Media Selection, Incorporation and Utilization in Teaching and Learning

Introduction

Modern technologies play a significant role in education today. Educational technologies (by that we mean media rather than Educational Technology as a field of practice) help teachers to accomplish their tasks in a better, easier, faster and more effective way. If incorporated properly and utilized effectively education technologies possibly will make a tremendous impact on your students' learning experiences.

Currently, there is a shift from the traditional method of chalk and talk to more meaningful methods where students are active learners. The more recent thinking on education is resolved to develop the ability of the learners in creative thinking, problem solving, analysis and evolution (Bates, 2000). This shift has changed the way of teaching and learning. It has not only infused different media into teaching and learning situations but also empowered the students. Therefore as a teacher educator you should be conversant with incorporating appropriate media in your teaching and learning situations. In this reading we focus on media selection, incorporation, utilization and attributes of different media.

Types of Media

Educational media of all types support teachers and students to reap maximum benefits from teaching and learning situations. Each type of media has its own strengths and weaknesses. Therefore it is always helpful to know the types of media and the strength and weaknesses of each type when you select the most appropriate one to use in the teaching learning situations you plan for your students. The type or types of media a teacher can use vary from text books or print material which is considered as the oldest educational technology to computers considered as a more modern technology. Teachers can also use multimedia by integrating these types. We will now discuss some of these types to justify the use of media in teaching learning situations.

Print Media

The written word has been dominating the arena of education for a long period. Despite all the astounding advances in Educational Technology, the printed material still remains a main component of teaching and learning. Textbooks and modules are still used by students. You as a teacher educator have to refer to books, articles and journals for information. Then you have to disseminate the knowledge and insights gained through literature to your students. The student cannot always exclusively depend on you for learning. Therefore to enhance knowledge on what you have been teaching the student has to read print material.

Print is the commonly used media for dissemination of knowledge to distant learners. They can read the print material at their own pace in their own places. A majority of students in South Asia have expressed satisfaction with print material, as they consider modules to be appropriate for self-study (Gunawardene and Zoysa, 1995).

The advantage of print material is that it is always easily accessible. Texts also can present complex information. It can offer a balance between the ability of the writer to present large quantities of content through texts as well as images and the ability of the learner to build an overview of the entire body of the content (Nunes and Gaible, 2002). Conversely, if you fail to provide the learner with appropriate print media or if they are not satisfied with what you have provided, they can always find books related to your subject matter.

Preparation of print material is cheaper than multiple modes such as audio and video. It does not need the participation of many. Conversely, utilizing the prepared print material in the teaching and learning process is also less intricate. It is somewhat easy for the tutor as well as the learner. They are portable and easy to read and do not require technology to utilize.

However, there are many disadvantages in utilizing print media for teaching and learning. Print media exclusively utilized provides only one-way communication. You are not an active learner with print media because you cannot challenge what you are reading. Research indicates that successful learners use cognitive strategies to perform academic tasks or to improve social skills (Beckman 2002). Among these are strategies such as making associations and questioning. Using print media exclusively will not develop some of the cognitive strategies used by

learners. On the other hand to use print media effectively the learner should possess literacy and mnemonic skills.

If proper guidance is not provided print media could be ineffectual. Conversely, if print material is not learner friendly and easily comprehensible the objectives of the teaching and learning will not be achieved.

Audio and Video

Radio and recordings are considered, as audio technology. Audio is an excellent medium for overcoming problems in distance education. The message it communicates can reach the learner who lives very far from the tutor through air. Radio and recordings are also excellent in educating illiterates. Learners can record and use it for self-critical appraisal.

According to Newby et al (2000) audio may be more motivating than print alone but together with print may form a powerful alternative and aid to reading alone. Fahy (2004) states that online audio (including, when file sizes are large, distribution by CD and DVD) can be useful in teaching for following technical reasons,

- An audio summary of previous material can aid recall, help retention, and lead to concept formation and higher-order thinking.
- Although CDs and DVDs are one-way technologies (non-interactive, like a lecture), they have the great advantage of learner control.
- CDs and DVDs are easy and cheap to produce and ship, and so reduce cost and improve accessibility.
- The technology of discs is easy to use and familiar. Operating systems (Windows, Apple OS, and Linux) now usually offer built-in sound reproduction technologies for both streamed and static sound files.
- The mode of presentation most often found on this medium, the human voice, is a familiar and powerful teaching tool.

