Chapter I

INTRODUCTION

The present world are moving into an information age. More and more, technology will shape the way we do our work. Our children are probably more comfortable with and familiar with technology than most of us. They need free access to technology and guidance in the profitable use of the information that they will be able to access with more facility than most of us who have the charge of educating them. With the information age and computers becoming more prevalent in work and play, it is important for schools and colleges to be prepared to manage technology in their facilities. For many people getting involved with multimedia, internet and new ways to deliver education will be the most exciting and rejuvenating experience of their professional lives. The public is keeping abreast with the technology changes. More than ever, individuals value the importance of technology changes in education. Take a look at the following releases of public and student opinion on technology and education:

In a January, 1995 survey by Microsoft Intelliquest, public opinion recognizes the importance of: 89% of parents (84% of general population) believe computer skills are important to
educational success. 86% of computer-using children believe computers' skills are important to getting good grades in school. 92% of children think computer skills will help them earn higher salaries in future jobs. 77% of teachers (67% of general public) think computers help each child learn at his/her own pace. 61% of American (56% of teachers) believe that computers help develop kids’ creativity. (Iskander et al., 1992)

In a 1994 Software Publisher's Association (SPA) study, research found that: Educational technology has a significant positive impact on achievement in all subject areas, across all levels of schools and colleges, and in regular classrooms as well as those for special-needs students. Educational technology has positive effects on student attitudes. The degree of effectiveness is influenced by the student population, the instructional design, the teacher’s role, how students are grouped, and the levels of student access to technology. Technology makes instruction more student-centered, encourages cooperative learning, and stimulated increased teacher/student interaction. Positive changes in the learning environment evolve over time and do not occur quickly. (Iskander et al., 1995)

Technology is making a significant, positive impact on education. Important findings in these studies include: Educational
technology as demonstrated a significant positive effect on achievement. Positive effects have been found for all major subject areas, in preschool through higher education, and for both regular education and special needs students. Evidence suggests that interactive video is especially effective when the skills and concepts to be learned have a visual component and when the software incorporates a research-based instructional design. Use of online telecommunications for collaboration across classrooms in different geographic locations has also been show to improve academic skills. Education technology has been found to have positive effects on student attitudes toward learning and on student self-concept. Students felt more successful in school, were more motivated to learn and have increased self-confidence and self-esteem when using computer-based instruction. This was particularly true when the technology allowed learners to control their own learning. The level of effectiveness of educational technology is influenced by the specific student population, the software design, the teacher’s role, how the students are grouped, and the level of student access to the technology. Students trained in collaborative learning, had higher self esteem and student achievement. Introducing technology into the learning environment has been shown to make learning more student-centered, to encourage cooperative learning, and to stimulate increased teacher/student interaction. Positive
changes in the learning environment brought about by technology are more evolutionary than revolutionary. These changes occur over a period of years, as teachers become more experienced with technology. Courses for which computer-based networks were used increased student-student and student-teacher interaction, increased student-teacher interaction with lower-performing students, and did not decrease the traditional forms of communication used. Many students who seldom participate in face-to-face class discussion become more active participants online. Greater student cooperation and sharing and helping behaviors occurred when students used computer-based learning that had students compete against the computer rather than against each other. Small group collaboration on computer is especially effective when students have received training in the collaborative process (Jeganath, 2003).

Technology acts as a catalyst for fundamental change in the way students learn and teacher teaches. Technology revolutionizes the traditional methods teachers’ use. Students become re-energized and much more excited about learning - resulting in significantly improved grades - while dropout and absentee rates decrease dramatically. For high school students in the program, drop-out rates fell from 30 percent to near zero, while absenteeism
was reduced from 8 percent to 4 percent. Teachers can and will embrace technology, if they are given the kind of professional development and support they need.

