Unit–8

TECHNOLOGICAL CHANGE
AND SOCIETY

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INTRODUCTION

Only change is permanent in this existing world, the informational technology brought changes in a real manner because it involves the technology. Technologies significantly affect human as well as other species' ability to control and adapt to their natural environments. Technology has affected society and its surroundings in a number of ways. In many societies, technology has helped to develop more advanced economies. Various implementations of technology influence the values of a society and new technology often raises new ethical questions. Examples include the rise of the notion of efficiency in terms of human productivity, a term originally applied only to machines, and the challenge of traditional norms.

Technological change is a term that is used to describe the overall process of invention, innovation and diffusion of technology or processes. The term is synonymous with technological development, technological achievement, and technological progress. In essence technological change is the invention of a technology (or a process), the continuous process of improving a technology (in which it often becomes cheaper) and its diffusion throughout industry or society. In short, technological change is based on both better and more technology. "There is nothing like returning to a place that remains unchanged to find the ways in which you yourself have altered."

Technology is helping teachers to expand beyond linear, text-based learning and to engage students who learn best in other ways. Its role in schools has evolved from a contained "computer class" into a versatile learning tool that could change how we demonstrate concepts, assign projects and assess progress. This unit will concentrate on the technological changes and its impact on contemporary society in general and particularly in the schools.

OBJECTIVES

After learning this unit, students will be able to:
1.   describe the relationship between technological change and society
2.   examine the different sources of technological change
3.   explore the effects of technology on jobs
4.   investigate the impact of technological change on Pakistani society

8.1 Technological Change and Society

Technology is the making, usage, and knowledge of tools, machines, techniques, crafts, systems or methods of organization in order to solve a problem or perform a specific function. It can also refer to the collection and utilization of such tools, machinery, and procedures.

It can strengthen as well as alleviate the impacts of human activities. The role of technology has recently moved to the forefront of both science and policy in addressing climate change. The long time span involved in climate change from decades to centuries puts technological change "in the driver's seat", because over long time periods technological systems are highly malleable, whereas in the short run they are largely inflexible.

Technology and society refers to cyclical co-dependence, co-influence, co-production of technology and society upon the other (technology upon culture, and vice-versa). This synergistic relationship occurred from the dawn of humankind, with the invention of simple tools and continues into modern technologies such as the printing press and computers.

Technology had become a trend to almost all aspect of the future nowadays. All had been conforming to how technology behaves. From the creation of new machines to the uses of micro devices that are now gaining recognition. As far as technology is concerned, almost all new created and establish things are in line with how technology affects it. Traditional ways of doing things are now beginning and slowly diminishing as new improved ways are starting to emerge. Even from the start of studying technology there are some downsides to its benefits. Technology is always viewed as a two way thing, giving benefits to the people and on the other side creates undesirable effect to the society as well as to the environment. Society today can be differentiate automatically to the way it looks and feel way back many years ago. There are many aspects and fields to which technology had affect the way people lived, from everyday living to political, social, economical, educational, and ethical issues of human beings. People had change greatly as technology had also been improving to help and address the needs of people in their application, whether to make work easier or to take pleasure and bliss out of the product from technology. If all would be enumerated to discuss all the effects of technology to how society now changes would have a long list of items. People are now discovering things that are to address their needs. Even communication is now very effective that distance is not an issue anymore. Even of greater distance, many people are able to be in touch with each other. Technology changes society by changing our environment to which we in turn, adapt. This change is usually in the material environment, and the adjustment we make to the changes often modifies customs and social institutions.

8.1.1 Educational Technology and Change

Educational technology, the incorporation of information technology into the learning experience, is a term that continues to evolve alongside technological advancements in the field. Educational technology has played a major part in improving the learning outcomes of individuals by personalizing the learning experience. The immediate responsiveness of computer based programs, and the self-paced private learning

environment that educational technology warrant seeks to promote higher levels of motivation among students worldwide. It has also provided greater access to education such as in the case of increased accommodation for students with severe physical disabilities and for students living in remote locations.

E-learning refers to the specific kind of learning experienced within the domain of educational technology, which can be used in or out of the classroom. Distance learning, computer-based training, and social networking tools are just a few examples of e-learning. Tools like TIGed (http://www.tigweb.org/tiged) combine engaging social networking technologies with citizenship and global education. Implementing such tools in the classroom addresses the pressing need for today's youth to be more aware of their global environment.