These reasons given by Fahy are relevant to offline (Face to face) teaching-learning situations as well. Teachers can mix audio technology with lectures to give firsthand information to students. Audio conferencing is a powerful tool when used with mixed technologies in online teaching.

A significant limitation of audio technology is that the communication process is one way. Therefore students are merely passive learners. Conversely, using audio technology is expensive. The learners cannot skim through the audio like they do with print material. However, it can be useful if combined with discussion groups.

Teachers should be equipped with necessary skills to prepare audios. If you read out a prepared script without maintaining a natural flow the learner will get bored and drift away from what he was listening. The narrator should be well trained before recording the audio. Correspondingly, the audios should not be too long.

Video on the other hand is a more powerful tool since both sight and sound can be used in teaching and learning situations. The learner has the advantage of making the video stop and start all over again if he so wishes. According to Roberts (1998), video adds a sense of direct involvement and physical presence among geographically dispersed learners. It gives distant sites live, interactive learning opportunities.

A disadvantage of video technology is that it is expensive and needs the services of several experts in different fields. It is a combined effort of producers, directors, subject specialists, cameramen, technologists and various other people. On the other hand Dufon (2004) states that in her research on *Video Recording SLA Ethnographic Research* she felt that the people being video taped did not want to be too intrusive. This may be the case if you try to video tape real life situations to give your students first hand information on any type of behaviour related to your lesson.

In Additional Reading 1 and Recommended Readings you will find more details about attributes of audio and video.

Computer

Computers are changing the appearance of and the behaviours in our classrooms. In this context teachers from preschool to higher education institutions must learn how to exploit this newest and most powerful tool of learning, or as Brayan (2000) states be trampled by the volume of information and skill development, which must follow technology's arrival**.**

There are two ways that computers can be used in teaching and learning situations (**http://socserv2.socsei.mcmaster.ca/soc/courses.soc4j3**). One

way is pre-programmed computer-based learning or CBL. The other way is computer-mediated communications. Both ways are utilized in distance learning.

Studies have shown that computers have the potential to effect and create significant efficiencies that may increase student achievement on standardized testing. The factors behind the success in this regard are class size, increased use of tutorial software, and increased student exposure time to the software (Bindwig, 2003). Baneszewwski (1997) explains how children developed self esteem by becoming peer tutors, learnt to manipulate a database as a tool for variety of tasks, completed a science project utilizing the capacity for data manipulation and developed time management skills with just one computer. This indicates that the computer is a powerful tool in providing effective learning experiences to our students.

Computers are also a mode of offering online courses offered by many organisations. It is also a powerful tool that can be used for integrating quality digital content into an existing curriculum (Bray, 2003b). Digital content include materials presented on websites, databases, video conferencing and many other resources that help students to be active learners. Computer networking (by that means system of electronic technologies including computers, printers, software, and databases) provides flexible and powerful new ways to accomplish a range of goals that long have been important in schools, such as gaining access to a universe of informational resources (including digital archives), establishing contact with students and professionals in other places and cultures, and putting teachers in touch with a broader community of educators in their disciplines (Honey 1999).

You may have observed that developed as well as developing countries today attach a great deal of significance to utilization of educational technologies in teaching learning situations. The computer is the main tool that has been utilized by many institutions for this purpose. However the benefits of incorporating technology into educational activities greatly depend on the teachers' training.

Multimedia

Multimedia was originally referred to combinations of audio, visual, and print materials delivered by various media (Fahya 2000). However, the term is considered as computer-based media today (Oliver 1998). According to Encyclopedia Britannica (http://www.encyclopediabrtannica.com) interactive multimedia is any computer-delivered electronic system that allows the user to

control, combine, and manipulate different types of media, such as text, sound, video, computer graphics, and animation. Interactive multimedia integrates computer, memory storage, digital (binary) data, telephone, television, and other information technologies.

