ELSEVIER

WCES-2010

Using multimedia objects in online learning environment

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Abstract

In parallel with the technologic developments in face to face learning environments, development of online learning is continuing rapidly. The use of online learning environments are increasing gradually and multimedia tools which are used in content are becoming more enriched. Text, audio, video and motions can be described as multimedia. In parallel with the gradual broadening of internet infrastructure in 21st century, text based lesson contents are replaced with contents which are audible, visual and having high interaction with the user. Thus learners can find the opportunity of reaching more effective and interesting lesson contents. In this research, multimedia tools which are used in online learning environments discussed and production process are discussed with the examples.

1. Introduction

Distance education, is a discipline which puts into practice of latest Technologies and uses different Technologies..When it is taken into account in this sense, distance education becomes prominent among disciplines which can use the resources of technology best. 21st century can be described as a century in which numerical Technologies became more prominent. Especially, computer and internet Technologies made learning environments gain more strength. Online learning; can be named as education and instruction activities which are done by distributing education materials via electronic tools such as text, sound ,motion video, graphics and animation via environments such as internet Technologies, TV, cell phone. With the help of the multimedia Technology used data Exchange and cooperation can be provided easily. Students are far from positioning and they can reach online courses synchronized or asynchronies by their own resources. In order to provide efficiency, effectiveness, attractive and sustainability in online environments the design of the content used and presentation of content are gained more importance. Before we discuss about the use of multimedia environments in online course contents let's examine the concept of multimedia environments. Multimedia environment is a concept about displaying text, image, graphic, drawing, sound, video and animations on a computer, storing files, forwarding from computer network and processing them numerically. When we say multimedia environment, having different information resources should

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be understood. If we explain it with an example; only sound or image is just an environment where information can be displayed, when we put all these together they can be named as multimedia environment. In this situation; having more than one text, image, graphic, drawing, sound, video and animation at the same time can be described as multimedia environment.

Multimedia environment uses the environments which symbolize the entire change of working style formed by computer-human interaction for transferring data and knowledge (Numanoğlu 1993). The aim of multimedia applications is to bunch together the environments we mentioned above and computer Technologies and applying them to learning environments. Different definitions are made for multimedia environments. In common definition, at least a few of the environments mentioned should be adapted to the same content.

Koumi separated multimedia environment in education into three major topics according to video techniques and learning functions (Koumi 2006),

1) Distinctive ways to assist Learning and Skills development
   - composite pictures, - split screen
   - animated diagrams exploring processes
   - visual metaphor/symbolism/analogy
   - modeling a process by a simplification
   - illustrating concepts with real examples
   - condensing time by editing real time
   - juxtaposition of contrasting situations
   - narrative strength
   - demonstration of skills by an expert
2) to provide experiences
3) Motivation and senses

Mayer developed Cognitive Model of Multimedia Learning for the educational environments which use multimedia environments (Mayer 2001).In keeping with the theories taken as models it focuses on the three important cognitive functions in data processing: selecting data, organizing data and integrating the data (Aldağ 2002). The multimedia technologies used in distance education are formed by radio, television, video, computer, videotape, tape, videoconference, videodisc, telecommunication, interactive video, interactive television, cable television, digital television, fiber-optic interactive television, digital communication network, radio, fax, interactive graphics, hypermedia, teletext, satellite television, electronic classroom, electronic library, communication satellites, satellite and communication network conferences, interactive telecommunication systems, internet, local area networks, multimedia working stations, computer, modem and electronic communication (e-mail), ISDN and CD. While we are developing the instructional design of a distance education project, we need to decide on which of the environments will make a contribution to the content. Our learning is primarily shaped by two memory components: working and long-term memory, as shown in Figure 1. Working memory, as the name implies, is the active member of the pair. It is in working memory that ideas are generated and learning takes place. However, working memory has a very limited capacity. In order to place the learning in long term memory, visual contents which are encouraging the learning should be given to a place Complicated visuals should be explaining by doubling. There should be frequent feedback and interaction between learner and the content (Clark 2007).

2. Multimedia Tools

As we consider the learning style we mentioned above, developing media animations with enriched designs is an important object in online systems. Fluent animations should be prepared for the learner who is following the content via internet. We must refer to some environment tools and their features.
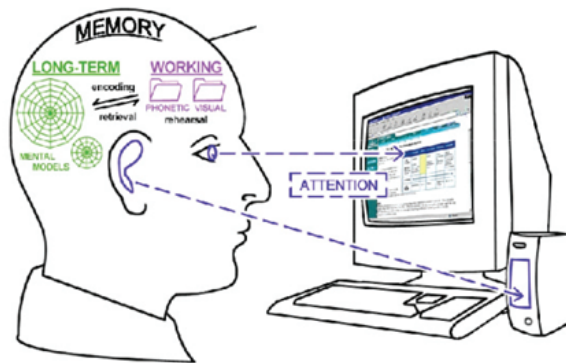
Figure 1. Effective eLearning supports critical psychological learning processes.

Text: It is commonly used environment for presenting the content to the user. Today, texts with animation or a link can be also given.

