Design of online material for teaching Geography: Case study in secondary school

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Abstract

The current study seeks to introduce a new pedagogical design for teaching Geography in secondary schools utilizing online material. It aims to create a rich interactive environment in pre-university education. This research is concerned with the design of online materials as a prototype for two units of 10th grade curriculum to create an educational experience that will make the process of acquiring knowledge effective and attractive to students. It reports the findings of a survey carried out by the research team. The results show the effectiveness of teaching using the developed material. The overall results indicated that students and teachers have interest in learning space technology and its applications. The study shows also the importance of designing curriculum and teaching strategies, Extracurricular activities, and practicing guidelines.
Keywords: teaching Geography, Space Technology, online material.

1. Introduction

Many efforts have been made to develop education and curricula in Egypt and to build basic scientific and mental skills that help the child to assimilate modern science such as distance sensing science and applications. These sciences have become an essential component of education curricula of the developed world. For that, there is great attention to design and development of courses that include those sciences to increase awareness of children, which contributes to the progress of society in response to the information age . In this research, there are some international attempts that have been monitored through published researches convey these experiences. The aim of this research is to design electronic learning media working on internet which helps to increase the students' absorption of these sciences, through the design of an electronic educational learning model for the geographical curriculum for the first grade in secondary year.

2. Methodology of research

2.1. The selection stage of the school curriculum: geographical curriculum for the first grade in secondary year was chosen

2.2. Scenario design and review:
The stages of scenario preparation are as follows:

First: Analysis of the educational curriculum

The basic information about the curriculum is collected and the content is then divided into modules then to lessons and subjects. the analysis and classification for first and second units were applied as illustrated in Figure 1.
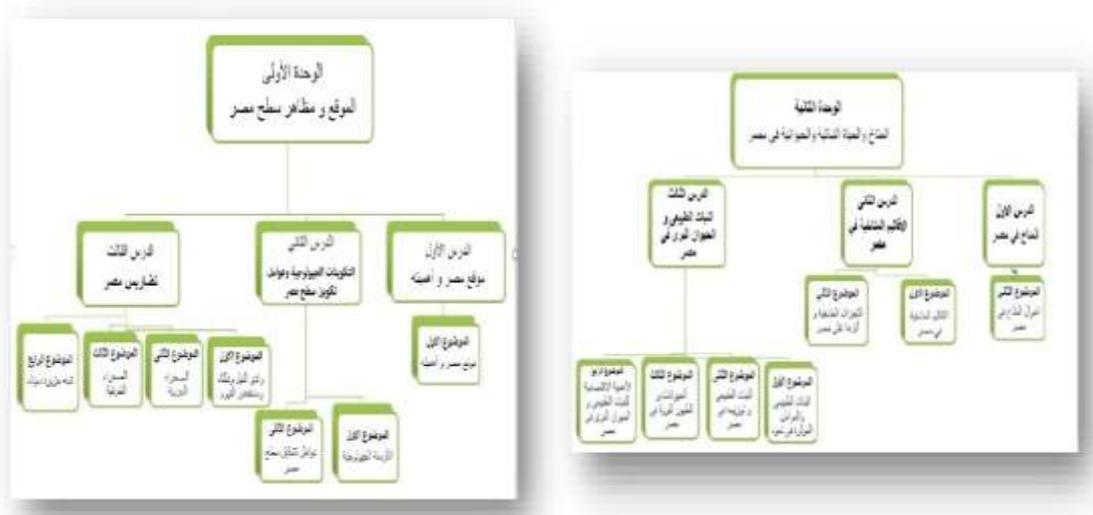

Figure 1. The analysis and classification for study units

Second: the scenario writing stage

This stage includes a conceptualization and planning of how the educational model will appear on the screen, as shown in Table 1.

Table 1. Model for the first unit scenario.

	Description of the screen	Audio commentary
1	The word appears on screen and then divided into two sections that each one makes its movement.	The concept of geography. Geography is a Greek word from two sections: the first one means the Earth (Geo) and the second means the description (Graphy).
2	The word sections disappear, and the image of the globe appears and then becomes magnified, until it reaches Egypt.	Thus, the old definition of geography is the science of the land description through travelers' observations that were recorded about the countries and territories during their visits.
3	The globe image disappears and the definition of geography becomes apparent with a kinetic effect.	The geography science is defined as: the science concerned to the study and analysis of natural and human phenomena on the surface of the earth with an explanation for the spatial relationship between them.

Third: Scenario Review Stage

The scenario was reviewed by the Curriculum Development Center of the Ministry of Education.

2.3. Design means of illustration:

The concept of beauty, utilitarianism and simplicity has been achieved in several stages.

First: the home page design (Figure 2).

Figure 2. the home page design

Second: Design the outer frame of the internal pages

The outer frame design of the first inner page is as a guide for the four units of decision (Figure 3). However, the outer frame of the internal pages is designed with the scientific content (Figure 4).

