

A multiple Kinds of e-Exam System for The Deaf & Dumb : Developing & Evaluating “view points of experts in review”

Dr.Karim Q. Hussein, Assist.Prof./ Computer Science Dept./Faculty of IT/ Al-Isra University /Amman/Jordan

Dr.Mrs.Maha A. Al-Bayati, Assist.Prof./Computer Information Systems Dept. /Faculty of Computer Science / Applied Sciences university/Amman / Jordan

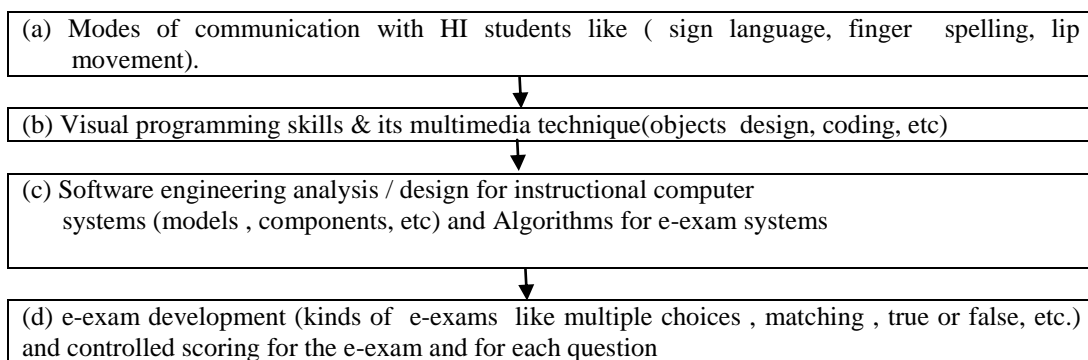
Prologue

This paper presents a system of e-exam modules (eXMs) for the Deaf and Dumb(D&D). However this system can generate five kinds of eXMs. The kinds are: Multiple Choices , Fill in Blanks , Matching Between Words in Two Columns, Yes or No and Answer in One Word. The first user of the system is the instructor who is asked to submit his questions with the correct answer for each question. The system will generate an eXM for the D&D students regarding the entry questions by the instructor. Therefore each of the programs for the instructor and the D&D students are built so as to be empty templates. The generated eXMs could be framed according to the desired material by the instructor. Because the eXMs are planned to examine the D&D students , they must be presented by the multiple modes of communication “ Sign language and Alphabets finger spelling”. However the authors linked 3000 video cuts of sign language and 52 pictures of Alphabets finger spelling with the source. To evaluate the effectiveness of the whole system “teacher project & students project” a case study has been applied by the system to generate an experimental e-exam module (eXM) for real D&D class. This case study has been evaluated by 21 different experts in many countries (India , Iraq and Jordan). The authors used a questioner to discuss the reflecting responses of experts who has viewed/tried the experimental eXM. The results of the answer’s analysis of the questionnaire towards the system mostly has expressed positive indications for both, the teachers of D&D students as well as for the D&D students.

I. Statement of Problem

The authors summarized the problem of this research in the following diagram:

If a teacher would like to develop eXM for the D&D students he must be able to do/know the following:



As per the above diagram ,developing eXM for the D&D students requires a specific skills in many fields besides it takes long time (to develop an e-learning module of 15 minutes for normal student requires 75 work hours , defiantly for eXM for the D&D students, the task would be more difficult). That is the problem. What is the solution ? *it is to develop an authoring system which is able to generate any kind/kind of eXM of the desired subject, supported by controlled scoring for the D&D student.* Thus the instructor can use this system easily to generate his desired eXMs. The instructor enters his questions and the correct answer only , the system would generate the needful eXMs.

II. Objectives of research

The research aims at:

- 1- Developing an authoring system of eXMs for the D&D students. This system is planned so that to cover all kinds of eXMs and supported by controlled scoring.
- 2- Applying this system via case study of experimental eXM, then evaluate the experimental eXM by selected sample of experts , teachers of D&D students and professionals in the area of research.

III. Presentation of the system

The following diagrams show the block diagram of the system :

