

CHAPTER – II

CONCEPTUAL FRAMEWORK

2.1 INTRODUCTION

The conceptual frame work enabled the researcher to be definite and specific about the research perspectives. The innovative approach enabled the researcher to conceptualise the variables involved in the study in order to set the investigation in the right perspective.

2.2 MULTIMEDIA

The term multimedia is often used in reference with the art or act of creativity especially using a personal computer. In other words ‘multi’ means ‘many’ and ‘media’ means a medium by which communication takes place or a medium where ideas are transferred. Therefore, it means many mediums working either together or independently. Multimedia is the field concerned with the computer-controlled integration of text, graphics, drawings, still and moving images (Video), animation, audio, and any other media where every type of information can be represented, stored, transmitted and processed digitally. As the name suggests, multimedia is a set of more than one media element used to produce a concrete and more structured way of communication. In other words, multimedia is simultaneous use of data from different sources. These sources in multimedia are known as media elements. With growing and very fast

changing information technology, Multimedia has become a crucial part of computer world. Its importance has been realised in almost all walks of life, may it be education, cinema, advertising, fashion and what not. Throughout the 1960s, 1970s and 1980s, computers have been restricted to dealing with two main types of data-words and numbers. But the cutting edge of information technology introduced faster system capable of handling graphics, audio, animation and video. And the entire world was taken aback by the power of multimedia.

It can be considered to be a combination of several mediums like:

- Text
- Pictures / Graphics
- Animation
- Video and Sound

A Multimedia System can be defined as a communications network, computer platform or a software tool is a multimedia system if it supports the interaction with atleast one of the types of the above-mentioned mediums. All these are used to present information to the user via the computer. The main feature of the application of any multimedia is its human interactivity. It is also considered as user-friendly and basically it caters to the commands dictated by the user. For instance, the user can be interactive with a particular programme by clicking on various icons and links, the programme subsequently reveals detailed information on that particular subject.

Computer and multimedia systems are among the most important means of training foreign languages. Any area of human life can be transformed, made simpler, more effective, more interesting and attractive by the application of computer technology. There are packages, namely an extensive collection of computer programmes that helps the students in mastering English language. The programmes are under the titles: “Student’s Card”, “Great Britain”, “Crime”, “Psychological Test”, “Sherlock Holmes”, “Reading Fast” and others. Some programmes are designed for different levels of students and consists of various rounds.

Some software have capabilities ranging from simple grammar control programmes to more sophisticated ones such as communicative computer delivery courses. People try to use computer not as a testing machine, but as a teaching machine for different activities: reading, writing, speaking and audio receiving. Computer is a mighty helper of a foreign language teacher. Technological progress in both hardware and software continues to expand the capabilities that computer has to offer. Special attention must be paid to multimedia system of computers. This is viewed as a new source to promote, enlarge and intensity English language learning. Multimedia system is becoming more effective and more motivating. From this point of view, one can utilise the capabilities of this device and by allowing to organise the real communication between learners in computers and learners in practice.

Multimedia is a single touch glance access to an instant choice of lines of enquiry and answers provided by words, figures, pictures and sound. Further touches on the screen made it almost possible to have a conversation with these friendly robots. The other facilities of interaction multimedia are

the utilisation of sound files, musical, animation and video. People are convinced that these pedagogical tools provide for teachers both structure and the flexibility necessary for meeting the needs of a particular group of students in English learning and teaching situation. The availability of multimedia technology enables the teachers of English language to create many interactive, communicative and cooperative activities. Placing the media in a perspective within the instructional process is an important role of the teacher and library professional. Multimedia can be used as reinforcement, to clarify or symbolise a concept. It creates a positive attitude in a person in what they are learning, in this way the learning process itself can be enhanced. The teaching and the learning can be made more interesting and there is more scope for interaction and the teaching session can be more interactive. The topic can be selected with care and the content can be well-organised. Here, the time needed for instruction can be reduced.