Technology implementation often stimulates teachers to present more complex tasks and material. Introduction of technology will tend to support teachers in becoming coaches rather than dispensers of knowledge. Technology use increases teachers’ sense of professionalism and achievement. Technology can motivate students to attempt harder tasks and to take more care in crafting their work (Jeganath, 2003).

A series of components, including the collection of public and private high-speed, interactive, narrow and broadband networks that exist today and will emerge tomorrow. It is the satellite, terrestrial, and wireless technologies that deliver content to homes, businesses, and other public and private institutions. It is the information and content that flows over the infrastructure whether in the form of databases, the written word, a film, a piece of music, a sound recording, a picture, or computer software. It is the computers, televisions, telephones, radios, and other products that people will employ to access the infrastructure. It is the people who will provide, manage, and generate new information, and those that will help other do the same. And it is the individual Americans who
will use and benefit from the NII (National Information Infrastructure). The NII is a term that encompasses all these components and captures the vision of a nationwide, invisible, seamless, dynamic web of transmission mechanisms, information appliances, content, and people.

**Preschool Software:** Computer programs and systems that help preschoolers learn to read, write and conceptualize. Using a simple keyboard or a touch-sensitive screen, the computer can present images of letters, animals or other objects. Many systems can also recognize and repeat sounds.

**Educational software:** Computer programs that enable children to learn math, spelling, geography and other subjects, often in the form of a game of adventure. Software for both individual and collaborative learning exists.

**Computer Simulations:** Programs with sophisticated graphics and commands that let a child practice real-world knowledge and decision-making skills to, for example, plan and manage a city, excavate an archaeological dig or explore the intricacies of an ant hill (*Alexis, 1999*).

**E-Mail (Electronic Mail):** Typed messages sent from one computer screen to another along with a network linking the units.
Transmitting messages from one computer to another offers children the ability to instantly communicate through written messages with scientists, teachers, other students and friends anywhere in the world.

**On-line services and the Internet:** Bulletin-board services and databases which give children access to vast amounts of information and enable them to interact with other people around the world.

**Graphics:** New creative tools allowing children to draw and to design their own original art and other imaginative creations.

**Distance learning:** Student in remote locations taking classes or visiting museums and libraries with live televisions, cable, computer or satellite hookups.

**Electronic Portfolios:** Keeping electronic records of a child’s work, which allows teachers and students to have easily accessible information.

Technology impacts health, physical education, recreation, and dance educators in the areas of research, classroom teaching, and distance education. While the overall effect is not yet fully assessable, the presence of technology in so many different aspects of the profession makes it important to more clearly recognize and
appreciate its current and potential role. This article focuses on uses of Internet on physical education and sports sciences. The greatest value of Internet may reside in the ability to provide improved support to classroom instruction. The development of individualized Internet users is becoming more common (Franz, 1998).

Multimedia technology has demonstrated its potential to transform every aspect of academic endeavor, from the development and dissemination of research, to classroom communications, and in student work. Our job in technology support services is to facilitate the judicious use of technology, and to make the most appropriate tools available to the campus community. Not every faculty member in every field will or should choose to make use of these tools, and many may find working with multimedia tools a needless distraction from the real business at hand. Others may incorporate new technology in their research, but find no value in using similar techniques in their classrooms. Students are, however, coming to campus with an increased expectation that multimedia will be used in the presentation of information, and that their own learning experiences will be processed through new media applications. Many faculty members find that creating multimedia projects whether for classroom use or
with wider audiences in mind forces them to reconfigure the approaches they have made to their area of expertise in ways that have interesting and fruitful implications.

The present century is rightly technological century due to the influence of advancements in the field of science and technology on the varied aspects of life, resulting in its modernization. The impact of scientific and technological advancements on education is so great that it has given rise to new discipline called Educational Technology.