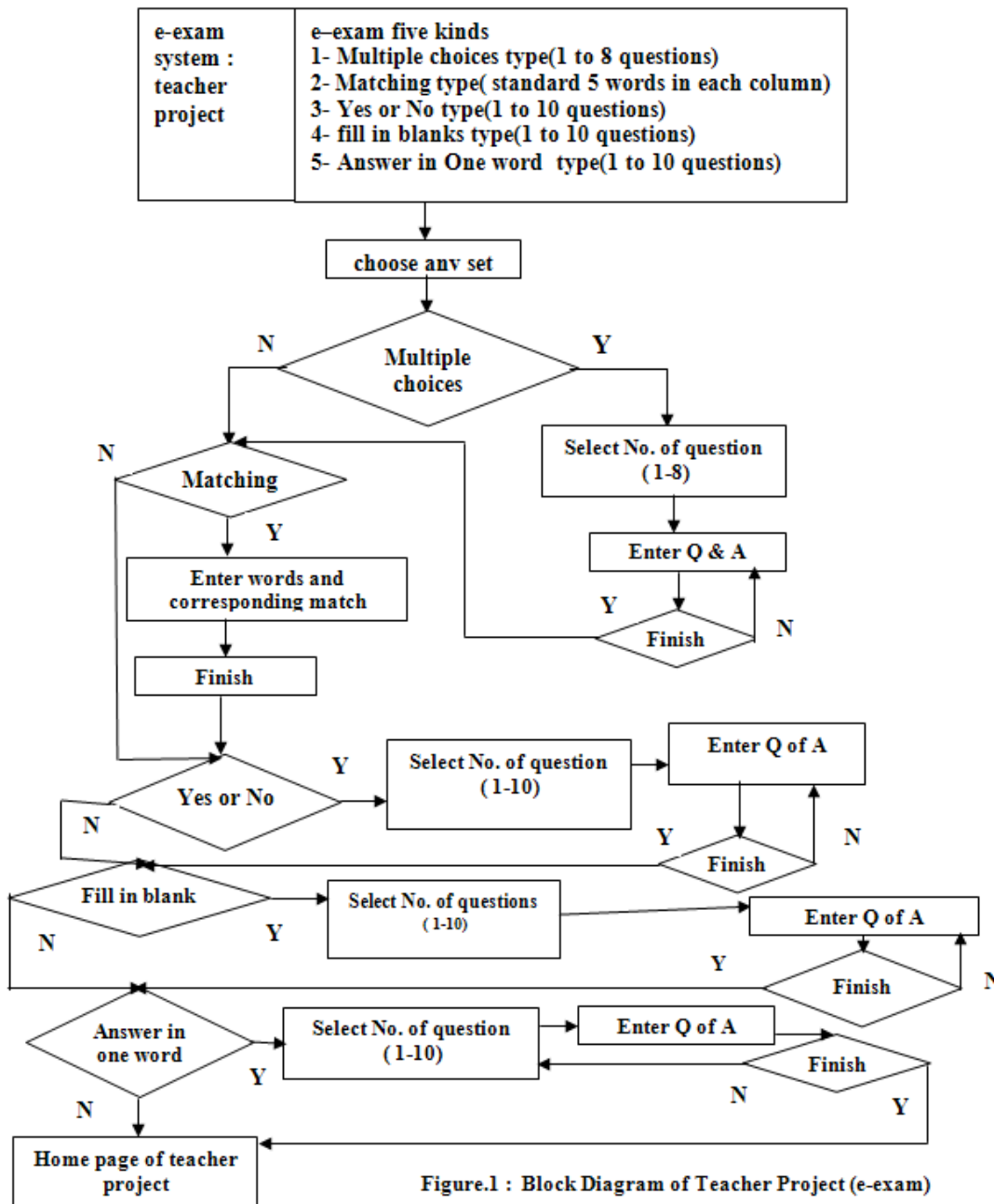


Figure.1 : Block Diagram of Teacher Project (e-exam)