The components of a multimedia package are as follows:

i) Text:

It is one of the most popularly used mediums of appearance, in ninety-nine percent of the occasions text provides the core structure to the package. A major drawback of using text is that it is not user-friendly as compared to the other mediums. Also it normally has a lack luster performance when judged with its counterparts. It is for instance harder to read from a screen as it tires the eyes more than reading it in its print version. But now with the availability of text to speech software, this drawback is speedily disappearing.

Hypertext can also be provided. Hypertext in a way provides a choice to the user in reading or not reading the information in detail, attached to a particular word of text. Inclusion of textual information in multimedia is the basic step towards development of multimedia software. Text can be of any type, may be a word, a single line, or a paragraph. The textual data for multimedia can be developed using any text editor. However to give special effects, one needs graphics software which supports this kind of job. Even one can use any of the most popular word processing software to create textual data for inclusion in multimedia. The text can have different type, size, color and style to suit the professional requirement of the multimedia software.

ii) Pictures / Graphics:

Pictures enhance the overall look of a multimedia package. Pictures express more than the normal text can. Pictures can be created using the following ways namely by using a drawing tool like MS PAINT (from Microsoft Inc.), using digital scanners, or original photographs taken with the help of a web camera or its equivalent. The size of these images can be sometimes very large and the factors which determine these are: the size of the image in terms of pixels, resolution i.e. dots per inch (DPI), number of colours that the system monitor can display at one time. Colour depth is the amount of binary data, the computer reserves for describing each pixel. Another interesting element in multimedia is graphics. As a matter of fact, taking into consideration the human nature, a subject is more explained with some sort of pictorial / graphical representation, rather than as a large chunk

of text. This also helps to develop a clean multimedia screen, whereas the use of large amount of text in a screen makes it dull in presentation.

Unlike text, which uses a universal ASCII format (American Standard Code for Information Interchange), graphics does not have a single agreed format. They have different format to suit different requirement. Most commonly used format for graphics is BMP (Bit Map Pictures). The size of a graphics depends on the resolution it is using. A computer image uses pixel or dots on the screen to form itself. And these dots or pixel, when combined with a number of colours and the other aspects are called resolution. Resolution of an image or graphics is basically the pixel density and number of colours it uses. And the size of the image depends on its resolution. A standard VGA (Virtual Graphics Arrays) screen can display a screen resolution of $640 \times 480 = 307200$ pixel. And a Super VGA screen can display upto $1024 \times 768 = 786432$ pixel on the screen. While developing multimedia graphics one should always keep in mind the image resolution and number of colours to be used, as this has a direct relation with the image size. If the image size is bigger, it takes more time to load and also requires higher memory for processing and larger disk-space for storage. However, different graphics formats are available which take less space and are faster to load into the memory.

There are several graphic packages available to develop excellent images and also to compress them so that they take lesser disk-space but use higher resolution and more colours. Packages like Adobe Photoshop, Adobe Illustrator, Paint Shop Pro etc. are excellent graphic packages. There is Graphics gallery available in CDs (Compact Disk) with readymade images

to suit almost every requirement. These images can directly be incorporated into multimedia development.

iii) Animation:

Moving images have an overpowering effect on the human peripheral vision. Following are few points for its popularity:

a) Showing continuity in transitions:

Animation is a set of static state, related to each other with transition. When something has two or more states, then changes between states will be much easier for users to understand if the transitions are animated instead of being instantaneous. An animated transition allows the user to track the mapping between different subparts through the perceptual system instead of having to involve the cognitive system to deduce the mappings.

b) Indicating dimensionality in transitions:

Sometimes opposite animated transitions can be used to indicate movement back and forth along some navigational dimension. One example used in several user interfaces is the use of zooming to indicate that a new object is “grown” from a previous one (example, a detailed view or property list opened by clicking on an icon) or that an object is closed or minimised to a smaller representation. Zooming out from the small object to the enlargement is a navigational dimension and zooming in again as the enlargement is closed down is the opposite direction along that dimension.

c) Illustrating change over time

Since animation is a time-varying display, it provides a one-to-one mapping to phenomena that change over time. For example, deforestation of the rain forest can be illustrated by showing a map with an animation of the covered area changing over time.

d) Multiplexing the display

Animation can be used to show multiple information objects in the same space. A typical example is client-side image maps with explanations that pop up as the user moves the cursor over the various hypertext anchors.

