequency [16].

Develop a system to generate questions automatically from large text corpora User questions. a comparison of the retrieval performance using only automatically generated questions and manually-generated questions 15.7% of the system responses were relevant given automatically generated questions, while 84% of the system responses were deemed relevant with manually-generated questions [17].

Presented a way to automatically questions generate ,they generated fill-in-the-blank questions and distractor answers for reading comprehension tests using heuristic scoring measures and a small evaluation set [18].

Develop technique to generate cloze questions (gap-fill questions) which uses sample sentences from Word Net. They then refine this technique with linguistically motivated features to generate better questions. They used the Cambridge Advanced Learners Dictionary (CALD) which has several sample sentences for each sense of a word for stem selection (GFS). The new strategy produced high quality cloze questions 66% of the time[19].

Presented a system to generate Multiple-Choice Test Items)MCTI) from medical text. Initially key set is enlarged with NPs featuring potential key terms as their heads and satisfying certain regular expressions. Then sentences having at least one key are selected and the terms with the same semantic type in UMLS are selected as distractors. In their manual evaluation, the domain experts regarded a MCTI as unusable if it could not be used in a test or required too much revision to do so. The remaining items were considered to be usable and could be post edited by the experts to improve their content and readability or replace inappropriate distractors. They have reported 19% usable items generated from their system and after post editing stems accuracy jumps to 54% [20].

This study presents an overview of the Generates cloze questions for assessing the comprehension of a reading text. The system enables the creation, answering, and scoring of text comprehension questions. Cloze questions are generated by parsing a natural language sentence; a random word is deleted and then three random distracters of similar difficulty are chosen from the text. [21].

Present the automatic generation of MCQ items from domain ontologies. The semantic relationships between various entities in the ontology are used to assert true/false sentences, which are then used for generating the distracters in question items. The authors describe three main strategies for question generation: class, property, and terminology-based strategies [22].

III.THE PROPOSED SYSTEM OVERVIEW

The Proposed System consisted of four main phases:

First phase : the pre-processing.
Second phase : Text processing.
Third phase : questions generations.
Fourth phase : post -processing and each phase contains some steps. These phases are illustrated in Figure 1.

The proposed system automates the process of generating Essay questions from Arabic texts. It is useful for teachers for the generating questions automatically Instead of the manual method. The proposed system automates the process of generating Essay questions from Arabic texts, based on pre-generated corpus patterns. The system as well uses Stanford Arabic Natural Languages Processing (NLP) tools to generate a morphological tagged tree from the Arabic text, which then be matched with the patterns to form the question , and using The Tregex Tree Searching Language and Tool, Part of Speech (POS) tagger, Named Entity Recognition (NER).
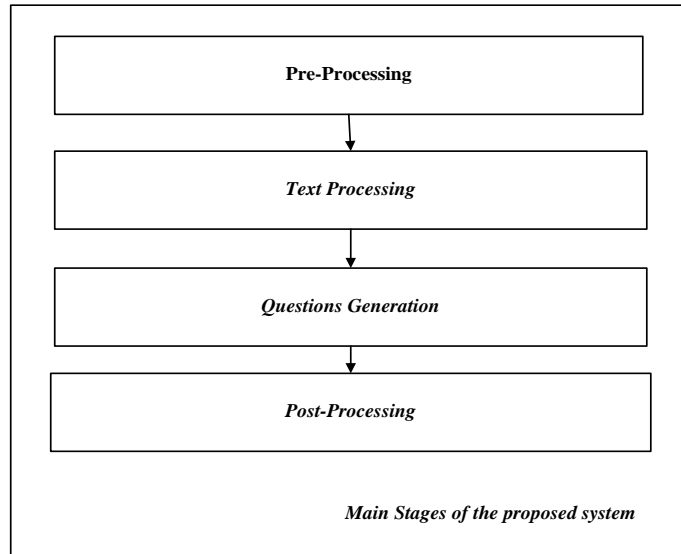

Pre-Processing

Text Processing

Questions Generation

Post-Processing

Main Stages of the proposed system

Figure 1: The proposed system phases (SEAIF)

FIRST PHASE:
First phase: Pre-Processing
         This phase aims to validate input data and prepare it before processing text. The complex structure of Arabic language contains many issues. It has very complex morphology, such as a (Alhmza - Almadda - Diacritic- Tatweel). The end goal of this stage is to get pure text and remove diacritic and normalize Arabic characters and unify a free from of Alhmza.

Second phase : Text processing
         This phase aims to Sentence Analysis Processing ,segmented Word file and sentiment the sentences using the point. Then every sentence is carried out these operations by removing the styling, Normalization of Word Segmented, then save the sentence before and after processing (Sentiment Extraction normalization - segmenter in the database) .Proposed System tends to solve these issues through three main steps:

- Sentiment Extraction
- Sentence Arabic Normalization
- Sentence Word Segmentation

Third Phase: Questions Generation
After the phase Arabic word processing (Word file) of the - normalized sentence -sentence parsed -person entity-location entity-organization entity seen entering the stage of phase formation in question and get questions using Regular Expression. System generates two types of questions first type essay questions and the second type questions objectivity.