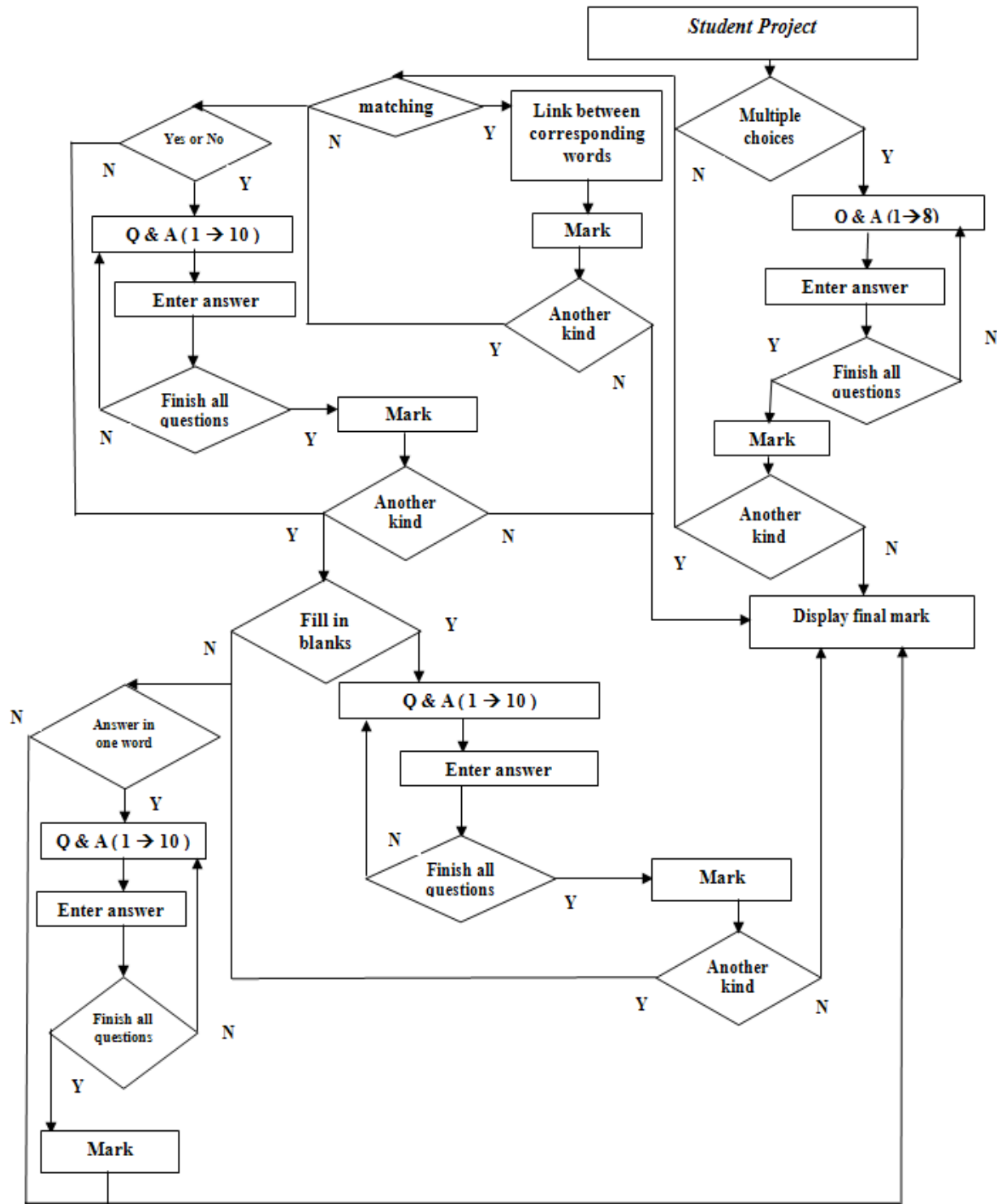


Figure.2 : Block Diagram of Student Project (e-exam)

IV. Applying The System

The system has been tested via case study of the topic of (HISTORY OF MAN). We shall display a real run-out forms of Teacher project and the corresponding forms in the Student project.

