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**Digitalization of education as a trend of its
modernization**

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Abstract

This paper has presented a comprehensive analysis of the processes of digitalization of education, most actively taking place in the modern world. The formation of a knowledge society and the digital stage of development of modern civilization culture still remains a continuing process, which itself is experiencing serious internal contradictions and problems, especially in our country. Traditionally education is centred on sources such as schools, teachers and print media. The learners reached the information sources by enrolling with schools, teachers and libraries. Prior to the digital era, information was not accessible by the majority of people, and even those accessed were unable to obtain current information with respect to today's context. The modern society wants to know the information as it happens and when it happens, and the world is moving from an information society to a knowledge society over a period of time many changes have occurred in different sectors of economy including the education system. Education sector unlike any other sector has seen many stages in its evolution. From Guru-Shishya system of conducting the class in open garden under the trees to closed class room lectures, presentation form of teaching with the aid of LCD touch-screen projector to online notes etc.

Keywords: education, digitalization, modernization

Introduction

Digitalization of education is a powerful trend in terms of reformation and modernization of global education environment. Digitalization means transformation of all information types' texts, sounds, visuals, video and other data from various sources into the digital language. Discussing the phenomenon of digitalization it should be noted that various analysts and forecast experts consider transition of education process into digital stage as the turning point in the history of education. Digital technologies help teachers to reduce paperwork: exercise books and reports are replaced by laptops or tablets, with all the required academic information available. Home tasks of students, except when special teacher's references are required, can be automatically controlled by software tools. Students gain apparent benefits as well. In Indian context, formal education was traditionally centered on schools and village level while non-formal education was centered in libraries at central places in the form of newspapers and books. Teachers delivered the formal education either following a textbook or notes prepared using books and their experiences. The learners enrolled and visited the places that offered formal education. The libraries offered supplementary reading material to enhance their learning as well as reference facilities. A teacher has to be well educated and Knowledgeable to be able to educate others. Thus teaching is an important profession and people respected them as they guided and assisted the learners to be useful citizens of the country. Due to the respect earned by the society teaching was one of the social service activities. The main aim is to integrate digital technologies in education process, so that they were going hand in hand both with teaching of certain subjects and with school education

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process in general. In that way the technologies of the 21st century should not only help the students to learn certain facts, but also to improve their competence, develop logical thinking and communication skills.

Supporting technologies and applications

There are a number of technology components available to built knowledge management systems. Local area networks, Internet and Intranets are the backbones. They provide transparent speedy transfer of knowledge among people and applications. Internet applications built using software and tools allow collaborative intelligent access to knowledge. Explicit knowledge could be represented using different media. Text, graphics, animation, sound and video are the media to represent them. Unlike the traditional media in forms of books information stored digitally can be preserved without any forms of distortion and they can be accessed easily and quickly from any part of the world.

- **Text**

Text is one of the most effective components of representing knowledge. The words embodied as text, convey a powerful message and this has been widely used in handwritten and print media. Most data and information is represented through this medium. It is impossible to convey an unambiguous message without text. To convey a message effectively the message should be specific, definite, concrete and precise. Selection of suitable fonts and size is important for legibility and aesthetic effects. Learning is concerned, summarized text is used to identify the important points and detailed descriptions are for explanations and subsequent supplementary reading.

- **Graphics**

Graphics Text and graphics are the basic components of multimedia systems. Text without graphics will fail to retain person's attention as well as long-term retention. Bitmaps (paint) graphics and vector (draw) graphics are two basic forms of still graphics. Each type has its own characteristics and satisfies different needs. Bitmaps stores the graphics as seen on screen while vector graphics stores the instructions of how the graphics is created. Colour is an important component of a picture. However when producing graphics colours should be chosen carefully to ensure effective and pleasing displays.

- **Animation**

Animation adds impact to a presentation. Unlike text and graphics these are dynamic time based media. The visual impact of animation is to harness the learning process. Animations usually take forms like moving an object across the screen, user-controlled movement of an object, bitmap flipping and full animation files. Authoring tools are used to create such objects.

- **Sound**

Sound all forms of verbal communication use sound. Technology has been used to transmit sound across the universe. Teacher's voice has been the primary focus in delivering knowledge. Sound could be represented using computers, and MIDI (Musical Instrument Digital Interface) and digital audio are the two basic file types used in multimedia systems. A multimedia system requires the use of speech, music or special sound effects. When used for

education, speech should be short, manageable and integrated with other media. It should be used as a complementary to text.

- **Video**

Video occupies the most disk space and bandwidth when used over the network. Hence video can be integrated with other media only through use of edited segmented video clips each conveying a specific message.

- **Internet**

Internet provides a cost effective global network backbone. It connects users from anywhere, as long as they have access to the web. This has allowed users to host information on their computers and make them available for others. Such computers need to be dedicated for that purpose as users will be searching for information at different times. These sites are called web sites and they are connected to the web on 7x24.

- **Intranet**

Intranet is used only within an organization, thus restrict access to information from outside the organization. The appropriate security measures implements such requirements. These web sites allow employees and authorized users to access information while protecting the same from others. This technology is used to share confidential information within an organization. Teachers and administrators could monitor the overall status of a student and hence take appropriate actions promptly. Teachers can also make their learning material and exercises available through them. Some e-learning systems runs on these networks with login accounts created for its users.

- **Search Engines**

Search Engines are very effective powerful tools that allow text based information retrieval. Web based search engines deploy different types of navigation strategies. Meta searching, hierarchical searching, attribute searching and content searching are among them. This facility is now widely used by most users of the Internet. This has helped researchers, teachers and students to reach the required information and acquire the knowledge.