To-day’s classroom practices are quite different from those of yesterday. Similarly, the classroom practices in the coming century may be quite different from those of today. One can easily find out the explanation for these differences in the obvious impact of technological innovation and inventions. The shape of future school, colleges and universities is bound to change radically due to technological impact in the years to come. There is a greater need to gear education and teacher education to meet the future requirements of the society utilizing the technological devices and chances. Educational technology has revolutionized the educational system. It has come in to stay for every for the enrichment of educational and instructional processes. It has greatly influenced the teaching learning process.
The major problem of teaching in our schools is how to accommodate instruction to individual differences of the learners. Educational technology has developed new innovate practices and strategies for this purpose. One such strategy is multimedia based modular approach.

Readers Digest defines multimedia as combination of modes of communication, such as video, audio and text etc. According to Encyclopedia of Education, the term “multimedia instructional system” refers to the use of appropriate and carefully selected varieties of learning experiences which, when presented to learner through selected teaching strategies, will reinforce and strengthen one another so that the learner will achieve pre-determined and desired behavioural objectives.

Multimedia means making appeal to different senses instead of one as in the traditional method. Multimedia includes High Technology Instructional Media (HTIM) (Pillai, 1988).

In teaching learning process in classroom situation different media are used viz., video, computer, teaching machine, films, filmstrips and other projected and non projected aids to make learning more effective. This not only makes communication effective and impressive, but also helps in motivating the children and creating interest in the lessons. It also helps in understanding
unfamiliar situations and aids in building concepts and development of creative thinking. Besides, it ignites the spark of curiosity.

Further, use of multimedia facilitates in overcoming certain inadequacies and deficiencies of the school system. The audio visual aids make the learning more effective particularly the individual and group learning. Under teacher student interaction it provides opportunities for teachers and students to work together in small groups to discuss, to question, to report, to be evaluated or to engage in other forms of personalized interaction outside the classroom experience. Thus, the multimedia can effectively bring forth better progress and developments in educational system.

The traditional teacher depends on verbal exposition. Considerable visualization of objects and process is essential for formulation of accurate concepts among the students. A teacher using multimedia can make even difficult concept clear to a below average student easily.

Moreover, in this fast developing world, where knowledge explosion is taking place in every sphere, it is unreasonable to expect that the spoken or written words alone could convey the volume of relevant information to the learner. The role played by multimedia packages for educational purposes is highly significant.
It helps to overcome barriers. It goes beyond the four walls of the classroom. It fulfils the gap in learning. Difficult processes can be shown with ease. Inaccessible places can be viewed by sitting in the cozy classroom.

Those who have properly implemented the multimedia instructional system have reported that outcomes exceeded both single medium channel utilization and traditional verbal instruction.

Multimedia devices are more capable of penetrating deeply into human character with an immediate excitement than any other single medium. When these multimedia packages are sued as an integral part of the modules, the blend and the reinforcement of both will ensure effective learning.

Any discussion on multimedia without highlighting the current use of computers will be incomplete. One means of individualizing instruction that has been receiving a great deal of attention in recent years is computer-assisted instruction or CAI. The decreasing cost and increasing availability of micro computers in schools have led researchers as well as teachers to become more interested in CAI (Pillai, 1988).
The idea behind computer assisted instruction is to use the computer as a tutor to present information, give students practice, assess their level of understanding and provide additional instruction, if needed. In theory, a well designed CAI programme is nearly perfect at providing appropriate levels of instruction, as it can analyse student responses immediately to determine whether to spend more time on a particular topic or skill. The computer can be quite effective in presenting ideas, using pictures or diagrams to reinforce concepts. Finally, for most students, the computer seems to have a motivating quality of its own, so that they work longer and harder when using it than they would on comparable paper-and-pencil tasks.

Computer assisted instruction has its roots in programmed instruction and in the behavioral theories of learning. According to these theories, learning is accelerated by the use of controlled presentation of stimuli, followed by reinforcement based upon the learners responses. CAI programmes stress drill practice exercises; others teach students facts and concepts. Whatever their differences, CAI programmes generally share the following characteristics.

i) Use of structured curriculum.

ii) Letting students work at their pace.
iii) Giving students controlled, frequent feedback and reinforcement.

iv) Measuring performance quickly and giving students information on their performance.