In our schools technology is playing its role. Association for Educational Communications and Technology (AECT) defines educational technology as "the study and ethical practice of facilitating learning and improving performance by creating, using and managing appropriate technological processes and resources" (Richey, Silber, & Ely, 2008). Technology of education is most simply and comfortably defined as an array of tools that might prove helpful in advancing student learning and may be measured in how and why individuals behave.

Gone are the days when the teacher stood in the front of the classroom and lectured while students simply took notes. Today the classroom is an interactive world where the teacher as well as the student is engaged with technology. Because today's young people are hooked up and plugged in all of the time, whether it is with text messaging, iPods, social networking websites and more, it is important that teachers find a way to engage them on a technology level. Technology in the classroom is doing just that keeping students stimulated by using the latest and greatest inventions in computers and digital media.

8.1.2 Instructional Technique and Technologies
Problem based learning, project-based learning, and inquiry-based learning are active learning educational technologies used to facilitate learning as well as leaning in social context. Technology which includes physical and process applied science can be incorporated into project, problem, inquiry-based learning as they all have a similar educational philosophy. All three are student centered, ideally involving real-world scenarios in which students are actively engaged in critical thinking activities. The process that students are encouraged to employ is considered to be a technology. Classic examples of technologies used by teachers and Educational Technologists include Bloom's Taxonomy and Instructional Design.

Activities

1. Make a checklist of educational technologies. Visit your respective institution and check the availability educational technology
2. Discuss with the school teachers, how and which educational technology helps them in improving their teaching practice and make a one page report based on the discussion.

8.2 Sources of Technological Change

There are subsequent three sources of technological change.
1. Research and Development (R & D)
2. Learning-by-Doing
3. Spillover

1. Research and Development (R&D)

Research and Development is treated as relatively uniform in formal models, the reality is that R&D includes a broad range of activities, conducted by a range of individuals, and focusing on a broad range of different technologies or scientific disciplines. The major purpose of R & D efforts is not to formulate or test theory but to develop effective products for use in schools. Products produced by R & D efforts include: teacher training materials, learning materials, sets of behaviour objectives, media materials and management systems. R & D efforts are generally quite extensive in terms of objectives, personnel, and time to completion. Products are developed to meet specific needs and according to detailed specifications. Once completed, products are field tested and revised until a pre-specified level of effectiveness is achieved. Although the R & D cycle is an expensive one, it does result in quality products designed to meet educational needs. School personnel who are the consumers of R & D endeavors may for the first time really see the value of educational research.

R&D is often classified by the degree:
- to which it focuses on fundamental advances in scientific understanding is called *basic science;*
- to which it focuses on improving or understanding how to improve specific technologies is called *applied research*.

a) Basic Research

Basic research is often assumed to be focused simply on improving scientific understanding without consideration of applications, this is not always the case; a great deal of basic research may be motivated by larger practical goals. e.g., curing diseases. Basic research can be further classified by the discipline(s) involved, for example, biology, chemistry, or some combination of disciplines. For example, much basic research has been conducted to determine principles of reinforcement and their effect on learning.

b) Applied Research

Applied research is conducted in a field of common practice and is concerned with the application and development of research based knowledge about that practice. In education applied research usually focuses on problems that need to be solved to improve practice. To the extent that general theories are tested, the results may be generalized to different education settings. For example, basic theories of human memory, developed through basic research, could be tested in a new curriculum to discern improved retention of science concept. Other examples of applied research in

education are studies that compare different teaching styles, identify characteristics of effective schools and examine the effects of lengthening the school day on student achievement. Educational research thus focuses on knowledge about educational theories and practices rather than on universal knowledge.

Applied research is designed to solve practical problems of the modern world, rather than to acquire knowledge for knowledge's sake. The goal of the applied scientist is to improve the human condition. For example, applied research has been conducted to test the principles of reinforcement to determine their effectiveness in improving learning (e.g., programmed Instruction) and behavior (behavior modification). Some studies, those located in the middle of the continuum, try to integrate both approaches by conducting controlled research in special or simulated classrooms, using school children, and involving school relevant topics and materials.

Applied research can be classified by the particular element of a technology area that it addresses, for example, fuel cell membranes or turbine blades. It is conducted by industry, government, universities, not-for profit companies, and research associations. Applied R&D focuses on improving specific, well-defined technologies (e.g. fuel cells).