e) Enriching graphical representations

Some types of information are easier to visualise with movement than with still pictures. Consider, for example, how to visualise the tool used to remove pixels in a graphic application.

f) Visualising three-dimensional structures

As one knows the computer screen is two-dimensional. Hence, users can never get a full understanding of a three-dimensional structure by a single illustration, no matter how well-designed. Animation can be used to emphasise the three-dimensional nature of objects and make it easier for users to visualise their spatial structure. The animation need not necessarily spin the object in a full circle; just slowly turning it back and forth a little will often be sufficient. The movement should be slow to allow the user to focus on the structure of the object.

One can also move three-dimensional objects, but often it is better if you determine in advance how best to animate a movement that provides optimal understanding of the object. This pre-determined animation can then, be activated by simply placing the cursor over the object. On the other hand, user-controlled movements requires the user to understand how to manipulate the object which is inherently difficult with a two-dimensional control device like the mouse used with most computers, to be honest, 3D is never going to make it big time in user interfaces until one gets a true 3D control device.

g) Attracting attention

Finally, there are a few cases where the ability of animation to dominate the user's visual awareness can be turned to an advantage in the interface. If the goal is to draw the user's attention to a single element out of several or to alert the user to updated information then, an animated headline will do the trick. Animated text should be drawn by a one-time animation (example, text sliding in from the right, growing from the first character, or smoothly becoming larger) and never by a continuous animation since moving text is more difficult to read than static text. The user should be drawn to the new text by the initial animation and then, left in peace to read the text without further distraction. One of the excellent softwares available to create animation is Animator Pro. This provides tools to create impressive animation for multimedia development.

iv) Video and Sound:

Sound is used to set the rhythm or a mood in a package. Speech gives an effect of a language like pronunciation for instance. Sound files in various sound file formats like the MP3 (Music Player 3) can be easily transmitted through the net. Voice over Internet Protocol (VOIP) is an upcoming field with a great future. Sound can be recorded into a mic or from any other medium like tape or cassette player onto the personal computer. Some of the factors effecting the size of sound files areas are, the method of storage used, whether in the format there is any kind of compression or resolution that is, bit rate, whether the sound is mono or stereo, the quality of sound as desired by the user. If pictures can paint a thousand words then, motion pictures can paint a million. Digital video is usually produced from analogue video as it is much easier to transmit digital data and the advantages of digital over analogue are quite pronounced. The conversion of analogue video into its digital equivalent requires a special hardware called video capture card. Beside animation there is one more media element, which is known as video. With latest technology it is possible to include video impact on clips of any type into any multimedia creation, be it corporate presentation, fashion design, entertainment, games, etc. The video clips may contain some dialogues or sound effects and moving pictures. These video clips can be combined with the audio, text and graphics for multimedia presentation. Incorporation of video in a multimedia package is more important and complicated than other media elements. One can procure video clips from various sources such as existing video films or even can go for an outdoor video shooting.

The entire video available are in analogue format. To make it usable by computer, the video clips are needed to be converted into computer understandable format, that is, digital format. Both combinations of software and hardware make it possible to convert the analogue video clips into digital format. This alone does not help, as the digitised video clips take lots of hard disk space to store, depending on the frame rate used for digitisation. The computer reads a particular video clip as a series of still pictures called frames. Thus video clip is made of a series of separate frames where each frame is slightly different from the previous one. The computer reads each frame as a bitmap image. Generally there are 15 to 25 frames per second so that the movement is smooth. If one takes fewer frames than this, the movement of the images will not be smooth. To cut down the space there are several modern technologies in windows environment, especially these technologies compress the video image so that lesser space is required.

However, latest video compression software makes it possible to compress the digitised video clips to its maximum. In the process, it takes lesser storage space. One more advantage of using digital video is the quality of video will not deteriorate from copy to copy as the digital video signal is made up of digital code and not electrical signal. Caution should be taken while digitising the video from analogue source to avoid frame droppings and distortion. A good quality video source should be used for digitisation.