According to Encyclopedia.com the Internet's premiere free encyclopedia (http://www.encyclopedia.com) multimedia is in personal computing, software and applications that combine text, high-quality sound, two- and three-dimensional graphics, animation, photo images, and full-motion video. In order to work with multimedia, a personal computer typically requires a powerful microprocessor, large memory and storage capabilities, a high-quality monitor and a video accelerator, external loudspeakers or headphones and a sound card (or sound board) for improved sound generation, and a CD-ROM or DVD-ROM drive, as well as special software to utilize many of these devices.

These definitions designate the highly advanced and sophisticated nature of multimedia. Nevertheless, they imply the efficacy and the significance of multimedia in teaching and learning.

Learning through multimedia is exciting and less time consuming**.** Multimedia presentations are self-motivating and allow the students to become truly engaged and immersed in the presentation (Shady, 2004). Furthermore, multimedia can be utilized for students with different levels and provide opportunities to reinforce skills and learning. It is also useful when student numbers are large.

As Bennet et al. (1999, p96) suggest:

“Dynamic stimuli, such as audio, video and animation may make performing such tasks as problem solving more relevant to student experience”

However they state that to accomplish this objective multimedia development must consider cognitive complexity, sensitivity to instruction, meaningfulness, reliability, fairness, and linguistic appropriateness.

You have now read the attributions of different media from black boards and print to highly advanced and more modern multimedia. Some strengths and weaknesses of different types of media are presented in the table below. Try to identify more strengths and weaknesses in each type to add to the list given in the table.

Table 1: Strengths and Weaknesses of Different Media

Media	Strengths	Weaknesses
Print	Provides convenient and random access to information Users control the process by which they gain the information (they can proceed at their own rate, choose what they really need etc) Portable, economical and easy to maintain Instructions are organised with common reading experiences, suggested activities, recommended readings etc.	Learners become passive readers Learning task is more reading to remember than finding or problem solving Some students (Students with poor reading abilities) may find reading challenging
Audio/video, Radio/TV and Teleconferencing	Dynamic, learner controlled, vicarious experiences Convenient, students can listen/view at any time of the day. Students can record information Instructional and simulation games can be used Real life situations can be presented	Costly Needs skills to develop Time consuming Complexity Availability of incompatible systems in the market
Computers	Motivate the students, Facilitate unique learning environments. Students are linked to information sources Distance is no barrier (Virtual classes and virtual libraries) Students can become active learners (e.g. Problem solving and higher order skills can be applied) More individual control and more flexible to schedules when using stand alone computers Increases teacher productivity-Can be used in multimedia instructions Can track students' progress	Costly Teachers and students need to be equipped with necessary skills (computer literacy) More complex as a medium Increased communications results in less privacy Risk of plagiarism Schools lack infrastructure to keep up with new innovations Become obsolete
Multimedia	Multiple and helps active learning Can provide to suit individual differences Effective instructions across learning domains (Newby et al, 2000) Interactive, promotes higher order thinking skills	Costly, Needs special training Teachers will find transforming material challenging and time consuming

Media and the Teacher

According to Garry and Graham (2004) the teacher is the most important piece of equipment. The effective technology use begins and ends with the classroom teacher. This shows how important it is for a teacher to know **what to select** and **how to incorporate** and **utilise** media into teaching learning situations.

To incorporate media into educational activities effectively teachers need to develop a positive attitude towards new technologies. They must observe the current resources and the types of applications used in the past and the current scope of the field (Roblyer, 2003). Furthermore, they should be able perceive the current and future role of media in education and envisage how it can help their own teaching. As Honey (1999) suggests students cannot be expected to benefit from technology if their teachers are neither familiar nor comfortable with it. The primary reason teachers do not use technology in their classrooms is a lack of experience with the technology (Wenglinsky, 1998; Rosen & Weil, 1995).

