

## **Role of Multimedia in Education**

Sukhendu Mukherjee

Tiny Planet Inc, 5551 Orangethorpe Ave, La Palma, CA 90623, USA; sukhendu.mukherjee@tinyplanetinc.com (S.M.).

---

**Abstract:** This can present a challenge to educators wishing to engage students in the classroom while still providing required content in order to enhance learning outcomes. In Teaching and learning communication skills, we have a lot to choose from the world of technology: TV, CD Rom, Computers, the Internet, Electronic Dictionary, Email, Blogs and Audio Cassettes, Power Point, Videos, DVD's or VCD's. The last two decades have witnessed a revolution due to onset of technology, and has changed the dynamics of educational institutes, and has also influenced the educational system and the way people interact and work in the society. This rapid rising and development of information technology has offered a better pattern to explore the new teaching model. Using multimedia to create a context to teach communication skill has its unique advantages. As a result technology plays a very important role in teaching communication skill.

---

**Keywords:** *Multimedia, Education, Media, Image, Graphics.*

### **1. Introduction**

The world in which we live is changing rapidly and the field of education is experiencing these changes in particular as it applies to Media Services. The old days of an educational institution having an isolated audio-visual department are long gone! The growth in use of multimedia within the education sector has accelerated in recent years, and looks set for continued expansion in the future. Teachers primarily require access to learning resources, which can support concept development by learners in a variety of ways to meet individual learning needs. The development of multimedia technologies for learning offers new ways in which learning can take place in schools and the home. Enabling teachers to have access to multimedia learning resources, which support constructive concept development, allows the teacher to focus more on being a facilitator of learning while working with individual students. Extending the use of multimedia learning resources to the home represents an educational opportunity with the potential to improve student learning.

### **2. Research Method**

Educational media refers to channels of communication that carry messages with an instructional purpose. They are usually utilized for the sole purpose of learning and teaching. Although personal definitions abound, generally it is accepted that multimedia is classified as any combination of text, graphics, sound, animation, and video delivered and controlled by the computer. Extending this definition, interactive multimedia is defined as non-linear multimedia, that is, any tool that gives control to the user rather than the computer. This shift of control allows for individually customized information flow. These applications centre on the user through menu-driven programs, hypermedia applications, process simulations, performance dependent programs, direct manipulation environments or combinations of these interactive techniques. In general, multimedia has been relatively successful because it draws upon more than one of the five human senses, utilizing the two fundamental senses vital for information reception – sight and sound. Due to motion and sound, it can also spark attention, interest and motivation in the process. However, multimedia alone is intriguing at best and does not require the user to be actively controlling or necessarily thinking about what is being presented.

Often one of the difficulties in presenting science or engineering content is that the concepts being portrayed are microscopic in detail. From biological cell structures to the structures of atoms, learner understanding of the content is often limited by the media that is being used to present it. Frequently science and engineering texts provide abstract, two dimensional drawings, which require interpretation by the reader. More often than not, spatial ability wanes and thus student understanding of such drawings, and the microscopic details they represent, is hindered. In most instances the Materials in Focus was the first exposure that students had with VR technology as well as interactive multimedia directly related to materials science. Due to this, the interface for Materials in Focus. CD-ROM was designed to provide interactive multimedia components that would enable students to better understand the minute details and interactions of materials on which the discipline focuses. The CD was also designed so that instructors could use the assets in lecture and demonstration sessions to

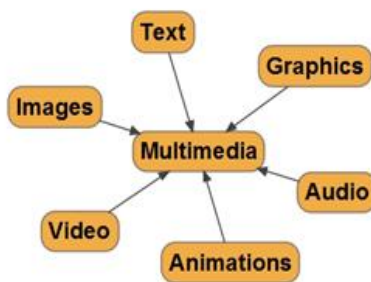
better engage students in active learning. Using VR technology, the CD-ROM provides the ability to navigate a variety of structures and elements. Rather than presenting linear video clips or static images, the CD provides interactive components that the student directly manipulates. With the acknowledgement that spatial ability is important, it is meaningful to identify the primary methods that have been used to increase the spatial abilities of engineering students and their understanding of engineering concepts. Much of the literature and research focuses on issues surrounding group and individual differences related to a number of dependent variables, such as gender, cultural background, and other environmental characteristics. At present, however, more and more studies are aimed at discovering appropriate technologies and apposite techniques that can be used with relative confidence. Researchers are beginning to examine the validity and reliability of CD-ROM and web-based technologies to communicate scientific and engineering content.

