Interactive E-book Development Using FOSS

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Abstract— **Interactive E-book plays an important role in imparting education. Multimedia integrated interactive E-book[1] helps the basic education system students to understand the concept and the fundamentals better. Availability of free and open software further made the process of e-book creation easier, faster and cost effective. This paper explore the possibility of creation of e-book using free and open software and utilization of the outcome in Oman primary education system.**

Index Terms— **Multimedia, FOSS (Free and Open Source Software), Unified Modeling, Livecode.**

I. INTRODUCTION

Oman like other contemporary societies seeking to develop education in order to provide all the basic educational needs of students and provide them with information and knowledge. Within the education development projects, basic education is initiated as a system of education in Oman. The span of first 10 years of primary education include episodes, the first episode of the first grade to the fourth, and the second episode from the fifth to the tenth grade.

Zia Al-elm School one of the first episodes in basic education school, used the traditional manner of education in terms of conservation and memorization. Designing an interactive e-book as a knowledge resource lead to new ways, to provide the curriculum content and insert the technology in education in order to motivate students to use different types of study materials. The attempt also facilitated increase the flexibility of giving information for students.

Zia Al-elm School for basic education from Grades (1-4). It is modern school that was open in 2015/2016.It is located in the state of AL-Musanah, in AL-Mldh area. The number of classes in Zia Al-elm School are 22, which consists of 6 sections of the grade one, 6 sections of the grade two, 5 sections of the grade three and 5 sections of grade four. In addition, the School includes individual

skills halls like (arts, music, life skills, and multi-purpose hall). The Building has a learning resource center equipped with all technologies. The planned interface will focus on the basic subject which is Arabic, Islamic, English, Math and Science because these subjects is more focused in theoretical aspects. Through the interactive knowledge bank in the form of e-book, students will be able to understand the subjects easier, learn more flexible and enjoy learning at the same time[2]. In addition, it will reduce the effort of the teacher during the lesson explanations.

II. SYSTEM STUDY

Present system is transforming the traditional manner of education in schools, which rely on memorization and conservation to technological education, In new system, the curriculum is animated to ensure the student to see and hear and try at one topic at a time. This helps the student to understand better and involve while learning. In order to cater the need of education resource as an e-book, Interactive e-book design was explored using FOSS (free and open source software) using Livecode. The interactive E-book will include few animation lessons for the Math subject, educational videos also activities for students to find out if they understand the lesson. In addition to that students also will have fun with education through educational games. The interface is easy and portable between different Computers device, the teacher will be able to view the application through the visual displays.

In order to increase the students' interaction in the classroom to the Math subject, E-book can be replace with the existing traditional books because The E-book will change the methods of education by adding electronic presentations based on multimedia[3]. The interface has to be available every ware and in anytime, Moreover it easy to use.

III. PROPOSED SYSTEM

The proposed system is about converting the traditional education at *Zia Al-elm* School to technology enabled education by using various multimedia programs. E-book will contain animated lessons, each lesson will contain video tutorial. Moreover, the teacher will provide special activities for students related to each lesson. For flexible delivery of information and the introduction of fun with education, the interface will also contain educational games. Hence the objective of the design is

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• Design and develop an interactive knowledge bank using all skills in the multimedia field.
• Achieving the higher level of experience, knowledge and skills.

• Expansion using open sourcing to get a powerful new software.

• Identify the educational needs of students
.
• Increase communication with the faculty and outsource other people from outside the college.

IV.   DATA ANALYSIS

Questionnaire as a tool used for the purpose of gathering information from users, contain a sequence of liquefaction designed for the analysis of responses and counting. During the time of system study, Online questionnaire was distributed was targeting 14 teachers, to get their opinion about the proposed system.. The survey results are analyzed and showcased in below in figures.

Technology introduction in education will help the student to accomplish their academic task have been identified by the following questions and observed that all the participant have agreed that the technology helps the students as shown below figure1.
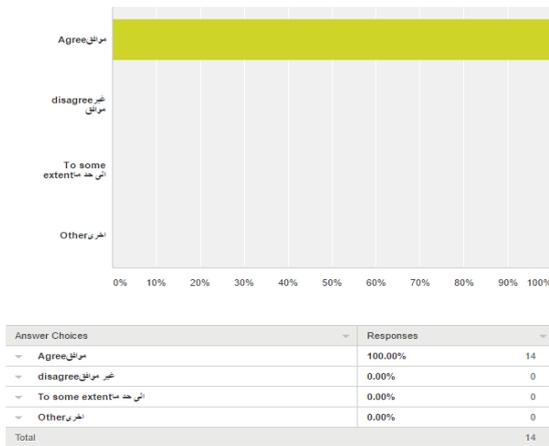

Answer Choices		Responses	
▾	Agree موافق	100.00%	14
▾	disagree غير موافق	0.00%	0
▾	To some extent الى حد ما	0.00%	0
▾	Other اخرى	0.00%	0
Total			14

Figure 1 – Opinion on Technology in Education

Opinion on changing education system and comprehensive benefits have been analyzed as shown below figure 2.