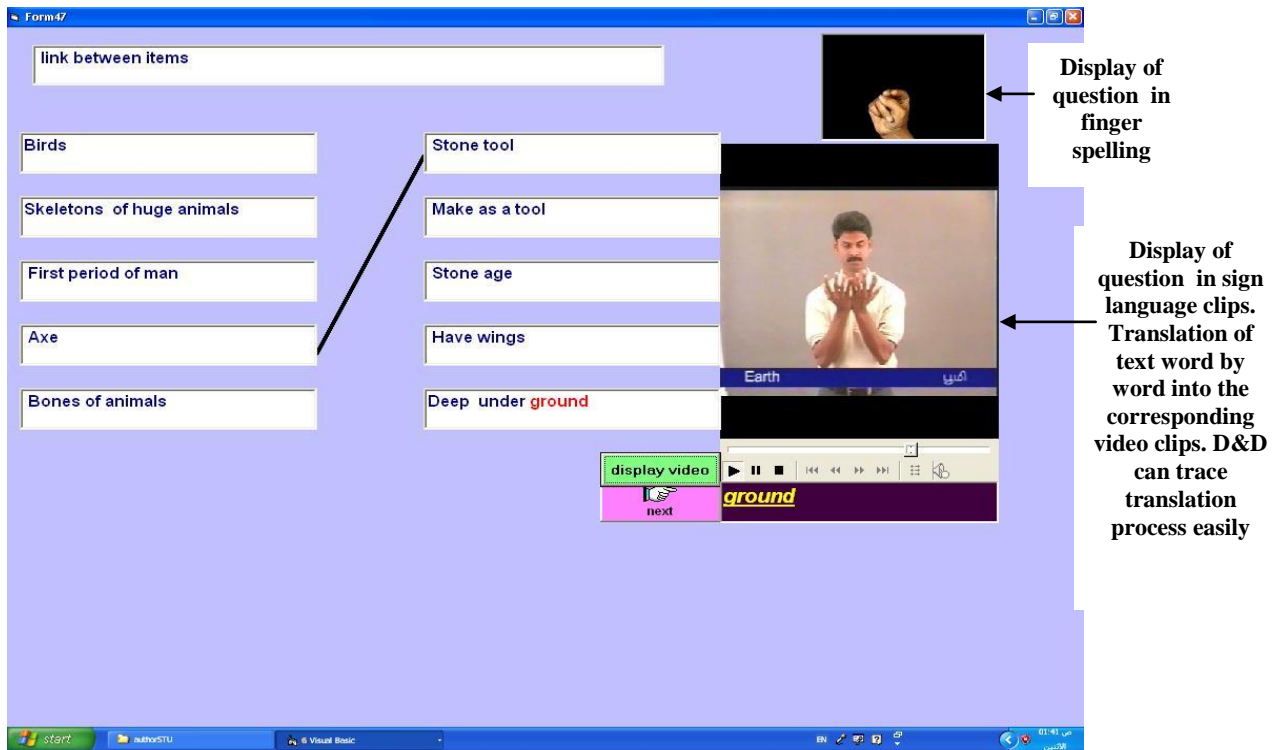
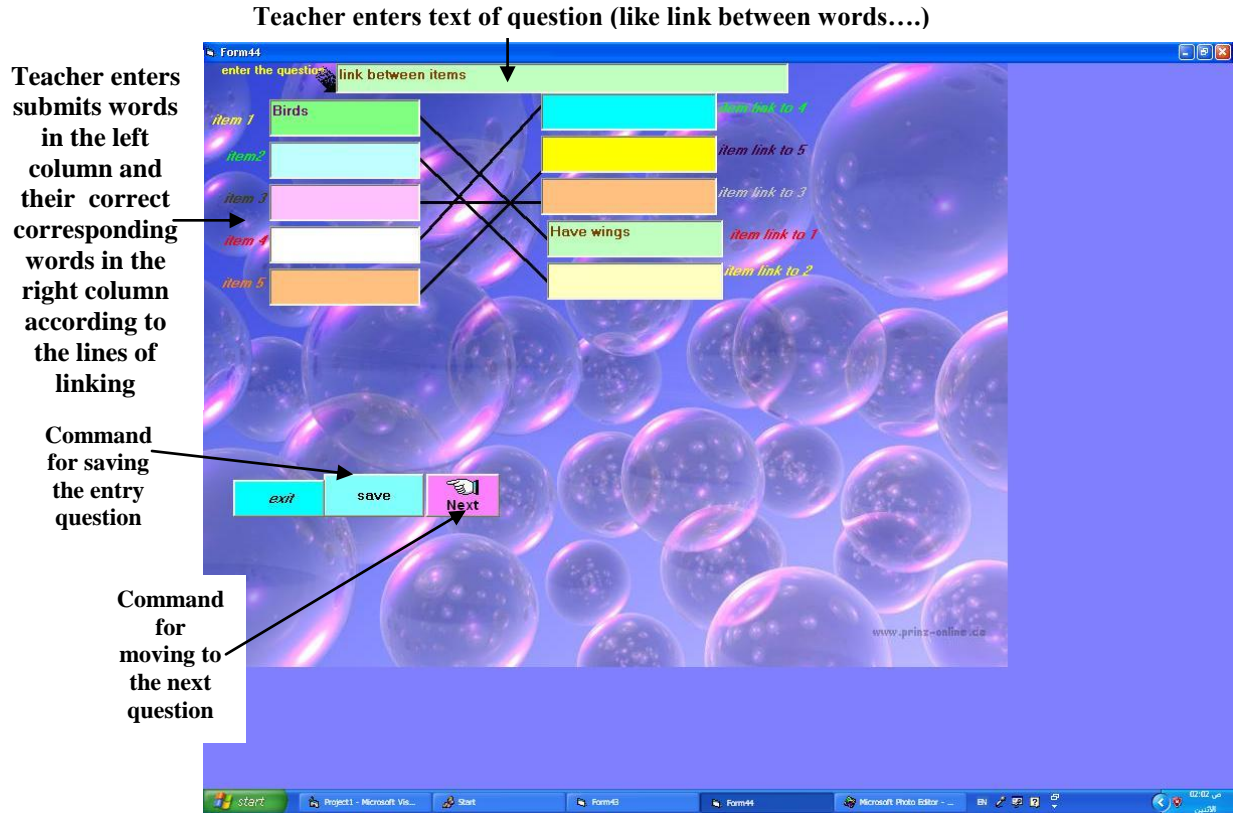
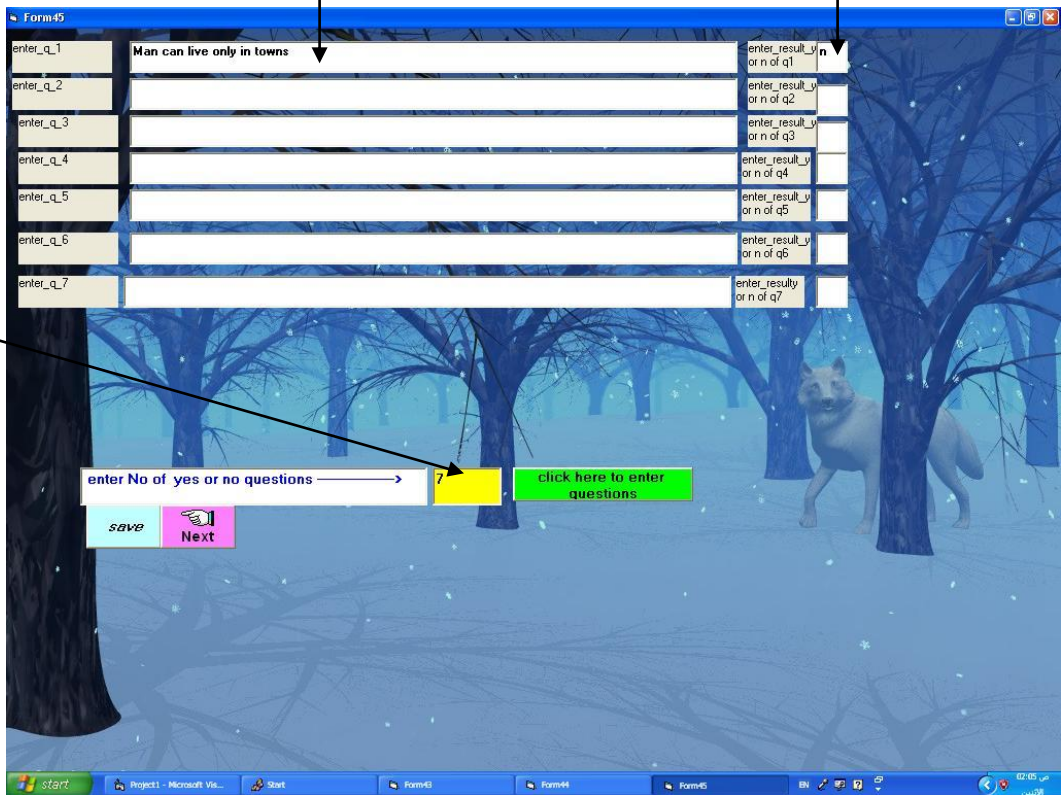