2. **Learning by Doing**
The concept of learning by doing has been used by Kenneth Arrow to explain effects of innovation and technical change. Learning by doing represents the notion that the more an individual or an organization repeats a task, the more adept or efficient the organization becomes at that task.
"Tell me and I forget, show me and I remember, involve me and I understand"

*** Chinese Proverb***
This saying basically emphasize on learning by doing. This proverb is now used by many schools as a framework for teaching. Learning by doing refers to the capability of an individual to improve their performance by doing an action. The increased productivity is achieved through practice, self-perfection and innovations. Through learning by doing a teacher can help her students build a positive self-concept. There is really only one way to learn how to do something and that is to do it. If a student wants to learn to draw a ball, build vocabulary, or solve a puzzle s/he must have a go at doing it. For example, throughout history, youths have been apprenticed to masters in order to learn a trade or to get training from an experienced teacher. It means that learning a skill means eventually trying your hand at the skill. When there is no real harm in simply trying we allow novices to "give it a shot."

3. **Spillovers**

   Technological change in an individual, organization, country, or domain of technology that arises from innovative activities in another individual, organization, country, or domain of technology is referred to as a "spillover." Spillovers refer to the transfer of knowledge or the economic benefits of innovation from one individual, organization, or other entity to another.

Spillovers, uncompensated benefits that one person's activity provides to another. Parents decision to educate their children well, making them into productive, taxpaying, law-abiding members of society, benefits the people who buy the goods they will produce, the people who will receive the government benefits their taxes fund, and the people they might otherwise have robbed. Invention of a computer spreadsheet benefited not just Dan Bricklin and his customers, who paid for the privilege, but also the teachers who used this spreadsheet in his/her classroom. A teacher conduct a research to explore the results of some specific techniques that improves his/her students' performance and get published in a journal for his/her own benefits. General public and other teachers can get access and they can get benefit from his/her publication.

Spillover benefits aren't intentionally provided. We don't plant flowers to benefit our neighbors, parents don't educate their children in order to give the government more money, Dan Bricklin and the teacher certainly didn't develop the spreadsheet in order to benefit the competitors his invention would eventually attract. These benefits are not the result of selflessness. Instead, they are incidental "extras" they spill over to others as a result of decisions we, parents and Bricklin made for our own purposes. While seemingly insignificant to us, spillovers turn out to be enormously significant to society. We are all incidental beneficiaries, each and every day. Spillovers "are a ubiquitous boon for society" because we share a common environment, live in communities, and interact with one another. The educational and social importance of spillovers is recognized in many contexts, but may be most significant in the context of innovation.

8.3 Technology and Jobs

Technology is assumed to be neutral, being developed on the basis of efficiency and use-value. But there is considerable evidence to support an alternative view that technology is developed to serve the particular needs of certain groups in society, especially powerful groups such as corporations and government bodies.

New technologies unquestionably have eased the lives of millions of people in many ways. New technology, however, has not been restricted to consumer items. Industry also has seen its share of advances with effects that have devastated the lives of millions of workers.

Technological change plays a major role in shaping the quality of employment. However, little attention has been paid to its differentiated nature to the contrasting effects that new products or new processes may have on employment. Research and development (R&D),

design and engineering may lead to greater production and new jobs when they meet an adequate demand, and when they are not confined to replacing old goods. Technological changes, on the other hand, tend to replace labour with capital, often leading to productivity growth and job losses.

Computers, cell phones and the internet are just a few of the technological marvels created over the last few decades that have brought tremendous changes into our lives. Now we can communicate with our families, friends and coworkers from anywhere at any time just by picking up a cell phone or connecting to the internet. New technologies not only made our lives easy it also facilitate teachers to make their classroom environment conducive to learning.

Technology in the institutions allows teaching to expand quickly and efficiently. Educational technology such as video conferencing, power point presentations and e-learning has removed institutional boundaries that were previously limited. With educational technology, institutions can target a wider community base and grow to higher levels. In organizations technology made the jobs easy and manageable.

1. **Improve Communication**
   Educational technology is important because it improves communication in the organizations. Office workers are not limited to phone calls or inter-office mail to interact with one another anymore. Electronic mail allows staff to send messages instantly without interrupting the recipient. Educational technology also improves communication with students, parents and other community member because information can be passed through multiple channels almost instantly.