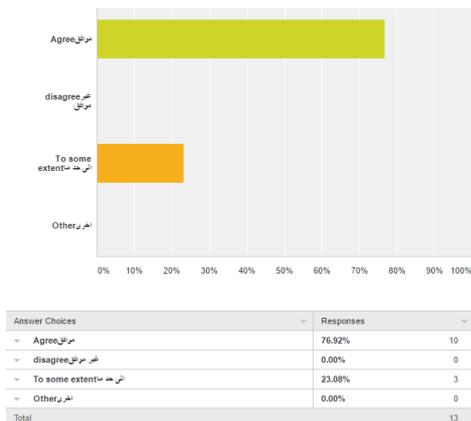| Answer Choices		Responses	
▾	Agree موافق	76.92%	10
▾	disagree غير موافق	0.00%	0
▾	To some extent الى حد ما	23.08%	3
▾	Other اخرى	0.00%	0
Total			13
.
Figure 2 – Opinion on Technology in Education

Approximately 77% teachers agreed that change in education system will benefit the students.
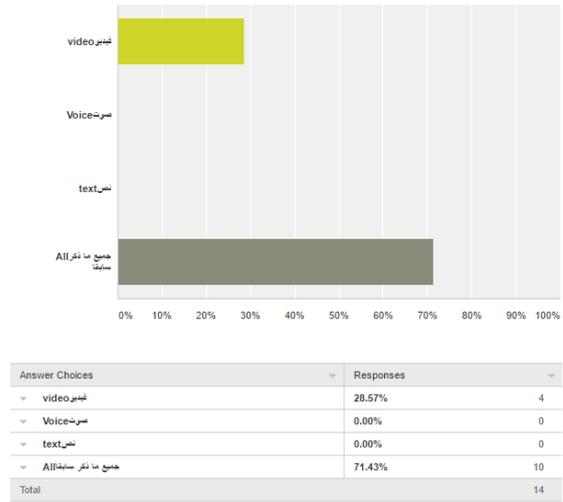Further opinion on e-book contents have been captured through questionnaire as shown in below figure 3.

Answer Choices		Responses	
▾	video فيديو	28.57%	4
▾	Voice صوت	0.00%	0
▾	text نص	0.00%	0
▾	All جميع ما ذكر سابقا	71.43%	10
Total			14

Figure 3 – Opinion on Contents

Most of the respondents agreed that the contents must include all medias including audio, video, text and animation.

V.   SYSTEM DESIGN

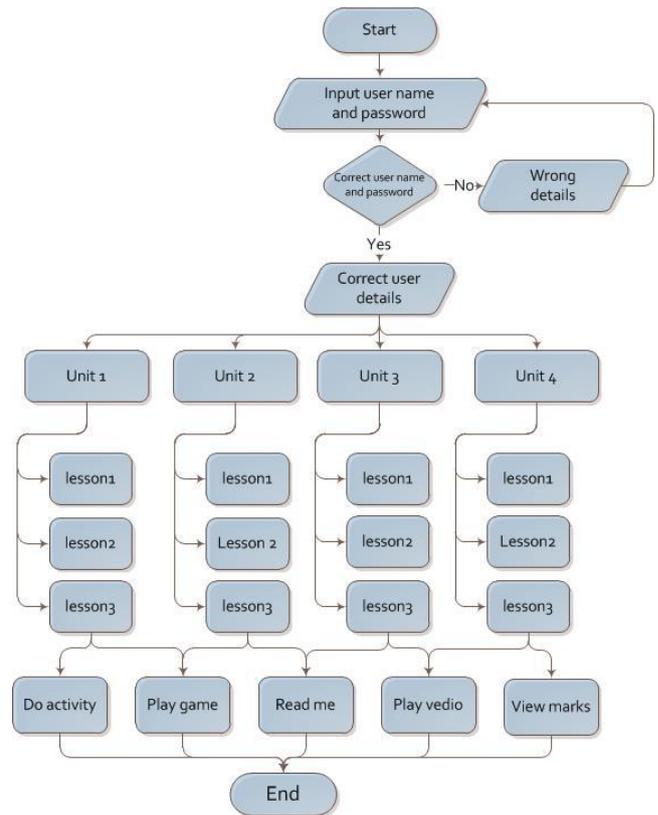Flow and the initial design of the entire system is shown below in Figure 4.

Figure 4 – System Block diagram

The interface helps the user to navigate through various contents of the e-book. User interaction with the system is shown below in Figure 5.
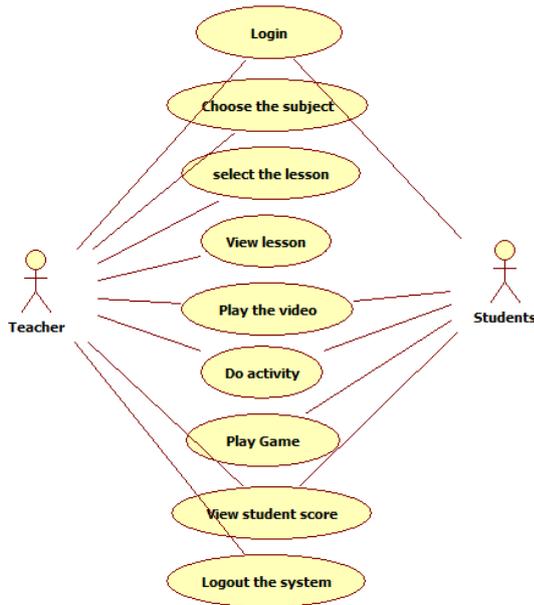

, **Figure 5 – UML diagram**

User interaction with the system have been described using Unified Modeling Diagrams.