Teachers have to be knowledgeable about different types of media. It is important that they acquire necessary skills that would help them to select appropriate media and integrate into their educational activities. For this task they must possess sound understanding of media operations and concepts. You cannot expect a teacher to acquire a specialized knowledge in all types of media. But they should know how to get the help from experts in the type of media they prefer to utilize. However, in case of computers they should be computer literate to incorporate the computer into teaching and learning. Computer literacy does not mean that the teacher should be a programmer. But teachers should have the basic computer literacy and knowledge to select wisely among available alternative products.

However, to make your educational activity a success a professionally trained staff is a compulsory requirement in a classroom where multimedia is utilized. You as a teacher educator should have the necessary skills, technical know how and the proficiency to incorporate multimedia into curriculum if you are going to use technology in your teaching-learning situations. Since benefits of computer technology will greatly depend on the tutor's knowledge and skills you will have to read "*Additional Reading 3"* for more information.

Good indicators for measuring technology proficiency are generally in the form of performance measures that are based on clear and reasonable criteria (http://www.nces.ed.gov/pubs2005). The *Educational Technology Standards and Performance Indicators for All Teachers* established by the International Society for Technology in Education (ISTE) (cnets.iste.org/teachers/t_stands.html) is one example of measuring technology proficiency. These standards specify a desired performance profile for technology-literate teachers. We also can use such performance standards to assess our teachers' technology skills.

Selecting appropriate Media

Now you know the types of media, their strengths and weaknesses and the skills and attitudes you have to develop to incorporate and utilize media into educational activities you plan and design for your students. In this section we shall discuss about selecting appropriate media.

Before selecting appropriate media for your teaching and learning it would be feasible if you paid attention to a few "wh" questions regarding your learners.

These are:

- Who are my learners?
- What do they know?
- What am I teaching?
- What will help them to learn what I am going to teach?
- What method should I use?

These questions will help you to select a media, which you can incorporate into learning experiences. If the teaching and learning situation is face to face you will use demonstrations, discussions or workshops. If you know how to select, incorporate and utilize appropriate media your method is definitely going to make a positive impact on the learner. If it is distance education, in addition to the above-mentioned methods you will utilize media from print material to more advanced technologies such as teleconferencing. Whatever the method and media maybe the most important point is the relevance. The "wh" questions will certainly guide you to discover the relevance.

Finding answers to abovementioned questions will also lead you to determine the goals and objectives of your lessons. Since the goals and objectives of your lessons are a part of your teaching methodology it is directly linked with the media you are going to select. If you do not select media that would help you to achieve learning goals and objectives you have determined, your whole exercise would be futile.

Therefore the following statement of Piele (1989) is quoted here for you to understand how important it is to decide the learning goals.

> "There is evidence that when learning and technology goals are not decided upon before technology implementation, technology can become a drain on resources and add to the burdens of teachers who are already trying to do too much" (Piele, 1989).

Piele (1989) further states that the problem of technology being wasted can be avoided by formulating a vision for learning that connects to educational goals, values, and objectives for technology use.

Focussing your attention on the resources and facilities you have in your workplace is also important when incorporating media into your teaching learning situations. It is necessary that you have all the facilities required to incorporate the type of media you have in your mind. In developing countries some institutions may not have resources required to utilize modern technologies. Students also may not have access to media you have decided to select. In such cases you will not have much of a choice in selecting media. Therefore it is essential that you know what facilities your educational institution and the students have before selecting the type or types of media. Conversely, physical condition in a learning environment surrounding may affect the results obtained by using media. Therefore what ever media you select it should suit the physical conditions surrounding your learning environment.

The media you select should be suitable to your students' capabilities and learning styles. Their experiences preferences and learning styles will have an impact on the results of utilization of the media you selected. For instance a student who enjoys reading may benefit more from prints. But he can be motivated to use the computer to serf the internet. But you must be careful not to let your own preferences for particular media stand in the way of providing learning experiences your students need.

Apart from the abovementioned facts you have to consider the costs, and the technical quality of the media you select. Nothing is more frustrating than depending on machine that does not work well. Teachers also will have to maintain media such as computers and televisions. Therefore it is wise to think about costs, quality and maintenance beforehand.