Figure3: real run-out forms of experimental case study for topic of History of Man, form of teacher and corresponding form for the student , The teacher is asked to submit words in left column and their corresponding words in right column. D&D read the generated question and answer (Matching kind)

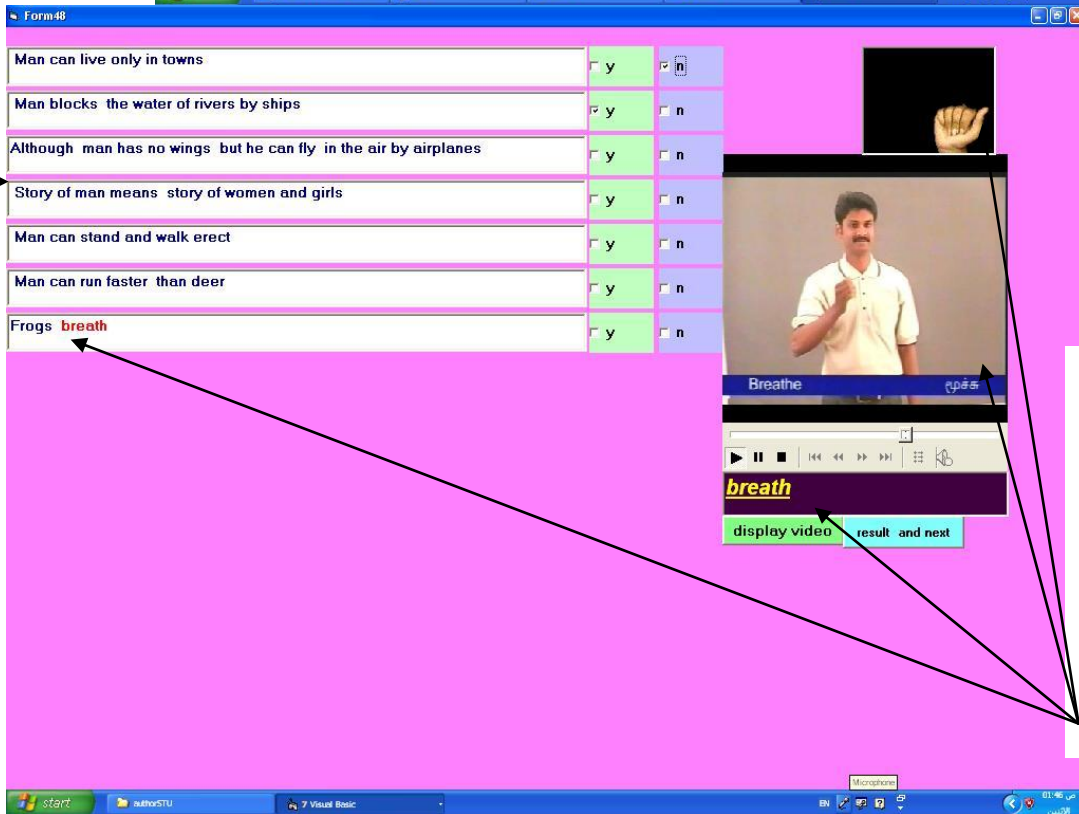
The teacher entered manuscript of question 1

The teacher entered correct answer (n)

The teacher selected 7 questions of Yes or No kind. Then 7 empty templates were displayed so as to be filled by the teacher



The seven questions were displayed in the D&D screen according to entry of the teacher.