Video is good for, promoting television shows, films, or other non-computer media that traditionally have used trailers in their advertising. By giving users the impression of a speaker's personality, showing things that

move, for example, a clip from a motion picture. Product demos of physical products are also well-suited for video.

Audio has a greater role to play in the multimedia development. It gives life to the static state of multimedia. Incorporation of audio is one of the most important features of multimedia, which enhance the multimedia usability to its full potential. There are several types of sound, which can be used in multimedia. They are human voices, instrumental notes, natural sound and many more. All these can be used in any combination as long as they give some meaning to their inclusion in multimedia. There are many ways in which these sounds can be incorporated into the computer. For example, using microphone, human voice can directly be recorded in a computer. Pre-recorded cassettes can be used to record the sound into computer. Instrumental sound can also be played directly from a musical instrument for recording into the computer. The sound transmitted from these sources is of analogue nature. To enable the computer to process this sound, they need to be digitised.

As everyone knows that sound is a repeated pattern of pressure in the air and a microphone converts a sound wave into an electrical wave. The clarity of sound, the final output depends entirely on the shape and frequency of the sound wave. When digitised (recording into computer), the error in sound can be drastically reduced. Audio is to be converted, into digital format, to produce digitised audio in order to use them in multimedia. And these digitised sounds again can be re-converted into analogue form so that the user can hear them through the speakers.

Musical Instrument Digitisation Interface (MIDI) provides a protocol or a set of rules, using which the details of a musical note from an instrument is communicated to the computer. But MIDI data is not digitised sound. It is directly recorded into the computer from musical instruments, whereas digitised audio is created from the analogue sound. The quality of MIDI data depends upon the quality of musical instrument and the sound system. A MIDI file is basically a list command to produce the sound. For example, pressing of a guitar key can be represented as a computer command. When the MIDI device processes this command, the result will be the sound from the guitar. MIDI files occupy lesser space as compared to the digitised audio and they are editable also.

The main benefit of audio is that it provides an exclusive channel that is separate from that of the display. Speech can be used to offer commentary or help without obscuring information on the screen. Audio can also be used to provide a sense of place or mood. Mood-setting audio should employ very quiet background sounds in order not to compete with the main information for the user's attention. Music is probably the most obvious use of sound. Whenever one needs to inform the user about a certain work of music, it makes much more sense to simply play it than to show the notes or to try to describe it in words.

v) Multimedia Development Tools:

They are required for building applications and reviewing some of the products that are commercially available.

a) Presentation Tools:

These tools are necessary to create multimedia presentations on a personal computer. Presentation tools are tools like overhead projectors; these tools actually improve the overall effect and help the speaker to get his message across in a professional manner.

b) Authoring Tools:

These in contrast with the presentation tools support features such as layout graphic design animation control of branching and navigation of the manner in which the end user will be able to move through the application. Authoring tools may also provide screen design help to harness the layout of text images and places where user interaction is required. Libraries may support audiovisual and graphics.

2.3 DIFFERENT APPROACHES IN MULTIMEDIA

At the University of Siegen a multimedia was developed for teaching and learning software for materials for characterization techniques in an effort to improve the quality of teaching and learning and to increase interest in scientific and engineering subjects in younger students. A modular web-

based teaching platform was developed that uses multimedia tools to provide access to and information about state-of-the-art analytical techniques, visualize complex physical concepts, and use interactive and animated modules to improve student learning.

E-documents can be accessed to from three different perspectives beyond the plain keyword web search of the entire document. The first one is situation-depending delivery of multimedia documents adapting the preferred form like, picture, text and speech to the available information capacity or need exemplified by documents from the annotated media database of the Rijksmuseum. It goes beyond Quality of Service methods which insist on delivering information in the same form even if that is no longer effective. The use of ontology will provide access across diverse library categorisations as part of the World Wide Web Consortium (W3C) semantic web. The system translates codes in the one catalogue system into a set of codes in another expanding the potential access to digital heritage knowledge across all library systems in the ontology, which means shared knowledge such as AAT, Word Net and Icon Class. The access to the pictorial contents of paintings by computer vision techniques is used. Its concluded access is the key issue in digital cultural heritage, be it access by situational delivery of e-document of cultural heritage, be it access to diverse knowledge systems, or be it access to the pictorial content of the picture.