Incorporating and Utilizing Media in teaching-Learning

Media utilization according to Hains et al (2000) includes the selection of the communications medium and the delivery systems. The acts of choosing a recent article for the learning package or using videotape in class that illustrates recommended practices in a local preschool classroom are cited as examples for choices about communication by Hains et al (2000). In short, adopting instructional technology in the process of teaching and learning could be described as media utilization. Utilization is critically linked to the practice of design (Hains et al., 2000).

Before the incorporating media for utilization it is always advisable to consider the 0following issues:

- Do the media selected for teaching and learning support the concepts, themes, and the philosophy of the curriculum?
- Is the objective for its use clear?
- Will it support creativity, problem solving and analytical thinking of the learner?
- Will it engage the learner in the teaching and learning process?
- Is the technical quality of the media satisfactory?

If you have found solutions to the above mentioned issues you can use your knowledge of learning theories to incorporate and utilize media effectively.

Bray (2003a) opines that identifying curriculum units that can benefit from, good classroom management skills, an environment that encourages risk taking and sufficient time to plan with teachers and experts are several factors that contribute to effective integration of computer technology into teaching learning situations. This opinion is relevant to incorporation of any type of media into teaching learning situations.

Media can be incorporated in the curriculum activities. It can be utilized to foster creativity in the classroom. Resources such as Logo, problem solving courseware, and computer graphics do not need artistic or literary skills. The students who lack these skills could benefit from the utilization of such media.

Media also can be utilized to transfer of knowledge, foster group cooperation and enhance students' self esteem. Problem solving material in highly videodisc-based formats allows students to build rich mental models of problems to be solved (CTGV 1991). They would enjoy the satisfaction of solving a problem. They do not need to depend on print. It is an accepted fact that in media based methods can be used in teaching subjects such as mathematics.

The teachers have to provide a technology enhanced environment to their students if they wish to incorporate media into teaching learning situations. Conversely, the media incorporated should be learner centred and meet the needs of students. It should allow students to focus on higher level tasks. At the end of each situation teachers can evaluate the impact of media used. It will help the teacher to improve or even revise the strategy used

Incorporating and Utilizing Multimedia in Teaching-Learning

Instructional software related to multimedia can be utilised by teachers in teaching learning situations. Drill Practice, tutorials, simulations, instructional games and problem solving programmes are some of the methods that could be used by teachers by incorporating multimedia into teaching learning.

Mayer (2001) has suggested incorporation of seven principles that govern the effectiveness of multimedia. According to Fahy, (2004) these principles not only describe the impact of multimedia on learning but also constitute a good basic primer for instructional designers working with media generally. You will read these principles in the *Additional Reading 1*provided to you.

Furthermore, you need professional training to handle computers effectively and create multimedia projects as an accomplished teacher educator to make the teaching learning experiences more interesting for your students. Therefore participate in the workshop organised for you and develop your capabilities as a technologist.

Summary

In *Essential Reading 2* we examined different types of media and their strengths and weaknesses. We also discussed about selecting appropriate media. We observed how media can help the teacher and how teacher has to develop positive attitudes towards utilizing media. The facts you have to consider when selecting appropriate media was also discussed here.

You are now aware how skills of the learners could be enhanced through incorporating media into teaching learning situations. We hope you will read the additional readings suggested and enhance your knowledge in media selection incorporation and utilization. You also will get an opportunity for hands on training in incorporating media into your teaching learning situations.

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Recommended Readings

Anderson T and Elloumi F (eds) *Theory and Practice of online Learning.* **http://cde.athabascau.ca/online_book/contents.html**

Ken Neo Tse-Kian (2003) *Using Multimedia in constructivist Environment in the Malayasia Classroom, Australian Journal of Educational Technology* **URL http://www.ascilite.org.au/ajet19/neo.html**

(**http://socserv2.socsei.mcmaster.ca/soc/courses.soc4j3**

For further reading about video technology you may refer to URL**:** **http://www.techlearning.com/story/showArticle.jhtml?articleID=16101295**

To enhance your knowledge on media selection, utilization and incorporation you may also visit the following websites and many more:

http://as.cmpnet.com

http://www.aed.org/publications/TechEdInfo

http://www.techlearning.com/db_area/archives

www.ncrel.org.sdrs/issues/methods/technology