2. **Human Capital**
   Technology in the organization improves the efficiency of screening, recruiting and hiring potential candidates. Organizations/institutes utilize the Internet to spread the word about the organization and advertise job openings. Technology like personality assessments and screening tools allow to determine whether a potential candidate is an appropriate fit for the organization.

3. **Efficiency**
   Office technology saves times by speeding up the work flow process. Digital filing systems save space, paper and printing costs. The use of computer systems allows corrections to be made instantly. Resources like electronic files and access to information technology are available with the click of a button.

4. **Mobility**
   Technology in the organizations practically eliminates space and time. Video conferencing technology let the individuals of an organization to interact with one another on any part of the globe. Technology reduces travel costs.

5. **Employee Workload**

   Technology that helps to automate the processes and in the result it will help to reduce the workload of employees, freeing them up to work on other projects and assignments. New computer programs and software packages can help to collect and analyze data that would normally go unused or would take employees a good deal of time to extrapolate. New technology can also be used to help in improving the work processes and in turn it increase and the productivity for both the employee and the organization.

6. **Accommodations**

   Disabled employees are perhaps the largest sector of the staff that can benefit from technological advances. With new technology, doors open for disabled personnel who previously may have lacked the ability to work a specific job due to the inability of an employer to provide accommodations. In addition, technology can help in increasing the productivity of disabled individuals who are already employed. Technology, such as touchscreen computers, can help employees more easily access and operate common office equipment.

8.3.1 Impact of Computer Technology on Jobs

Computer technology has had a major impact on the working world. This includes improved and expanded communications, providing more work opportunities for the disabled, reducing paperwork, providing for expanded learning and creating a more collaborative work environment.

Technological change and its impact on the work force have become a focus of attention nowadays. The innovations include advanced communication systems, industrial robots, flexible manufacturing systems, computer-assisted design (CAD), computer-assisted manufacturing (CAM), computer assisted instructions (CAI), computer mediated instructions (CMI), and computer management system (CMS).

Jobs are assumed to be appropriate slots for people to do valid work in a most favorable method, for which they receive adequate reward. Technology helps youth and adults to achieve their goals. In partnership with local schools, government agencies, and businesses, technology provide individualized assessments, career and job placement assistance. Educational institutions gives individuals the opportunity to identify, evaluate, and train on the latest computer adaptive technologies; the School-to-Future Program providing tools and support for students to further their education and prepare for employment and Access-to-Jobs, an employment service for the individuals.

Computer training is vital for every job in current era. Educational institutions provide training that empowers individuals to work in a variety of careers, and continue vocational learning if they choose. Microsoft has provided software and financial support that allows individuals to integrate computer use training while we are teaching job preparation skills such as resume writing, web based job search skills, budgeting and presentation skills. Microsoft support has also increased individuals ability to provide

assistive technology training, integrated with basic computer skills. The assistive technology training is critical for so many individuals with disabilities who need accommodations to use a computer to be successful in school or at work.

Individual's goals are to achieve success in their education and careers. New technology helps individuals to find employment by helping them to understand what employers look for and expect from an employee. Microsoft Office skills help individuals; to create a resume, cover letters and a career portfolio. Professional communication skills can be developed by networking with employers and self-advocate for any accommodations individual might need. Through internet individuals are able to conduct a job search, obtain and maintain employment, and pursue their educational goals.

8.3.2 Computer Programming and Jobs

The control of technology and jobs to serve the interests of powerful groups can be illustrated in the area of computer programming. Until about 1965 almost all computer programmers were self-trained. Learning on the job was never found to be a difficulty. But in recent years it has become increasingly difficult to learn on the job, since it is difficult to get a job without undergoing fairly lengthy formal training. There have also been more and more restrictions on what a person is allowed to do in relation to computing. Formerly, people who wrote programmes also punched their cards and supervised the running of their programmes on the computer. They knew much about the physical equipment and software and its peculiarities because this knowledge was useful to them and because the information was readily available.

In recent years the running of programmes has been restricted to operators who themselves do little or no programming. Such tasks as card punching or the equivalent now the largest job category in the computing field, are done by people knowing nothing about the programme at all. Furthermore, the division of labour is being assumed in the design of physical facilities for computing. For example, computer terminals are designed so that ordinary typists can type in information without knowing anything about its meaning. Operating systems are designed so that many aspects of the system cannot be studied except with special access or permission. And the ordinary computer user has very little say in what and how computer facilities are designed. It is increasingly difficult to learn about many aspects of computing - such as computer hardware, operating, systems programming - except in courses for specialists, since the different aspects of computing are separated off into inaccessible domains. (These comments apply to large-scale computer systems. The rapid growth of smaller decentralised installations raises different possibilities and problems.)