i) Access and Access is Real Access:

Eventually, all disciplines of society will be touched by the e-thing. It is generally recognised that the cultural heritage people are preserving for

future generations will profit considerably from passing over to the digital world. The digital e-world has several advantages over a paper-based world. The potential access to cultural e-documents is broader as the number of people on-line quickly approaches a billion. So the beauty of cultural heritage documentation can be shared and compared among a much wider audience. In a second level of access does not have to be linear plus a keyword index, as the common structure of a library and the books in the library, but may be much more complicated than that. E-documents holding knowledge may hide a complex referential system behind the document in the form of hyper-links. To do that in a systematic way also thinking document maintenance and extensibility into account requires storage in multimedia document standards. To provide plain access is one thing, but the digital world also provides the opportunity of a third level of access by personalising and localising delivery while it is dynamically adapted to the needs of the person, the machine, the task and its context. Creating cultural heritage is an access adapting itself to the display and channel capacity in the amount of bytes being provided. Such an access is one way to avoid an information overload of the system and potentially of the consumer of cultural heritage documentation. As well as access to a single, possibly on-line, possibly hyper-linked, possibly adaptive document, the digital world also brings archives much closer to one another. Where libraries grew in relative isolation with a denominative system formed in a local tradition, the Internet world breaks the locality of coding systems. From the interconnectedness, the need arises to move from the one categorisation to the other. In pictorial contents of paintings, computer vision provides the means to access the semantics of pictures. The trouble is that humans are so

good in assigning semantics to images, they deem understanding a scene as a trivial task. Nevertheless, one-third of the brain is dedicated to viewing, so the task cannot be completely trivial. Standard computer vision tools can assist in interpreting digital paintings in a number of issues. They can score the palette of the paints used by the artist and they can score the histogram of simple shape elements like points, lines and patches.

ii) User-Tailored Access to Digital Repositories

Users seeking access to cultural repositories want immediate access to information relevant to their task, suited for display on their device, which is to be transmitted over the available bandwidth and using media suited to their current situation.

iii) Ontology-Based Access to Heterogeneous Documentation

There is an increasing interest in using domain knowledge corpora that is ontology to aid multimedia annotation and search. This work is in line with recent efforts to arrive at a semantic web in which distributed information can be found and processed with the help of semantic annotations.

iv) Access to the Image Content by Invariant Computer Vision

Of all information forms, the pictorial information form is farthest away from a complete semantic interpretation. Key obstacles are what are known as the sensory data gap and the semantic gap. The sensory data gap gives a name to the fact that there are a million technically, bit-wise different data arrays which would be immediately associated by the human observer

or listener with the same object. Differences in lightning, scene or shadow make no difference in the interpretation for humans. This is radically different from coded and numerical information where one bit-representation stands for one interpretation. The sensory gap does not play a role in the analysis of pictures when studied at the facsimile, the literal level. As pictures of arts are always recorded in frontal view with white-light illumination, there is a standard representation. When studying the content of the scene, the sensory gap is present in full glory as each object is painted under different illumination and different pose. So if one wishes to address the objects in a physically realistic painting, one has to use an invariant representation taking away the accidental illumination conditions. In addition to the sensory gap, there is the semantic gap. The semantic gap is the difference between the immediate interpretation of pictorial information in all its different forms and the interpretation that follows from a formal description of the object. As formal descriptions in the end are the only commodity the computer can handle, the semantic gap is to be bridged when the desire is to address the pictorial contents of an image by a set of lingual codes such as ICONCLASS, is a specialised library classification designed for art and iconography. The semantic gap is to be approached by a combination of top-down term translation and bottom-up feature description.

The integrated approach to semantic understanding of pictures with heterogeneous library access is happening by extending the formal systems, a user may immediately access the pictorial content from the digitised painting in addition to the denominative efforts of art historians' cataloguing.