As the technology concurrently impacts engineering education, computer-based multimedia is also increasing in the larger context of education. Various cause and effect relationships are being studied as to the reason multimedia instruction is successful in this larger scope. Nevertheless, it is no surprise that increased efforts are being pursued in specific disciplines such as engineering education. Historically, while not having a primary focus within the engineering curriculum, researchers in engineering disciplines have nevertheless tested numerous methods in an attempt to teach and further spatial abilities of engineering students, each with varying levels of success.

Our eyes and ears, in conjunction with our brain, form a formidable system for transforming meaningless sense data into information. The old saying that "a picture is worth a thousand words" often understates the case especially with regard to moving images, as our eyes are highly adapted by evolution to detecting and interpreting movement.

For example, a photograph of Ganges in Varanasi, apart from being aesthetically pleasing, can contain a wealth of information relating to the culture, religion, geography, geology, climate, history, and economics of the area. Similarly, a recording of a politician's speech can allow us to discern significant semantic features not obvious in a written transcript.

**Elements of Multimedia:** Elements of Multimedia are Text, Images and graphics, Audio, Video, and Animation. Texts, images and graphics are three elements static (do not move) whereas the other three elements: audio, video and animations are moving objects or dynamic object within a multimedia application.



### 2.1. Text

Text is very important for communication in any medium. It involves the use of text types, sizes, colors and background colors. In a multimedia application, other media or screen can be linked through the use of text. This is what you call Hypertext. You can create text directly within an authoring application or import it from external text files. Examples of text are ASCII/Unicode, HTML, Postscript, PDF, Note and Word pad.

### 2.2. Images and Graphics

Graphics make the multimedia application attractive. They help to illustrate ideas through still pictures. There are two types of graphics used: bitmaps (paint graphics) and vector (draw graphics). Bitmaps images are real images that can be captured from devices such as cameras or scanners.

Vector graphics are drawn on the computer and only require a small amount of memory. There are different kinds of image formats like the Captured Image Format and the format when images are stored. The captured image Format is known by two main factors that is spatial resolution which is specified as pixels x pixels (225x 225) and color encoding, which is specified by bits per pixel. Both factors depend on hardware and software for input/output of images. The Stored Image Format is when we store an image; we are storing a two-dimensional array of values, in which each value represents the data associated with a pixel in the image. These types images can be edited with the help of few of the software like general drawing GIMP, and paint, adobe Photoshop, Photos cape etc. The PNG format was developed as a patent-free replacement for the GIF format. PNGs can use an alpha channel to define transparency in a graphic. Import PNG files into any of the Macromedia tools as an alternative to GIF files, especially if you need 24-bit graphics or graphics with transparency. Use this format in Web-native content only when delivering to newer browsers; some older browsers do not support the PNG format also display PNG graphics files. Most Web browsers can display GIF and JPEG graphics files. The two most popular graphic formats for online training and Web pages in general are GIFs and JPEGs. Both are bitmap files that are relatively small in size. The two formats compress images differently, each excelling at compressing different types of graphics.

### 2.3. Audio

Audio is the best way to attract attention. A multimedia application may require the use of speech, music and sound effects. These are called audio or the sound element. To catch the interest of the audience. Audio is effective for training and educational application. There are two types of audio analog and digital audio. Refers to the reproduction and transmission of sound stored in a digital format. The digitizing and storage of sound or music on a computer or compact disc.

### 2.4. Sound Wave Characteristics

Two main characteristic in sound waves are FREQUENCY and AMPLITUDE. Frequency in the number of cycles a sound wave creates in one second. A cycle is measured from one wave peak to another. The standard measurement for frequency is called HERTZ (Hz). Amplitude is the volume or loudness a particular sound makes. The louder the sound, the higher the amplitude will be. The unit of measure for loudness or volume is decibel (dB).

### 2.5. Audio Formats

MP3 audio (.mp3) ,Wav audio (.wav) , Sound (.snd), Real audio (.ra, rm), Audio File Format (.aiff) , MIDI (.mid) ,Windows Media Audio (.wma).