Since most of the salient features of modularization are incorporated in CAI programme, CAI software developed as an integral part of multimedia based modules will, no doubt, facilitate the auto learning of slow learners.

Physical education is an essential and integral part of the total education program and makes significant contributions toward the achievement of desirable education and health outcomes through the medium of physical activity. Quality physical education programs promote the physical growth and development of children and youth while contributing to their general health and well being. They are based on a planned sequence of experiences in a wide variety of activities beginning with basic movement skills and progressing toward more complex sport, dance and other forms of movement. Ultimately, they should help young people keep physically fit and enjoy many forms of physical activity during the school years and continuing throughout life (Mohnson, 1995).
We envision students moving efficiently, enjoying physical activity, developing physical fitness and pursuing wellness as a part of lifelong learning. Therefore, we believe that physical education is an integral part of a comprehensive education and must be included on a daily basis. Finally, it should be understood that quality physical education is predicated upon having competent, dedicated, and knowledgeable teachers who utilize appropriate instructional techniques, strategies and assessments.

Physical educators need to make use of the latest computer technologies when promoting their programs. Establishing a CD-Rom with animation, Images and interactive for all Physical Education program is an effective way to provide factual and in-depth information. The greatest value of multimedia may reside in the ability to provide improved support to classroom instruction. More often than not, the appropriate instructional strategy is not included in the use of software. However, there will be times when instructional software is appropriate, depending on the learning styles of the students and the content of the lesson (Joseph, 1987).

New technology may create additional opportunities for learning in Physical Education. One of these new features is a
multimedia approach courseware combining sound, text, stills and video with interactive learning.

Need for the Study

A vision for education was cultivated to guide school and college systems. A greater dependence on new communication and computing technologies support new levels of student creativity and research. A change in the role of teachers is witnessed from "sages on the stage" to mentors, researchers, publishers, technology users, knowledge producers, risk takers and lifelong learners. Involvement of parents plays a major role in the education of their children and to work actively with teachers to connect formal and informal education. The modern world warrants the teachers to imbibe new skills such as abilities to quickly adapt to new situations and new technologies and to be able to process best amounts of information required in an info-society.

The problem is that some students find theory in physical education a boring one, with a huge amount of new vocabulary. It typically starts with Kinesiology, rushes through Biomechanics and Sports Medicine, and tries to distinguish between Anatomy and Physiology, and Sports Psychology, Training Methods and so on. Many of the (sophomore) students lack the study skills to abstract the important ideas in a lecture or chapter, organize the
information into a coherent whole, and then access that knowledge as required on tests. They therefore pursue some entirely different method of teaching via technology and are succeeding in removing the problem of students. One was a clear mismatch between the way the material was taught (by conventional chalkboard lectures to large sections--typically 50-150 students) and the way the textbooks presented the information (lots of pages of detail that really challenged the students to figure out what was important), and the way that the students were actually prepared to learn.

Words, either spoken or written, do not communicate ideas as well as images. Static listening to lectures or reading the textbook requires the students to build these images in their mind, and only the best few can really do this for themselves. The most successful courses involve hands-on laboratories in which students can explore and experience things for themselves, and take an active part in the learning process.

Multimedia are more than high technology buzzwords- it is powerful way to educate, entertain, and inform. It has taken the computer from communicating information as text to telling stories using pictures, sound and video. Multimedia has taken computer users from intimidating mainframe terminals to high-technology desktop systems that offer fun, adventure and interactive learning.
Multimedia technology is one of the main reasons, computers are becoming as common in the home as they are in the workplace.