English language learners are frequently unable to benefit from the prevailing process-writing approaches due to a lack of grammar and vocabulary knowledge relevant to academic writing. Technology-supported approach can be adopted to teach grammar and utilised in improving the writing strategy for the ESL learners. The need for explicit grammar instruction as part of preparing students to write can be addressed by using a collection of learner texts and transforming that collection into an online grammar resource for intermediate non native speakers (NNS) of English. Drawing on research in grammar and writing, the use of learner texts, and online interactivity, we outline the development and the prototype of the Internet Writing Resource for the Innovative Teaching of English (iWRITE). We discuss how the judicious use of advanced technology, Extensible Markup Language (XML), facilitated the implementation of iWRITE, an example of one possible approach to embodying aspects of second language acquisition (SLA) theory while taking advantage of the Web's potential for interactivity.

In the classroom application, iWRITE has immediate pedagogical applications in that it can be used to raise learners' grammatical awareness, encourage learner autonomy, and help learners prepare for editing or peer editing. First, iWRITE's Solutions section can be used to help learners understand the terminology or metalanguage is necessary to begin to ask specific questions about grammar, which is one important aspect of becoming an autonomous learner. The Solutions section presents the error terms and examples using appropriate grammatical terminology. The Essays section allows learners to dissect essays in layers since they can look at

different categories of errors at the word, sentence, or paragraph level. This section is ideally suited to classroom settings because it does not confront learners with an overwhelming number of errors at the same time. Plus, the essays are accessible by the writer's country of origin. Therefore, this section can be used to prepare for upcoming peer-editing sessions in that readers can review essays written by a writer from the same country as the one they will read during the peer-editing session. The Practice section can be used to generate worksheets as Word documents, which can be used in a small group activity in which each group member is responsible for finding and correcting specific mistakes at the word, sentence, or paragraph level. Upon completion, the individual members can collectively correct the essay and compare the errors they detected with the ones accessible through iWRITE. The last major section, the Marking section is aimed at encouraging learners to interact cognitively with the audio/video annotations of an essay. It can be used for peer-editing or error-detection exercises in which unmarked essays can be downloaded and marked up and corrected by learners who can then verify their choices using iWRITE.

v) Designing a Template for the Multimedia Presentation

The multimedia authoring package, Macromedia Authorware was both used to develop lecture presentations. Authorware provides tools for creating multimedia presentations that use text, graphics, sound, animation and digital movies.

vi) Development of Computer-Simulated Multimedia Presentations

In this method the mechanical vibration lecture presentation mode is adapted. Development of the screen presentation is followed here. Classroom lectures were video-recorded first. Then the audio track of the video-taped lectures was transcribed onto paper to obtain a written record of the spoken lecture. This proved very useful in building the storyboard. The amount of material which can be presented on one 'page' of the multimedia presentation is dependent upon the size of the presentation window which is set by selecting the screen size in the Authorware file set-up. Enough space was left at the top and the bottom of each presentation window to display the 'where am I' indication bar and the navigation button bar. A style guide was prepared specifying a preferred format for items such as font size, font type and background colour etc. in order to maintain a similar look and feel throughout the presentation. Once the storyboard was developed, the next task was to develop the screen presentation by integrating various elements of the lecture material into the template using Authorware. This was achieved by gradually adding the text and graphics into consecutive presentation windows. Pauses were introduced into the Authorware flowline between presentation icons so that the text and graphics appeared on the screen at a similar pace to that of the classroom lecture. The wait icons provided in Authorware were used to introduce pauses. A completed presentation window is known as a 'page'. Text and graphics were added to the consecutive presentation windows as before in order to complete the next 'page'. Using this method the entire lecture presentation on mechanical vibrations was constructed.

vii) Adding Audio Files to the Presentation

The previously transcribed audio track from the video recording of the lecture material was used as a basis for writing the voice scripts. The lecturer was asked to re-record the relevant voice scripts onto an audio tape. These were then captured into a computer and saved as digital sound files. Each sentence was treated as a separate voice file. The sound files were edited to remove long pauses and unwanted noises before integrating into the Authorware presentation flowlines. Audio-visual synchronisation was done manually by adding wait icons into the flowlines and by adjusting the wait time of existing wait icons. The wait time for each wait icon was determined by the trial and error method of playing a very small section of the audio-visual presentation while adjusting the wait time until the visual screen presentation was synchronised with the voice.