### 2.6. Video

Video is the technology of electronically capturing, recording, processing, storing, transmitting, and reconstructing a sequence of still images representing scenes in motion. Video is more towards photo realistic image sequence / live recording as in comparison to animation. Video makes use of all of the elements of multimedia, bringing your products and services alive, but at a high cost. Although video requires lots of bandwidth to download, it is very useful for conveying certain information. Using video in e-learning helps realistically demonstrate equipment and processes among other things.

For instance, an e-learning course in botany might show a video of a sprouting seed. A course about the features of an airplane might show a video of a crewmember properly closing and securing a door for takeoff. The intricate level of detail visible in video is also ideal for illustrating subtle, nonverbal information. For example, to teach sales skills you could use a video to demonstrate an interaction between a salesperson and a customer, then have the learners analyze the body language of the people involved in the transaction.

### 2.7. Video Formats

Video file format are Motion Pictures Expert Group (.mpg), QuickTime (.mov), Audio Video Interleaved (.avi), Windows Media Video (.wmv), Adobe Flash video (.flv). There are three standard digital video formats: Quick Time, Video for Windows, and MPEG. Video files tend to be large so they really aren't appropriate for delivery on modem connections. You may choose to include video in your e-learning course if you are delivering it over an intranet or to users with relatively high bandwidth connections. There are many open source video editing tool and open shot is one such popular tool.

### 2.8. Animation

Animation is a process of making a static image look like it is moving. In multimedia, digital animation is used. Digital animation can be categorized into two broad areas: 2D (2 Dimension) and 3D (3 Dimension) animations. 2D animation refers to creating movements in basic objects. These objects are put into various situations or positions and have movement on the screen. 3D animation refers to creating movements to three dimensional digital objects from photographs. Movements like spinning and flying across the screen are some samples of animations. Since animations usually involve graphics, they are highly dependent upon the size and file type of the graphics that are being animated.

### 2.9. Animation Formats

Animation file formats are .swf, .gif. There are many ways you can create animations. Author ware, Dreamweaver, Director and Flash can all create animations. An animation created within an authoring program is usually smaller and more efficient than an animation created in another tool and then imported in your authoring program. This is particularly true when an animation is based on shapes created with the software's drawing tools rather than with imported bitmaps. For example, Flash excels at creating vector graphics and animations. Although Flash can animate bitmap graphics, animations made predominately with vector graphics in Flash are considerably smaller than animations created with bitmap graphics.

## 3. Results and Analysis

Using educational multimedia in the classroom effectively and meaningfully demands a careful selection of materials. Multimedia products and online services should be selected according to the overall objectives of learning activities, learners' prior knowledge and experiences, curriculum, etc. It's a better chance to gain knowledge with graphical views. Allow students to function as designers, using tools or software for analyzing the words, accessing and interpreting information, organizing their personal knowledge. Student can easily represent their knowledge about any molecular structure of atom and molecular structure of DNA etc in graphical.

## 4. Conclusion

It is true that one of the ultimate goals of multimedia language teaching is to promote students' motivation and learning interest, which can be a practical way to get them involved in the language learning, Context creation of ELT should be based

on the openness and Accessibility of the teaching materials and information. Concerning the development of technology, we believe that in future, the use of multimedia English teaching will be further developed. The process of English communication learning will be more student-centered but less time-consuming.

Therefore, it promises that the teaching quality will be improved and students' applied English communication can be effectively cultivated, meaning that students' communicative competence will be further developed. In conclusion, we believe that this process can fully improve students' ideation and practical language skills, which is helpful and useful to ensure and fulfill an effective result of teaching and learning. Barring a few problem areas multimedia technology can be used effectively in classrooms of ELT with proper computer knowledge on the part of teachers, overcoming the finance problems in setting up the infrastructure and not allowing the teachers to become technophobes.

Technology is advancing rapidly and is beginning to provide educators with a wealth of potential tools. The future of education is in finding those technologies that enable active learning experiences for students.

### References

- [1] R. Albarino, "Goldstein's lightWorks at southhampton," *Variety*, vol. 213, p. 12, 1966.
- [2] T. Vaughan, *Multimedia: Making it work*. Berkeley: Osborne/McGraw-Hill, 1993.
- [3] R. David, "TEDx talks visual feasts of the mind: Matching how we teach to how we learn," 2013.