Multimedia and CD-ROM technologies may be considered to represent the second wave in educational technology, taking advantage of technology developments in computers, communications and consumer electronics; the first wave may be considered to be the technology developments in audio, video and TV media, which occurred about 20 years ago. The first wave raised high hopes of the new technologies revolutionizing the teaching-learning practices worldwide, it was even suggested that they would make teachers superfluous. Very soon, the euphoria disappeared and the teacher regained his pre-eminent position, although with a changed perception of his role and responsibilities and of the students’ needs. It is no wondered therefore that educators have been rather cautious in advocating the use of multimedia technologies in education. The role of the teacher is not threatened, and the new technologies are only considered as adjuncts that complement the classroom processes.

**The Present Study**

The present study aims at developing a multimedia courseware in teaching Kinesiology for physical education students and finding out the effectiveness of the developed multimedia
courseware. The multimedia courseware meets the requirements of individualized learning. In the present study, individualized learning is integrated together in each instructional session of two major blocks namely, muscles and joints in the upper extremities.

**Statement of the Problem**

The purpose of the present study was to develop multimedia courseware in teaching kinesiology for physical education major. The study consists of two parts. The first part of the study was to develop multimedia courseware in teaching selected units in kinesiology for physical education major and the second part of the study was to find out the effectiveness of developed multimedia courseware.

**Hypotheses**

1. It was hypothesized that the multimedia courseware module of teaching in the selected units of Kinesiology would have better effect on learning achievement of the subjects.

2. There would be significant difference among the Pre test, Post test I and Post test II on learning achievement of selected units in Kinesiology.
Delimitations

The following were the delimitations of the study

1. The study was delimited to selected units of Kinesiology only to prepare the multimedia courseware.

2. In Kinesiology, the following units namely muscles and joints in upper extremities were selected for developing the courseware.

3. The preparation of multimedia courseware was used only for teaching the students in physical education major.

4. Only twenty men students were randomly selected as subjects from Dr. Sivanthi Aditanar College of Physical Education, Tiruchendur, TamilNadu, studying Master’s degree in Physical Education during the academic year 2005-06.

5. The selected subjects were taught with the help of Multimedia courseware on the selected units of kinesiology. English language was adopted to prepare the multimedia courseware.

6. The learning achievement was selected as dependent variable and teaching kinesiology through multimedia courseware was considered as independent variable.
7. Fifteen working hours were given for the subjects as learning hours. The subjects were tested thrice. Pre test was arranged before the experiment, the post test I was conducted after nine days and post test II was done after fifteen days on the learning achievement.

Limitations

1. The previous knowledge of students in the field of Kinesiology was not considered.

2. Though the subjects were motivated verbally, no attempt was made to differentiate the motivation level during the period of courseware and testing.

3. Knowledge and experience of the researcher in the field of kinesiology was not considered.

4. Availability of computer configuration, lack of expertise in the area of technology and computer of the researcher.

Definition and Explanation of the Terms

Computer

Computer is an electronic device, which can automatically accept and store input data, process them, and produce output
results by interpreting and executing programmed instructions (Pradeep, 2003).

**Technology**

A broader definition of technology is used to mean a tool or instrument which helps us to organize and accomplish specific tasks and goals.

**Multimedia**

Multimedia refers to transmitting of information to the pupils through audio and video devices rather than hierarchically from the teacher.

Multimedia is defined as more than one medium used in a single communication either sequentially or simultaneously (Pradeep, 2003).

**Computer Assisted Instruction (CAI)**

Educational material comprising the software, documentation and other media resources were explored with computer. It also refers to the teaching materials used in educational computing. It may be contrasted with hardware and software.
Courseware

Courseware is an electronic collection of multimedia-rich learning materials combined with varying levels of tutorial interactivity, which can be independently accessed by learners at any time and used at their own pace. Courseware can be made available on CD-ROM, over an intranet or through the Internet. Some writers use the term more specifically to mean computer aided instruction (CAI).

Kinesiology

Kinesiology is the science, which deals with the study of human movements in respect to muscles and joints.

