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The Effectiveness of Multimedia Learning Tools in Education

Hilal Almara'beh, Ehab F. Amer, Amjad Sulieman

King Saud Bin Abdulaziz University for Health Sciences, College of Sciences and Health Profession,
Riyadh, Kingdom of Saudi Arabia

Abstract: Throughout the 1980s and 1990s, the concept of multimedia took on a new meaning and plays a good tool in educational technology. Furthermore the satellite, computers, audio, and video converged to create new media with enormous potential combined with the advances in hardware and software, these technologies were able to provide enhanced learning facility and with attention to the specific needs of individual users. Multimedia technology empowers the educational process by means of increased interaction between teachers, students, and courseware also innovative ways to make learning more dynamic, longer lasting, and more applicable to the world outside the classroom.

Keywords: Multimedia, E-learning, Educational Technology, Multimedia Courseware, Multimedia Classroom.

I. INTRODUCTION

A primary application of the interactive multimedia for instruction is in an instructional situation where the learner is given control so that maybe reviewed the material at their own space and in keeping with their own individual interests, needs, and cognitive processes. The basic objective of interactive multimedia material is not so much to replace the teacher so to change the teacher's role entirely. As such, multimedia must be extremely well designed and sophisticated enough to mimic the best teacher, by combining in its design the various elements of the cognitive processes and the best quality of the technology. With today's multimedia courseware, once a program has been designed and built in with the appropriate response, it should be flexible and permit change and alteration. Although multimedia as a tool cannot replace hands-on learning, it can enhance and strengthen the impact of activities in the field and in the science classroom. We can use new information tools, such as podcasts, blogs, and streaming video and audio, to engage our students and effectively demonstrate science concepts as well as to reinforce media literacy technologies. We can also engage students with digital media tools, such as photo-sharing, video-publishing and map-making programs, to give them opportunities to demonstrate their mastery of a concept and simultaneously reinforce their literacy skills by having them create their own content. Today, almost every university claims to have a strategy to utilize the opportunities provided by the internet or digital media in order to improve and advance traditional education. Together with the advent of the World Wide Web in the mid-1990s, the term e-learning was coined and created hype. Some people predicated dramatic changes in the educational environment or the end of traditional education in general. It seems that the question how multimedia technology can really make learning more exploratory and enjoyable has still not been answered [1]. In this paper we presented a study of multimedia and educational technology in (Section 2), the need of making multimedia courseware in (Section 3), use of multimedia in an educational setting (Section 4), multimedia in your classroom in (Section 5), also we provided some multimedia educational programs in (Section 6), finally conclusion in (Section 7).

II. MULTIMEDIA AND EDUCATIONAL TECHNOLOGY

2.1 What is Multimedia?

Multimedia is a term frequently heard and discussed among educational technologists today. Unless clearly defined, the term can alternately mean "a provident mix of various mass media such as text, audio and video" or it may mean the development of computer-based hardware and software packages produced on a mass scale and yet individualize use and learning.

2.2 Educational Technology

Educational technology is the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources [2]. It is most simply and contentedly defined as an assortment of tools that might prove helpful in student centered learning. It advocates the teacher becoming "Guide on the Side" rather than "Sage on the Stage"[3]. Educational technology also called 'Learning Technology', mainly comprise of the use of technology in the process of teaching and learning. Here the item technology does not only include the use of latest tools and techniques like laptops, interactive whiteboards, and smart phones; internet, Wi-Fi, and YouTube etc., although they are massively preferred by today's learners for their learning potential, but also encompasses efficient and enhanced learning management systems, schema of information dissemination, effective teaching and management of student masses, feedback mechanisms and performance evaluation methodologies etc.[4].

III. THE NEED OF MAKING MULTIMEDIA COURSEWARE

Besides being a powerful tool for making presentations, multimedia offers unique advantages in the field of education, also enables us to provide a way by which learners can experience their subject in vicarious manner. The key to provide this experience is having simultaneous graphics, video and audio, rather than in a sequential manner. Technology does not necessarily drive education. That role belongs to the learning needs of students. With multimedia, the process of learning can become more goals oriented, more participator, more flexible in time and space, unaffected by distance and tailored to individual learning style, and increase collaboration between teachers and students. With multimedia, the communication of the information can be done in more effective manner and it can be an effective instructional medium for delivering educational information because it enables the teacher to present the information in various media. Figure 1 is shown the marriage of content and multimedia technology results in interactive multimedia materials which can be delivered to the students in teacher-centered, student-centered, or hybrid teaching and learning modes.