Sound: The size of the data is gained importance in presenting sound in online environments. In order to follow the content continuously by the learner, the content should be uploaded fast to the internet browser. For this the sound must be compressed. In Figure 2, you can see a window about the compression process of a sound file. Bite rate and frequency of the sound are adjusted. These settings affect the size of the sound file. The sound file saved should be offered together with the content in commonly used audio formats such as mp3, wma and wav. Apart from these formats the formats offered by sound converter can also be found.
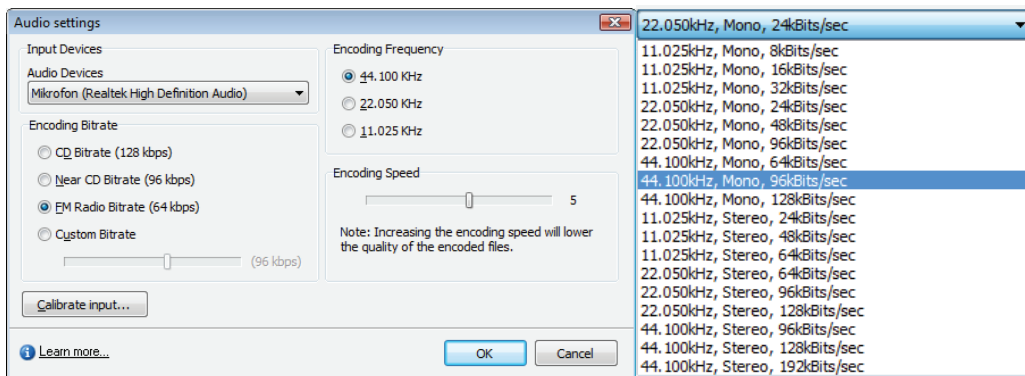

Figure 2. Audio compression formats and samples

Image: Image is an important object for describing and visualizing the content. Not only Stabilized or dynamic also animated images can be used. Because of the fact that small file size usually visuals with gif, jpeg, png and bmp extensions are used.
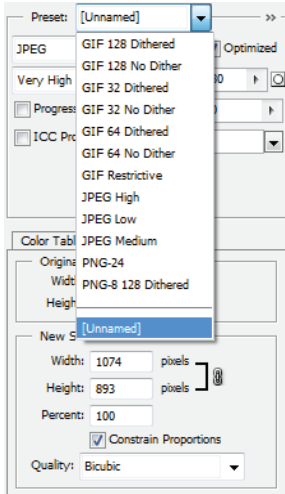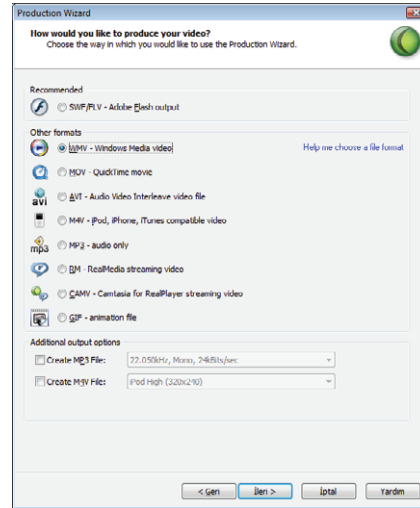
Figure 3. Images formats (Adobe Photoshop)

Figure 4. Video compression format (Camtasia Studio)

Video: The compression size of the video is very important for use of video as one of the multimedia environment object in online course contents. Today videos can be reached by users in avi, mpg, wmv, and mov formats. In online systems, continuous videos are started being commonly used due to internet access quality of the user. If the sizes of the videos are big, video streaming is preferred. This processing is the this operation is defined as processing the downloading data before the action is totally completed in the real time stated data flow system. It provides end user the possibility to watch the video continuously without any delay.

Figure 5. Multimedia samples

Animation: Adobe (Macromedia) applications are preferred more by the design developers for animation developing. Apart from that, there is software for developing 3D animations as well. The mostly preferred animation format in online course contents is animations which are produced by Adobe Flash software with .swf extension.

3. Conclusion and Recommendation

In order to make the content offered in online learning environments more attractive and efficient using multimedia objects in design is cared. For enhancing the permanency of the learning together with the text, sound, Picture, moving pictures, video or interactive animations, simulations can be used. In multimedia environments'

content design objects such as drag and drop animations, map, live content presentations, audio-visual chat tool can be used. The number of software for producing and developing objects in online environment is increasing day by day. One of the most important reasons of this is continues growth of bandwidth and the increase of the number of Access channels to the online courses. Due to an increase in the number of the mobile learning environments contents began being more enriched and diversity of multimedia environment objects. Multimedia environments started being offered in an embedded structure. In Figure 5, picture, text, animation and video is offered on same screen to the learner just as shown in Picture and attractiveness of the content is increasing. The diversity of multimedia environments should be increased in content designs and it should be selected very carefully.

In countries with increasing population, the need for education and employment is increasing in parallel with that. This increasing demand causes the birth of different education opportunities. In this sense, both on the side of the one who gets the education and on the side of the one who gives the education learning environments where the opportunities of latest technology is used gained importance. In order to supply the demand education institutions are in the effort of providing these education materials by online learning. These courses can be carried out via synchronized or asynchronies lessons. In these environments, education is carried out via courses prepared according to the needs of the target group. These courses require the design of different learning content with different computer programs. In this way, the use of multimedia objects in courses gains importance.

References

Alkan, M., Genç, Ö. & Tekedere, H. (2003). *Uzaktan Eğitimde Çoklu Ortam Teknolojilerinin Kullanımı ve Etkileşimli Çoklu Ortam Uygulamaları ile Eğitimde Kalite Arttırımı*. EMO Dergi.

Numanoğlu, M. (1993). *Eğitimde Yeni Teknolojiler ve Çoklu Ortam*. Ankara Üniversitesi Eğitim Bilimleri Fakültesi Dergisi 26/1

Mayer, R.E. (2001). *Multimedia Learning*, Cambridge University Press, 4-5.

Kaumi, L. (2006). *Designing Video and Multimedia for Open and Flexible Learning*. U.S.A.:Routledge Publishing Inc.

Clark, R. (2007). *Leveraging Multimedia for Learning*, Adobe System Incorporated. U.S.A.

The Learning Federation. (2009). Impact on the Multimedia and Elearning Industry of the SustainableNational Digital Curriculum Resource Supply for Schools Agreement Australian