viii) Trial Evaluation of the Mechanical Vibration Material

The multimedia presentation was provisionally evaluated using staff and students in two separate stages, and the necessary modifications to the presentation were carried out accordingly. In the first stage, a small number of staff members from non-engineering backgrounds but who were familiar with the development of distance learning material were asked to check the lecture presentation for consistency and the appropriateness of the style. They were also asked to comment on the general appearance and the pace of the presentation. After the modifications were carried out based on the first stage of evaluation, subject specific evaluation was carried out on students studying mechanical vibration at the University, as the second stage of

evaluation. They were asked to comment on the appropriateness of the subject matter and to proof-read the contents of the presentation. Again, modifications were carried out accordingly as a result of the second stage of evaluation.

ix) Development of the Screen Presentation

The screen presentation has to be developed to tally with the lecturers' commentary. Because of that, the development process of this screen presentation was time-consuming compared to that of the mechanical vibration presentation. It took almost twice the time of the mechanical vibration material. The purpose of using this approach was to develop the vehicle dynamics multimedia lecture presentation as closely as possible to that of a live lecture by the incorporation of screen animations designed to enhance the lecturer's commentary. The recorded audio track was downloaded into a computer by dividing it into manageable size files. These audio files were transcribed to aid the development of the screen presentation, as in the previous case. However, a considerable time is spent editing the audio scripts to remove undesired noise and long pauses which were a result of using a recording of a live lecture. Based on both the printed lecture notes and the transcribed voice files, the storyboard for the visual presentations was developed. The same headings and section names as the printed lecture notes were used for the computer presentation to make easy referencing for the students. Once the storyboard was developed, Authorware software was used to develop the teaching material. As in the previous case, an individual 'page' of the multimedia presentation was created by gradually adding the text and graphics into consecutive

presentation windows. Overall, the development time of vehicle dynamics presentation, together with the preparation of audio scripts took almost twice the time of that of the mechanical vibration presentation.

x) Adding Sound to the Presentation

The next step is to integrate synchronised sound files into the presentation and this process is similar to the mechanical vibration presentation. Sound files were broken into very small sound files in order to synchronise with the screen animations when integrating into the Authorware flowline. It is advisable to use small size sound files to preserve the synchronisation of sound with screen animations when students run the multimedia package on computers having differing specifications.

a) Learning through Computers

Computer is a programmable machine. There are two characteristic principles of a computer, they are:

- It responds to a specific set of instructions in a well-defined manner.
- It can execute a prerecorded list of instructions.

It is a data-processing device. It is used for storage, generation and for communication of information. Thus, a computer is an electronic device that processes raw data to generate meaningful information.

Modern computers are electronic and digital. They are further divided into hardware and software. The machinery, wires, transistors and circuits

are called hardware. On the other hand, the instruction and data are called software.

Computer is used as an efficient tool by the student to discipline his own studies. He can store his notes in his memory and can recall them. He can make use of the professional help from the internet and the available websites. He can make use of them in the digital library. By making proper use of the available websites, the student can improve his study skills.

The teacher on the other hand can make the maximum use of the computer, and making his teaching effective. Slide shows can be arranged. It will provide a platform to improve one's own teaching performances.

b) Parts of a Computer

1. Central Processing Unit (CPU)

CPU is the heart of the computer, the component that actually executes instructions.

2. Memory

Memory enables a computer to store at least temporarily, data programmes.

3. Input Device

Usually a keyboard and mouse, the input device is the component through which data and instructions enter a computer.

4. Output Device

A display screen, printer or other such devices that one can see what the computer has accomplished.

5. Mass Storage Device

This allows a computer to permanently retain large amount of data. Common mass storage devices include disk drives and tape drives.

c) Types of Computers

Computers can be classified by their size and power which are as the following:

1. Personal Computer

Personal computer is a small single user computer based on microprocessor. It has a keyboard for entering data, a monitor for displaying information and a storage device for storing data.

2. Workstation

Workstation is powerful, single user computer. A workstation has a more powerful microprocessor and a higher quality monitor.