- **Workflow**

Workflow Tools allow documents and other forms of information to be routed among individuals and applications according to predefined processes. Workflow tools allow setting up the workflow environment in terms of users, types of information, processes, timing constraints and alternatives. These tools are used in some organizations, but not yet exploited by the education sector. Teachers could use these tools to effectively communicate with their students. We see e-learning systems gradually incorporating some of these characteristics.

- **Sharing Knowledge**

Knowledge sharing is done among a network of people. Communication among people could be done through paper mail, fax and telephone. However these techniques are synchronous and less effective across geographical boundaries. IT provides more effective solutions through the use of e-mail, video conferencing, virtual meeting, and document collaboration.

- **E-mail**

E-mail allows sharing knowledge asynchronously. An individual could share Knowledge with a community by sending a message to a group of people. Distribution list eliminate the need for everyone to remember the names of the community and also ensure everyone gets the message.

- **Video Conferencing**

Telephone allowed voice communication among distant personnel. This has evolved not only to view a live video of the person but also to connect to a number of people. Although the technology is costly it is been used for scheduled meetings involving people internationally. Universities having campuses spread over a larger geographical locations have their staff meetings through such technology. Some universities use this technology for teaching as well. Students ask questions by posting them to the teacher using the technology. Such systems require each student to have their individual computer with the ability receive and interact with the system

- **Document Collaboration**

Document collaboration lets team members' work together with many other participants with documents or information in real time. Everyone can manage and use information in real time. Documents in digitized form can be transmitted to a remote place in the exact form and reproduced any number of times.

- **Change taken placed**

Availability of vast amount of information on the web has provided access to all types of learning material. The teacher's lecture notes are no longer the primary focus of a learning process, and the teacher's role and the student's learning process is changing.

- **Paradigm Shift**

Paradigm shifts in today's world have identified the Machine / Industrial era being replaced by Technology / Information era. Similarly production process has moved from Products to Knowledge, Workplace has moved from Physical to Virtual and its focus has changed from Worker to Customer. In terms of education this means we should create Knowledge that is accessible virtually with the focus on the student. Virtual access is achieved through Internet / Intranets. Techniques such as e-mail, web notices, discussion forums and video conferencing allow a student to access information without visiting the physical location of delivery. A typical interactive e-learning system will have these characteristics and thus demonstrates the paradigm shift.

- **Classroom Level**

Classroom Level Use of technology at classroom level was not possible until the teachers delivery mechanisms were aided with technology. Originally delivery mechanism was through verbal communication and then through the introduction of written media such as blackboards. Later through overhead projectors teachers were able to do the writing in advance and project them directly. Use of overhead transparencies allowed them to reuse written material but without improving them. With the invention of projection through a computer, a teacher can easily update his material as well.

- **Teacher's Role**

In the modern global learning environment teacher's role shifts from "dispenser of information" to "facilitator of learning" as he has only to guide the active students who are involved in using the e-learning material. Classrooms have been fully equipped with permanent multimedia projectors and computers and the facilitator needs to access the e-learning system through the Intranet. Teachers should not control the learning process as well as they should allow students to perform collaborative work.

- **Student's Role**

Student's Role some classrooms are equipped with computer access to all students. In such cases students interactively participate in the learning process. Now the student's focus is totally on the learning process than on copying note as the learning material can be accessed at a future time. Teachers should ensure that knowledge and skills are not presented to students directly, but are constructed by them in response to information and learning tasks. Teachers need to consider how these learning experiences could be encouraging to students who are performing this type of mental work.

- **Curriculum Characteristics**

Curriculum Characteristics In order to change the teacher's and student's role the curriculum also needs to be revised. Traditional curriculum would focus on fragmented knowledge and disciplinary separation. However now we should focus on multidisciplinary themes as future generation will need the ability to move through several different jobs. Thus establishment of basic literacy and focusing heavily on job specific skills is pointless, as one has to change jobs or manage many jobs by themselves.

- **Assessments**

Assessments With changes to the learning process the assessment methods should also change. Instead of measuring a student on fact knowledge and discrete skills, assessments should focus on application of knowledge. This will allow testing of problem solving skills of a student. Students should also be given tasks to demonstrate understanding and creativity.

- **Society**

Society using computers for public services is gradually wide spreading. Although these benefits are currently enjoyed by a small fraction of the population the availability will encourage others to join and enjoy the benefits of technology. For example, some banks have moved towards providing most of their services through the web. This includes managing their accounts, placing standing orders and settlement of bills. This allows the customer to make a virtual visit to his bank at anytime he wish and obtain the required service.

- **Infrastructure Facilities**

Educators confront with the issue of equity when they consider introducing technology to learn. To develop a country and provide everybody equal facilities is impossible with the existing free education system and the policy implementation processors. Trying to solve the equity problem and introduce technology at classroom level will

result in the country going backward compared to others as well as encourage migration as people are always looking for better learning opportunities and living standards. Every student must have computer access to successfully implement above ideas.

Conclusion

Over the last five years computers have been introduced to most educational institutes although its ratio to a student is very high. By making the educators aware of the available technology and some taking initiatives to implement them, some forms of reforms may take place. Whatever India do with respect technology requirements the world will be flooded with information and some people will use them effectively. They would be the people who have developed their skills to the level of finding problem-relevant information and interpreting and applying them in solving of problems.

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