Significance of the Study

1. There are various uses for technology in Physical Education besides the assessment and instructional functions. It is a great resource for communication and understanding of curricular content.

2. Computer based teaching offers a great deal in terms of broadening the curriculum and tapping into a creative way for learning and communication to occur.
3. The use of more technology in the classroom or on the playing field by physical educators would not only help them to keep up with the changing times, but also add a learning tool to the classroom setting.

4. We know that successful technology-rich schools and colleges generate impressive results for students, including improved achievement; higher test scores; improved student attitude, enthusiasm, and engagement; richer classroom content; and improved student retention and job placement rates.

5. Similarly, instead of reading about the kinesiology and seeing textbook pictures depicting, students can use technology to see the structure of the muscles and joints of the different angles.

6. Technology acts as a catalyst for fundamental change in the way students learn and teacher teaches.

7. Students become re-energized and much more excited about learning resulting in significantly improved grades. The dropout and absentee rates decrease dramatically.

8. Teachers can and will embrace technology, if they are given the kind of professional development and support they need.
Scope of the Study

Education technology has been found to have positive effects on student attitudes toward learning and on student self-concept. Students felt more successful in school, were more motivated to learn and have increased self-confidence and self-esteem when using computer-based instruction. This is particularly true when the technology allows learners to control their own learning. The level of effectiveness of educational technology is influenced by the specific student population, the software design, the teacher’s role, how the students are grouped, and the level of student access to the technology.

Students trained in computer-based learning had higher self esteem and student achievement. Introducing technology into the learning environment has been shown to make learning more student-centered, to encourage cooperative learning, and to stimulate increased teacher/student interaction. Positive changes in the learning environment brought about by technology are more evolutionary than revolutionary. These changes occur over a period of years, as teachers become more experienced with technology.

Many students who seldom participate in face-to-face class discussion become more active participants online. Greater student cooperation and sharing and helping behaviour occurred when
students used computer-based learning that had students compete against the computer rather than against each other. Technology can motivate students to attempt harder tasks and to take more care in crafting their work. Technology implementation often stimulates teachers to present more complex tasks and material. Introduction of technology will tend to support teachers in becoming coaches rather than dispensers of knowledge. Technology use increases teachers’ sense of professionalism and achievement.

Positive effects have been found for all major subject areas, in preschool through higher education, and for both regular education and special needs of students. Evidence suggests that interactive multimedia is especially effective when the skills and concepts to be learned have a visual component, and when the software incorporates a research-based instructional design. Use of online telecommunications for collaboration across classrooms in different geographic locations has also been shown to improve academic skills.

**Summary**

In Educational Technology (ET) and Technology Enhanced Technical Education (TETE), the role of the teacher will be expected to be quite different from what it is in traditional classroom
teaching. In the latter the teacher is the author, playwright, actor and director, with the actor’s role assuming the major significance; while in the former, he will be more of a director and a coach/facilitator. One of the principal distinctive features of the new ET/TETE system will be the opportunity provided for individualized, self-paced learning, which caters to the individual abilities and aptitudes of the individual learners, and the possibility of one-to-one interaction with the teachers. This will also offer better opportunities to provide feedback and permit effective assessment of learning.

Studies on the theories of learning have demonstrated that more than one sensory channel dramatically improves comprehension and learning. The following hypothesis appears to be largely indicated; “I hear and I forget; I see and I remember, I do and I understand”. Multimedia tools incorporate the above-mentioned features, and hence have the potential to result in optimal learning.

The purpose of this study is to make physical education program as an effective one through introducing multimedia courseware in classroom teaching. It is hoped that the multimedia courseware will provide useful ideas that can be implemented in a variety of settings. The multimedia courseware would prevent rote
memory and enhance learning process. Comprehending the given problem and acquiring skills through multimedia courseware is quite challenging. This felt need is realized in this study.