> *Essay questions (answers short)*
The figures are identified by using expressions is stage is divided by the, If the figures are identified by using Regular Expressions. It is a way to extract information from the tree of the text. And determining sentences that fit the composition tregex question using a tool to extract the Pattern and model question Using

Stanford Tregex Pattern. For example these figure.(S < VP < NP >.

> *Definition Questions*
This type of question to Extracting definitions from Arabic sentence. By building manually the patterns. This method is the most used in QG systems.

Fourth Phase: Post – Processing
         This fourth phase aims to Process the saved question from the previous phase and output the final question list. The contain three steps depending on the questions type. . Essay question removes the rest of the sentence and add a question mark (?). The system offer some additional features for the examiner to generate a questions and finally preview the result and save it to the hard disk.
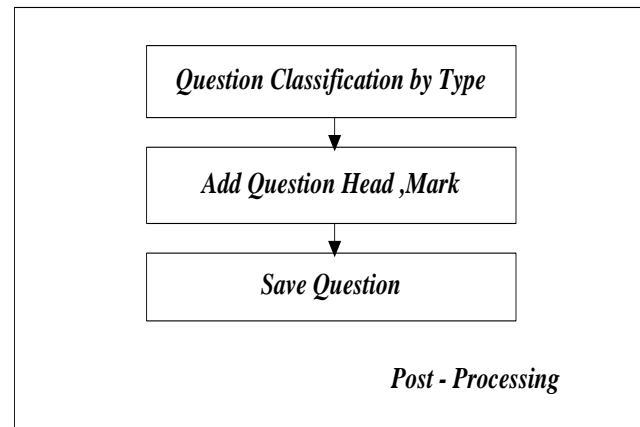

Figure 2: The Post – Processing phases

IV. EXPERIMENT
The first type: Essay questions
-First hypothesis(The proposed system the ability to generate a variety of questions per sentence).

Table 1: the table shows the results of essay questions in the standard *a variety*

Questions	Mean	Std. Deviation	Chi-Square(a)
q1	3.65	.489	23.6
q2	3.50	.761	18.8
q3	1.55	.826	18.8
q4	1.40	.754	27.6
q5	3.85	.366	39.6
q6	1.55	1.050	26.8
q7	1.60	.821	15.2
q8	3.65	.489	23.6
q9	3.65	.489	23.6
q10	3.55	.510	20.4
q11	3.65	.489	23.6
q12	3.45	.759	23.6

The results indicated agreement opinions of experts and arbitrators about the proposed program to generate essay questions from Arabic texts. Where opinions were positive about the proposed system and there was no substantial difference between their views about the proposed system. This confirms the validity of the first hypothesis of the study hypotheses (The proposed system the ability to generate a variety of questions per sentence).

RESULTS

The results indicated agreement opinions of experts and arbitrators about the proposed system to generate questions from Arabic texts. Where opinions were positive about the proposed program and there was no substantial difference between their views about the proposed system. This confirms the validity of the five hypotheses of the study hypotheses (The proposed system the ability to generate essay questions is characterized by Clearness and lack of ambiguity significantly).

Table3: the table shows the Performance of (AQG)Essay Questions.

Evaluation Criteria	Relevance	Question Target	Syntactic	Clearness	Variety
Mean %	91.6%	87.2%	82.75%	85.75%	73%

Results essay questions from Arabic texts (mean) positive opinions about the program of the arbitrators and it turns out that of the following percentages of the criteria evaluated question generated of the program Mean for standard Relevance 91.6%, and the Mean standard Question Target87.2%, the Mean standard of syntactic82.75%, and the Mean for standard of Clearness 85.75, and the Mean standard of Variety 73%, as shown in Table3.
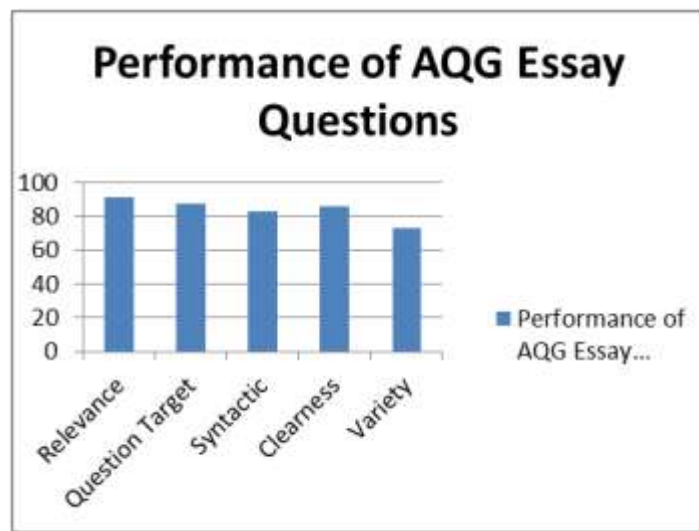
Figure 3:The table shows the Performance of (AQG)Essay Questions.

IIV. CONCLUSION

This paper study experiment and results. It automates the process of generating Essay questions from Arabic texts. The proposed system the ability to generate questions using Evaluation Criteria of questions generated by the system, Relevance‹question target‹Syntactic‹Variety‹clearness).

The accuracy reaced 80% in comparison with the views of arbitrators. That means AQG is ability to generate questions.It consists of four main phases:

First phase the pre-processing,Second phase Text processing,Third phase questions generations and Fourth phase post –processing.

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