3. Minicomputer

Minicomputer is a multi-user computer capable of supporting ten to hundreds of user simultaneously.

4. Mainframe Computer

It is a powerful multi-user computer capable of supporting many hundreds of users simultaneously.

5. Super Computer

It is an extremely fast computer that can perform hundreds of millions of instructions per second.

d) Characteristics of a Computer

The characteristics of a computer are as follows:

1. Word length
2. Speed
3. Storage capacity
4. Accuracy
5. Logic operation
6. Versatility
7. Automation
8. Diligence
9. Economy of time and labour

e) Role of Computers in Education

1. Data

Data are represented by symbols like alphabets, digits, graphs, pictures, etc., in the form of facts and information that can be processed by and stored in a computer system. We use a keyboard to input the data.

2. Information

Information is the meaningfully processed data that can be used to know about the environment etc., to which the data relates. The change from little or no available software for tertiary education to drive for new programming and networks to share it is now taking place. While instrumentation is advancing rapidly, one hurdle to full utilisation of microcomputers and micro-electronics-assisted instruction. This will require the creative talent of experienced classroom teachers. It opens a challenging new avenue for contribution from those who are especially interested. Software generated nationally and internationally will help; it can be shared and made available to local college systems. However, teachers recognise that software must be modified and individualised to their own teaching styles and the need of the students. No two teachers are alike in the classroom and no teachers will find the same software completely satisfactory without putting their own creative ideas to it. This is a great new development and it opens opportunities for creativity that the teachers need to increase their professional satisfaction and status.

2.4 ADVANTAGES OF MULTIMEDIA

Multimedia enhances the text presentation alone and by adding sound and by giving numerous visual effects. It improves the traditional audio-video presentations. The people are more attentive and alert to the messages from the multimedia rather than the traditional presentation like the power point or the over head transparencies. The multimedia pictures the attention of the mass. These multimedia messages hold the attention of the mass

because it contains the following element, like text, audio, graphics and video. The communication mode namely, the aural and visual elements give great enhancement and offers greater understanding and retention of information. Those who are scared or intimidated by computer keyboards and complex instructions are more comfortable with pressing buttons with a mouse or on a screen. They are at ease while working on a computer. Multimedia has a dual purpose, it is entertaining and informative.

Multimedia in the classroom could include Power Point presentations that are created by the teacher, commercial software, such as multimedia encyclopedias that is used for reference or instruction, or activities that directly engage the students in using multimedia to construct and convey knowledge. The class can be divided according to the category based on their IQ and activities can be given to them. Students can prepare power point on a particular topic or can use their imagination and create a web site.

Multimedia activities encourage students to work in groups, express their knowledge in multiple ways, solve problems, revise their own work, and construct knowledge. The advantages of integrating multimedia in the classroom are many. Through participation in multimedia activities, students can learn the real-world skills related to technology and the value of teamwork. Effective collaboration techniques can be learnt. The impact and importance of different media can be known. The challenges of communicating to different audiences are understood by the individual. The students come to learn about how to present information in compelling ways, and the techniques involved for synthesising and analysing complex

content. The importance of research, planning, and organisation skills is known how to do it in an effective way. The significance of presentation and speaking skills is needed and how to express the ideas in a creative manner. It also makes one to accept and provide constructive feedback. Implementing multimedia activities in a classroom environment requires some planning, designing, developing, and evaluating. There is involvement from the user. Multimedia is easier to use and more economical compared to other. It makes the work more realistic with less effort. It has a widespread ease of access and can be easily modified. It is quick and easy for the instructor and quite sophisticated interactive methodology too.

2.5 CONCLUSION

Computer takes a pivotal role in the teaching-learning process. Computer and education are inter-linked; so it has become part and parcel in today's world. A good use of computers in any level of education would be a powerful store-house of information. It is presumed that multimedia-based teaching process would be more effective in the educational scenario. The multimedia teaching packages are also useful for students learning the material for the first time as well as for students revising the subject. Therefore, this chapter dealt with multimedia, different approaches of multimedia and its advantages. The next chapter deals with the review of related literature.