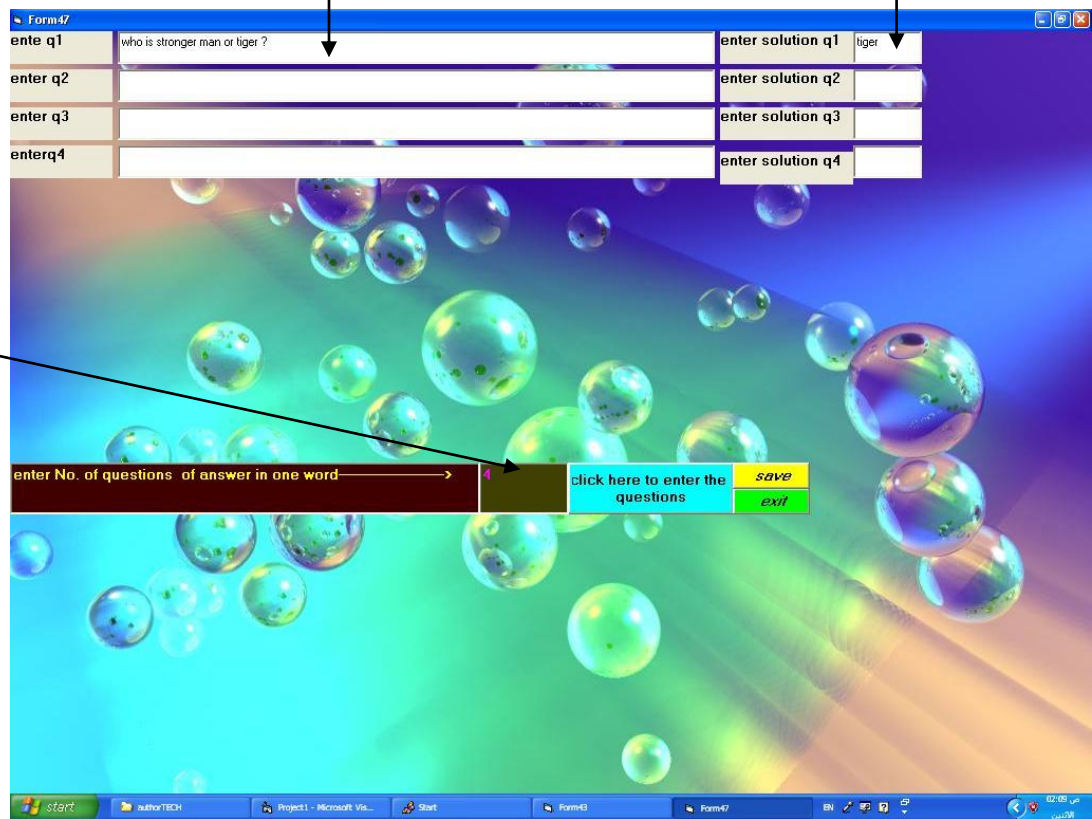


The word breath is under process of translation. Sign language clip is displayed here also finger spelling of the word breath is displayed simultaneously. Also it is displayed in red color in the original text so that D&D can trace the question

Figure4: real run-out form of teacher and corresponding form for the student, The teacher is asked to select number of question in Yes or No kind then submit texts of questions and there correct answer (either Y or N). in the student project D&D student finds the 7 question which were submitted by the teacher. D&D must trace translation then answer the questions

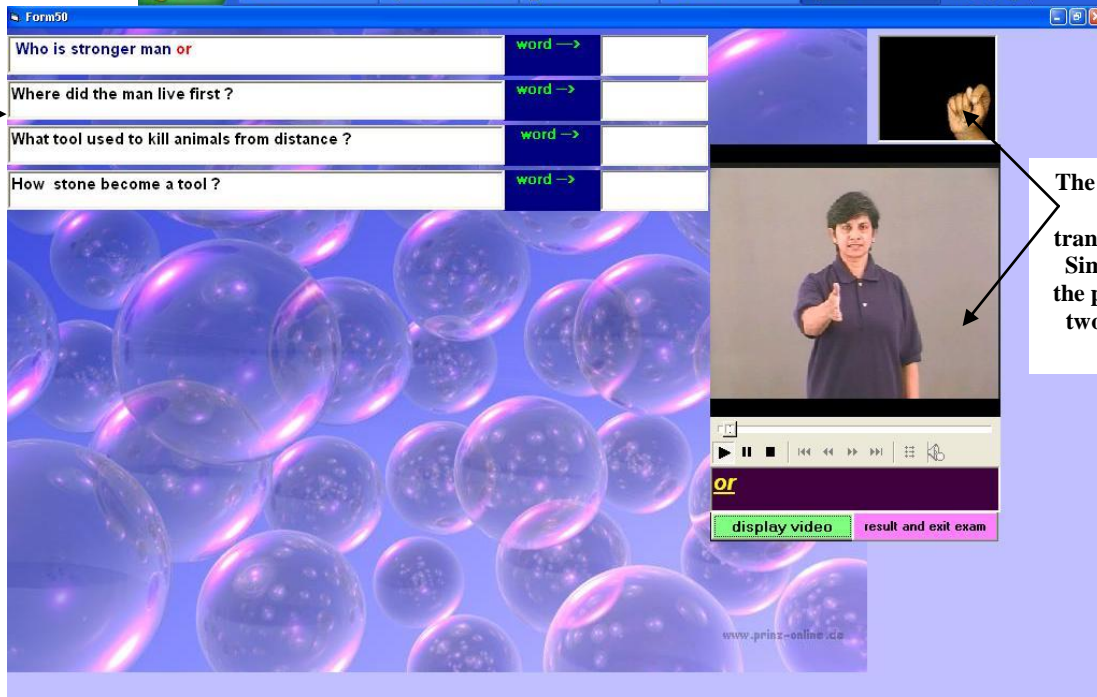
The teacher entered manuscript of question 1

The teacher entered correct answer (tiger)



The teacher selected 4 questions of answer in one word kind. Then 4 empty templates were displayed so as to filled by the teacher

The four questions were displayed in the D&D screen according to entry of the teacher.