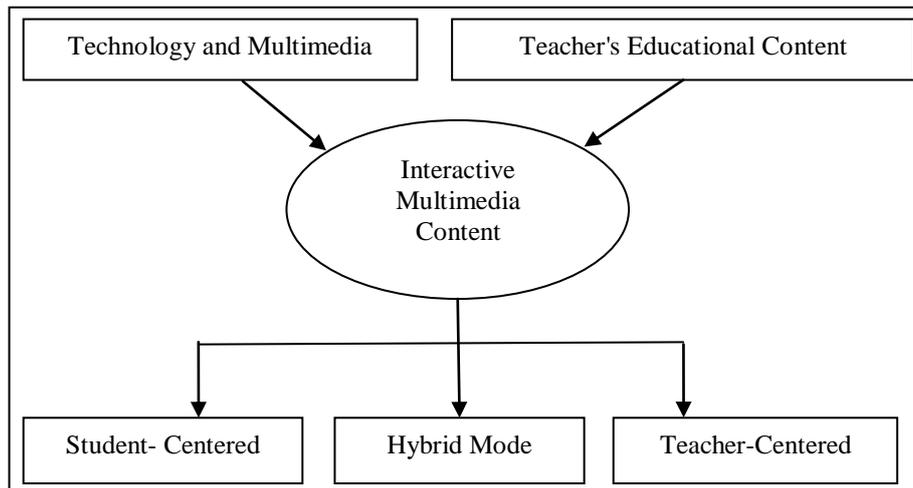


Fig.1 using multimedia to represent content and delivering via various methods

In the teacher-centered mode, the teacher is the one in control of the information that is received by the students and is responsible for how much information is being disseminated to them. The teacher-centered methods include presentations and demonstrations to process the information. Students are also able to retain and recall the information as well as obtain mastery in the subject matter with drills and practices, and tutorials, which are highly interactive. The multimedia courseware can also be packaged on the CD_ROM and delivered in a networked classroom leading to a teacher-centered mode where the courseware is opened on their computers and the students follow the teacher's lecture on their computers.

In the student-centered method, the students construct their own knowledge and bring authentic experiences into the learning process with the teacher as the facilitator. The multimedia courseware content can also be packaged as a web file and delivered on the internet in a web browser can be result in online courses where the students access the courseware from a browser on their computers. The students are then free to engage in learning on their own time and space, and consequently, the learning mode is student-centered. This multimedia material can be used to foster team-processing and active learning as with collaborative and cooperative method. This encourages higher-level learning, increases comprehension and retention rates, and focuses on the total development of the student in self-accessed and self-directed learning.

In the hybrid mode, the teacher has the flexibility to incorporate the two teaching and learning approaches whenever they deem them useful, to increase and enhance their students' learning processes. Here, the same multimedia courseware content can also be packaged and delivered over satellite and broadband technologies for distance learning. Meanwhile, the student learns the materials on their own time and space, and interacts with the teacher via video-conferencing in real-time [5].

IV. USE OF MULTIMEDIA IN AN EDUCATIONAL SETTING

Let's look at some examples of what is called "innovative use". Let's say that a student wants to write a paper on forest animals. Traditionally, the primary source for obtaining information would be the encyclopedia generally available in the library. With access to interactive multimedia, the student would collect various textual materials about the lion from sources on a CD-ROM. In addition, the student may be able to copy a diagram or the skeleton and muscular structure of the lion and the tiger to study what is common about the two creatures. With a multimedia approach, the student could then add film clips on these animals in their natural habitat and blend them into a report. Then by adding titles and credits, the student now has a new and original way of communicating his/her own individual perspective.

Similarly, a university professor might use a multimedia CD to prepare or update information or to teach so as to enliven and also add insight to his/her teaching, thereby improving the quality of the course. Medical procedures, first-aid training and instruction of paramedics or even surgeons are made both simple and interesting through the use of multimedia.