Figure 3. The first inner page design

Figure 4. the internal pages design

Third: Design the scientific content of the internal pages

The course's scientific content is designed based on the scenario that has been prepared and reviewed (Figure 5)
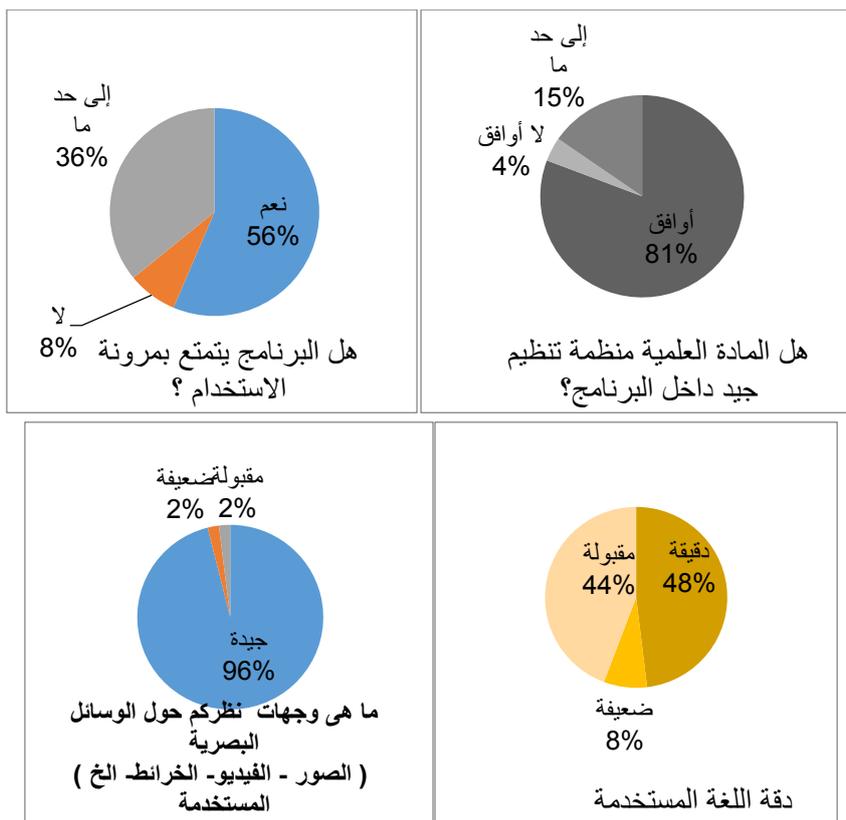

Figure 5. Part of the scenario and the method of application

3 Technologies used (programming)

Java Script, Action Script, HTML 5, CSS3 were used in coding. Moreover, Adobe Photoshop, Adobe Illustrator, Adobe Animate, Adobe Aftereffect, and Adobe Premiere were used in animated, dynamic, graphic design, interactive elements,

and audio in the developed model.

4 Results

An electronic learning model was produced for curriculum of the first-grade in secondary school (Unit 1 and 2). For evaluation and knowledge of the return on students, the model was presented to a sample of 39 students from two schools, Al-Raed School and Al-Sayeda Aisha School that affiliated to the Nozha Educational Administration in Cairo, from July 2016 to March 2017. This was done with the approval of the security department of Nozha Educational Administration. Furthermore, the opinions of students and teachers were surveyed through a questionnaire. Finally, these results were analyzed with graphs as the following:

إلى حد ما
36%

نعم
56%

لا   8%

هل البرنامج يتمتع بمرونة الاستخدام ؟

إلى حد ما
15%

لا أوافق
4%

أوافق
81%

هل المادة العلمية منظمة تنظيم جيد داخل البرنامج؟

مقبولة ضعيفة
2%   2%

جيدة
96%

ما هى وجهات نظركم حول الوسائل البصرية
(الصور ـ الفيديو ـ الخرائط ـ الخ)
المستخدمة

مقبولة
44%

دقيقة
48%

ضعيفة
8%

دقة اللغة المستخدمة

By analyzing the results of the graphs based on the overall views of the students, it is clear that the educational media achieve the following:

1. Most students prefer to use electronic media to create a more interactive environment.
2. The program has flexibility in use.
3. The scientific material is a good organization within the program.
4. The language used in dialogue and writing is clear and acceptable
5. The visual means used are very satisfactory to most students.
6. From the point of view of the teachers, the program presents the scientific material with good and interactive means for the students and clarifies additional information.

5 Recommendations

Based on the above results, the researchers recommend the following:

1. The use of the interactive educational environment in the pre-university education stages should be mainstreamed.
2. When designing educational media, the following should be considered:

- Good planning of educational media through the preparation of a well-controlled scenario and reviewed by specialists in the curriculum.
- The use of color elements, drawings and movement work on the success of educational media.
- It is preferable to use modern capabilities during the production of educational media.
- It is preferable to use simplicity in design.
- Programming processes must be implemented to ensure ease and flexibility in use.
- Audio commentary must be in sound and understandable language to students.