The process of translation . Similar in the previous two pages

Figure5: real run-out form of teacher and corresponding form for the student , The teacher is asked to select number of question in answer in one word kind then submit texts of questions and there correct answer (the correct word). In the student project D&D student finds the 4 question which were submitted by the teacher. D&D must trace translation then answer the questions by entering the correct word for each question

V. Evaluating the generated eXMs

The experimental eXMs which have been generated by the system have been examined by a sample of experts , professionals and teachers of D&D students to evaluate the system.

The following questionnaire shows the analysis of answers of this sample (21 experts) regarding each item. However there is an open item so as the expert can expose any suggestions or comments or advantages or disadvantages.

No	Item	Levels		
		high	middle	low
	Teacher Project			
1	System allows teacher to introduce e-exam modules for any topic.	80.95%	19.04%	
2	It allows to introduce a lot of e-exam modules on the Same Computer.	85.71%	14.28%	
3	Teacher can use the system with simple computer skills.	90.47%	9.52%	
4	Covering five types of e-exam is suitable for testing .	80.95%	14.28%	4.76%
5	System allows teacher to enter any number of questions ,	76.19%	23.81%	
6	It allows teacher to select required kinds of e-exam.	71.43%	28.57%	
7	Marks attached by the system for e-exam satisfies teacher requirements.	61.90%	23.81%	14.28%
8	Teacher can introduce e-exam modules for D&D learners even without experience in sign language or finger spelling.	85.71%	14.29%	
9	Colors and fonts of run out project are suitable.	38.09%	38.09%	23.81%
	Student Project :			
10	The e-exam modules are easy to be used by HI learner .	57.14%	42.86%	
11	HI can use the system even with simple computer skills.	57.14%	42.86%	
12	HI learner takes the central role of learning / instruction process.	71.43%	28.57%	
13	Color & fonts of forms are suitable.	42.86%	33.33%	23.81%
14	Presentation of Multi-media for (Finger spelling & sign language) is effective.	57.14%	42.86%	
15	Video clips of sign language (Indian dictionary) are suitable.	66.67%	23.81%	9.52%
17	Multi-kinds of e-exam process examine D&D Learner effectively	71.42%	19.05%	9.52%
18	HI learner could easily use the interactive exam technique .	71.42%	19.05%	9.52%
19	Display finger spelling cuts for words which have no corresponding sign language file is suitable .	71.42%	23.81%	4.76%

VI. Discussion of questionnaire's answers analysis

The authors summarized items of discussions as following

a- Item 1 , 2 , 3 are in good scale. The authors have designed the system so that to be easy used by the teacher. The teacher is asked only to submit his own question with the correct answer and save the submission.

Also the authors designed their system so as to generate multiple eXMs in the same computer.

b- Items 4,5,6,7 are in good scale too. The authors designed their system to cover all requirements of the teacher of D&D to develop any kind/kinds of e-exam modules for any desired topic. To generate five kinds of eXMs with controlled scores successfully, it is expected such these positive indications.

c- Item 8 is also reflecting positive response. The system can translate all the entry questions and answers from normal text into sign language and finger spelling. such this translation via multimedia technique requires great labor by the authors.

The teacher of D&D needs not to develop coding of e-learning or learn sign language or finger spelling, our system is developed to do so.

d- Colors and fonts for teacher and students included some weakness (items 9 and 13). According to these items the authors redesigned colors, fonts, and pictures of backgrounds so as to be suitable, clear, simple and fonts in opposite colors of backgrounds.

e- Items 10 and 11 are about in the positive scale. D&D student can use e-exam modules easily with simple basic computer skills. some weakness because D&D student may be prefer e-games and tutorials more than exam. Exams always cause some tension to the student, e-exam for D&D may be the tension duplicated, therefore we expect some negative responses regarding these items.

f- Item 12 is in the positive scale. The authors designed the system so that D&D can use the eXMs individually and without direct guide by the teacher. The system allows D&D student to take the major role. such individualization and taking the central role by the D&D via teaching/learning process is highly recommended by the instructional technology fundamentals/literatures.

g- Items 14 and 15 proved positive indication about multimedia technique to translate text in to corresponding video clips of sign language and finger spelling pictures.

h- Items 17 and 18 are good responses. The system can exam D&D students successfully.

i- Item 19 refers to positive indication. Translation of text to sign language and finger spelling via multimedia technique represents the core of our system. The authors tried their best to allow D&D tracing the translation word by word and letter by letter effectively.

j- About the open item, the authors summarized comments of experts as following

1- Some expert asked if it is possible that the system can process e-exam of any language not only English like Arabic. Such process requires very complex coding particularly the source is in VB software, However VB processes only English files address.

2- Some experts asked if there is a facility to translate into lip movements clips besides finger spelling and sign language. The authors did not find a specific dictionary for lip movements (they found in India the Indian sign language dictionary). If the authors can obtain such dictionary they can cut these CDs of dictionary into thousands of individual cuts to frame the needful vocabulary of lip movement then link this vocabulary with the source similar to the process of linking sign language vocabulary.