The doctor or paramedic can run through complete procedures on videodisc and analyze all the possible outcomes and can evaluate the possibilities before treatment of the real life patient starts.

V. MULTIMEDIA IN YOUR CLASSROOM

Technology continues to change the world around us. The academic world is no exception. Students and teachers everywhere are discovering exciting and innovative ways to make learning more dynamic, longer lasting, and more applicable to the world outside the classroom. Table 1 presents some multimedia software from Sony Creative Software, that you can incorporate video, music, and audio into your existing curriculum.

Table 1 Sony Creative Software in Your Classroom

Multimedia	Benefits
Group video report	Foster team building and provide hands-on experience with new technology. Assign three to five students to a team and let each team choose a topic about which they can make a short video.
Enhance the school website	Enhancing with streaming video content. For example, students could create a video tour of the school complete with host/narrator and subtitles.
Video language lessons	Can help speed learning.
Slideshow presentation	Can be used for almost any subject and are easy to create using Sony video editing software. You can use slideshows to enhance your lessons, or ask students to deliver reports in slideshow format.
Multimedia portfolios	Show off a student work in a fresh, new way. For example to create a slideshow featuring their best work.
Podcasting	Is a method of communication allowing anyone to create audio files and post them on the internet for others to download?
Convert lessons to MP3	Students can listen to material more than once

VI. MULTIMEDIA EDUCATIONAL PROGRAMS

Various multimedia educational programs have been designed, developed and implemented as a solution to observed problems in multiple disciplines. Various combinations of multimedia content and methodologies are being used as a try to solve the issues. The various organizations and institutions all over the world are dedicatedly working towards implementation of multimedia and exploring its multi-disciplinary utility. Table 2 presents a critical study of a few multimedia educational programs.

Table 2 Multimedia Educational Programs

Program	Benefit(s)	Multimedia Technology Used	Noticing
Heads Up (Health Educational and Discovering Science while unlocking potential)	To develop interesting in science and encourage students to enter academic pipeline to careers in health sciences	1) Video career stories of minority health scientists on DVD or taps. 2) Graphics and Animations during hands on activities. 3) Web based Resources. 4) Teacher resources following iterative review and feedback design process	The program presented in paper [7] results assures to reduce the achievement gap between white and non-Asian minority middle school students by representing life stories of minority scientists in a multimedia framework.
WIT (Williams Instructional Technology)	To develop high quality multimedia based projects to be used faculty in teaching	1) Print Publications to advertise WIT. 2) Presentation to share project experiences. 3) Daily messages on web to announce collection of project proposals. 4) Digital story telling workshop during training	The program presented in paper [8] has successfully proven the use of multimedia technology in training the interns, and facilitated the creation of projects that work in classroom teaching
TiM	To design, develop and to adapt computer games for visually impaired children	1) Tactile and sound interface for playing through interactive stories. 2) Use of concept keyboard. 3) Use of Joysticks to control sound interface	The project presented in paper [9] advocate the use of multimedia computer games for visually impaired children as an aid for their psychomotor development and enhanced adaptability to human computer interface.

KAD (Kino-Ani-Drama and Animation Therapy)	To reduce stress related problems caused by excessive use of internet, mass-media and video games	1) Off-line Kino-Ani-Drama therapy including dance and drama therapy, music therapy and painting therapy. 2) Online animation therapy including 2D, 3D animation, Hypertext, virtual reality.	The program presented in paper [10] showed therapeutic results to the mind and body of stressed out net-generation caused by negative effect of compulsive use of media by constructively engaging them in media production like video, audio, animation, etc.
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VII. CONCLUSION

According to the paper, the changing role of education is currently being reinforced with the integration multimedia technology and this has led a new paradigm in education and the evolution of new concepts in content development and a number of innovative methods in which information can be communicated to the learner. In conjunction with the study of usefulness multimedia in different educational scenarios, the important point for future research is that the time to come will surely promise the availability of multimedia technology to one and all, but its usage should be limited to and in consideration with its pedagogical strengths, also given high importance of multimedia from different fields of researchers backgrounds, divers view-points, and varying procedural methods. Hence the multimedia community seems to be the perfect platform for bringing all those researchers and educators with different backgrounds together in order to help improve multimedia based education and therefore teaching and learning in general.

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