Sequence of activities for student teacher interactions are then described as shown in Figure 6.
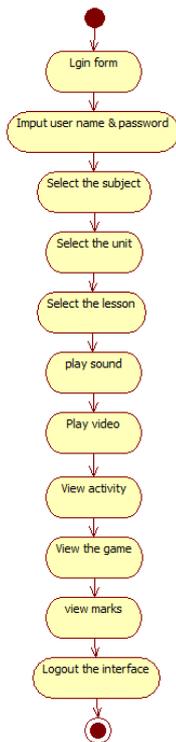

Figure 6 – Activity Diagram for teachers

These sequence of student – teacher activities with in the systems have been defined using activity diagram during the time of system design.

Once prototypes are finished, the final system designed beginning with creation of an authentication screen shown below in figure 7.

Figure 7– Authentication Screen

Authentication Screen helps user to login with username and password , hence greater control over the content accessibility.

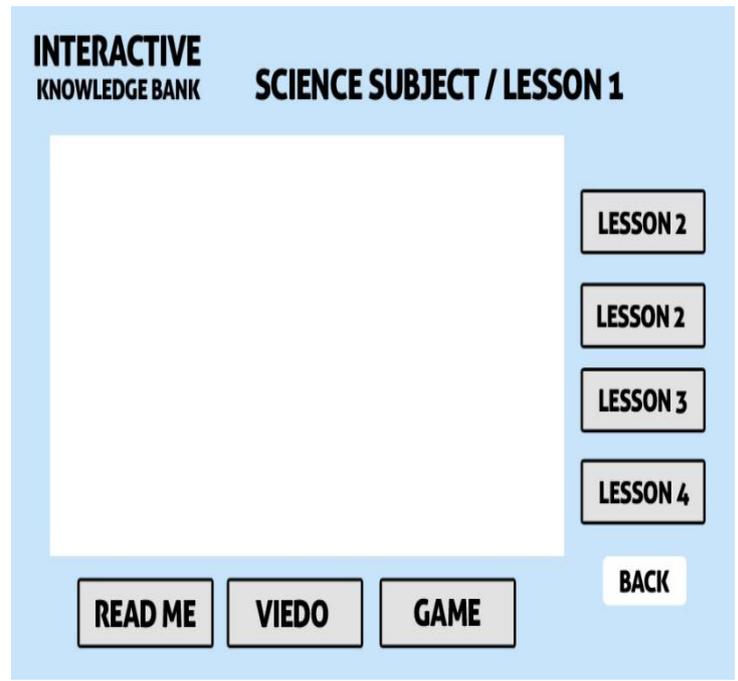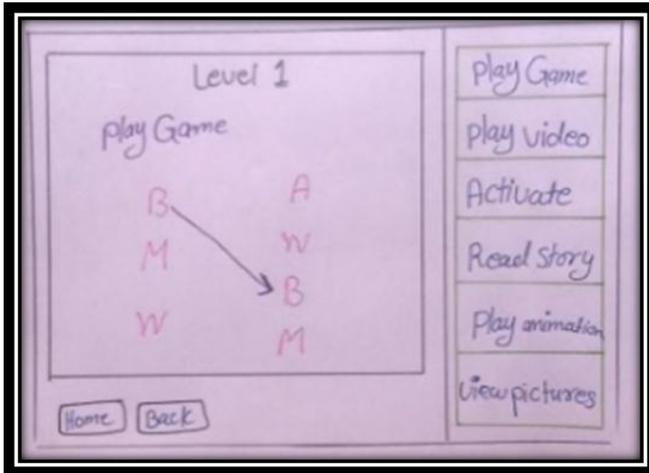The user interface further guide the user to go through the selective contents as shown in figure 8.

Figure 8– Content Screen

Developed e-book will have user interfaces, which will help the user to select the contents as per the choices.

VI. System ENHANCEMENT

Designed system can be enhanced incorporating various games as activities as shown in figure 9.

Figure 9– Activity Screen

These activities helps the students to enhance their analytical skills. Further FOSS like Livecode have greater flexibility and easy coding approaches for developing educational games.

VII. CONCLUSION

The system design attempted transforming the traditional method of education in Zia Al-elm schools to teach technology using interactive e-book approaches. The system especially targeting the sciences subject, because in science subjects, one need to teach experiments and watch the material contents simultaneously. This will help students to understand the subjects better. The designed application will provide interactive E-lessons with the sounds and effects. In addition to this, educational videos and integrated multimedia components for each lesson will add the value additions. Further enhancement of the contents by incorporating games as activities provide students analytical skills. Using FOSS for development of interactive e-book and educational games ensures to expand the contents in most cost effective manners.

VIII. REFERENCES

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