3- Some experts suggested to link the real voice of characters in the sign language cuts, because some D&D students are partially of hearing impairment. Therefore these D&D student can get the benefits of the remaining sense. But Linking of the real voice of characters could not be accomplished. The original CDs of the Indian Sign language dictionary are free from the real voice and there is no technique to add the voice to the original clips. The authors recommend strongly for sign language clips and lip movement clips that they must include the real voice of the characters.

VII. Conclusion

The authors summarized their conclusion as following:

1- The system could be considered as Authoring tool of eXMs which covers all kinds of e-exam (multiple choices, matching, Yes or No, fill in blanks and answer in one word), with flexibility for the teacher to develop his eXMs for any desired topic and he can select his kind/kinds of e-exam. Also he can submit his number of questions. The final score is displayed on the screen.

2- The obtained feedback from the experts who tried/showed the experimental generated eXMs is mostly reflecting positive indications about the advantages of the system for the teacher as well as for the D&D students, particularly the system's facilities and its easily, flexibility in using for the teacher and D&D student. Besides its conveniently of output for the teacher as well as D&D student.

3- The system provides individualization in teaching / learning process. Besides the D&D student takes the central role in teaching/learning process. These couple of advantages accommodate diversity through universal design also they reinforce the self confidence of the D&D students.

4- As per the previous item and the feedback of the whole questionnaire, we can prove that D&D students can successfully compensate the auditory loss by visual output with the effective multimedia technique so we can say that : The system supports D&D students via effective visual output (sign language ,lip movement and finger spelling) of multimedia technique in overcoming learning disability.

Bibliography

- [1] Al- Bayati,, Maha & Hussein , Karim Q : Generic Software of e-Exam Package for Hearing Impaired Persons (Mathematics as Case Study) , a paper has been presented in the 2nd conference on planning & development of education & scientific research in the Arab states, 24-27Feb2008, King Fahd University of Petroleum & Minerals. Daharan ,Saudi Arabia.
- [2] AL- Bayati, Maha & Hussein ,Karim Q : Evaluating System for e-Learning Modules for Hearing Impaired Students (Technical Criteria in Review) , a paper has been presented in IEEE CONFERENCE ON AI TOOLS IN ENGINEERING,Thursday 6 March to Saturday 8 March 2008 ,Pune - Inida
- [3] Curran, Chris: Strategies for e-Learning in Universities,
Research & Occasional Paper Series: CSHE.7.04 Year 2004
University Of California, Berkeley
<http://ishi.lib.berkeley.edu/cshe/>
<http://repositories.cdlib.org/cshe/CSHE-7-04>
- [4] Hussein, Karim . Q : Development of an Evaluation Model for Instructional Computer Programs According to Technical Criteria , Arabic Conference of Technical Education , Higher Vocational Center for Computer technology , Tripoli , Libya 26-28th FEB2000.
- [5] Hussein, Karim Q : Theory of Teaching / Learning Process for Hearing Impaired Persons via e-Learning (applied theory) , Paper has been presented in IMCL2008 Conference , Princess Sumia University. Amman – Jordan , 16-18 April 2008.
- [6] Hussein,Karim Q & Prof.Athani ,V : Development of Instructional Computer Model for Designing e-Learning Modules for Hearing Impaired Persons (Technical Approach) , Paper has been presented in IMCL2008 Conference , Princess Sumia University . Amman – Jordan , 16-18 April 2008.
- [7] Hussein , Karim Q & Abo-Darwish, .Muna : Evaluating an Online e-Dictionary for Hearing Impaired Persons Through Case Study (effective role of speech visualization multimedia), a paper has been accepted in the 2nd conference of e-learning Bahrain University , 28-30April 2008
- [8] Felzer, Laura : Research on How Signing Helps Hearing Children Learn to Read , <http://littlesigners.com/article11.html>
- [9] Ferrett , Lauren Jade : Authoring Tools , Authorware , What are e-Learning Tools? Institute for Interactive Technologies , BloomsburgUniversity of Pennsylvania, USA.
<http://iiit.bloomu.edu/spring2006-eBook-files/chapter4.htm>
- [10] Jerke, Noel. The Complete Reference, Visual Basic 6, Tata McGraw-Hill publishing company limited, New Delhi 2000.
- [11] Kaplan, Harriet & Mahshie, James & Moseley, Mary & Singer, Beth & Winston, Elizabeth: Design of Effective Media Materials and Technology for Deaf and Hard – of – Hearing Students.
This document was prepared by National Center to Improve the Tools of Education, U.S. efface of Special Education Programs.
<http://idea.uoregon.edu/~ncite/documents/techrep/tech01.html>
- [12] Keller, Ed : Strategies for Teaching Students with Hearing Impairment, February 2004.
<http://www.as.wuv.edu/~scidis/hearing.html>
- [13] Patil, Vasant : The Story of Man, Standard Three : Maharashtra state Bureau of Textbooks production and curriculum Research, Puna. 1998.
- [14] Noel , Jerke : The Complete Reference : Visual Basic 6: C-DAC-Tata McGraw-Hill series , 1999
- [15] Sanchez , Guillermo : Web-Based Software to Generate and Manage Online Tests and Exams.
http://www.ircnet.lu/matching/completerec.cfm?BBS_ID=15651&org=106&back=true