All these developments are rational and natural-if one assumes certain priorities. The main aim in the development of computing technology and knowledge has been profit for computer companies and usefulness to organizations, such as banks and the military, that buy and use computers. Attention therefore has been focused on achieving the ability to perform certain tasks very efficiently, such as keeping records and accounts, without any assessment of whether those tasks are worthwhile. In the development of computer

technology and knowledge it has not been a primary aim to enable as many people as possible to be involved in designing, producing, using and understanding computer equipment. Neither has it been a primary aim to foster equality and despecialisation of computer tasks. The capabilities of computing facilities are oriented towards serving the demands of business and government and not the self-expressed needs of the people. This can be seen as at least partly the result of the development of these facilities being out of the hands of the people.

Online jobs for teachers are slowly on the rise which does not only mean teaching and tutoring. Many educators and post educators are finding the benefits of working as online educational consultants, presentators, workshop organizers. There are also numerous online freelance writing jobs for the educational writing markets such as writing curriculum, readers, textbooks, correlating academic standards; writing text passages and lesson plans; in addition to actual teaching online. Using the Internet to find teaching work online has quickly become a niche of its own and is continuing to grow. But the allure of online teaching jobs does in fact, demand a bit of research and it can be slow. And while using the Internet can be useful and even fun, it is not the only way to access information.

8.3.3 Teaching Employment Online
Eduwizard represents an online learning and teaching platform that is becoming increasingly popular with educators who are looking for a break or to diversify their knowledge and expertise of their subject and for students who are looking for a unique tutoring experience. Teachers looking for a diverse online teaching employment will be sure to find one here. These platforms work differently with regard to technology, so it's best to research and perhaps experiment accordingly. Technical issues might be another consideration as well as differences in time zones as some students live in other parts of the world.

Activity:
Visit different sites of online teaching employment and make a list of the teaching and learning opportunities provided on these sites.

8.4   Organization of Technology
Educational technology in a way could be traced back to the emergence of very early tools, e.g., paintings on cave walls. But usually its history starts with educational film (1900s) or Sidney Pressey's mechanical teaching machines in the 1920s.

The first large scale usage of new technologies can be traced to US WWII training of soldiers through training films and other mediated materials. Today, presentation-based technology, based on the idea that people can learn through aural and visual reception, exists in many forms, e.g., streaming audio and video, or PowerPoint presentations with voice-over.

The 1950s led to two major, still popular designs. Skinners work led to "programmed instruction" focusing on the formulation of behavioral objectives, breaking instructional content into small units and rewarding correct responses early and often. Advocating a mastery approach to learning based on his taxonomy of intellectual behaviors, Bloom endorsed instructional techniques that varied both instruction and time according to learner requirements. Models based on these designs were usually referred to as computer-based training" (CBT), Computer-aided instruction or computer-assisted instruction (CAI) in the 1970s through the 1990s. In a more simplified form they correspond to today's "e-contents" that often form the core of "e-learning" set-ups, sometimes also referred to as web-based training (WBT) or e-instruction. The course designer divides learning contents into smaller chunks of text augmented with graphics and multimedia presentation. Frequent Multiple Choice questions with immediate feedback are added for self-assessment and guidance.

The 1980s and 1990s produced a variety of schools that can be put under the umbrella of the label Computer-based learning (CBL). Frequently based on constructivist and cognitivist learning theories, these environments focused on teaching both abstract and domain-specific problem solving. Preferred technologies were micro-worlds (computer environments where learners could explore and build), simulations (computer environments where learner can play with parameters of dynamic systems) and hypertext. Digitized communication and networking in education started in the mid 80s and became popular by the mid-90, in particular through the World-Wide Web (WWW), email and Forums. There is a difference between two major forms of online learning. The earlier type, based on either Computer Based Training (CBT) or Computer-based learning (CBL), focused on the interaction between the student and computer drills plus tutorials on one hand or micro-worlds and simulations on the other. Both can be delivered today over the WWW. Today, the prevailing paradigm in the regular school system is Computer-mediated communication (CMC), where the primary form of interaction is between students and instructors, mediated by the computer. CBT/CBL usually means individualized (self-study) learning, while CMC involves teacher/tutor facilitation and requires scenarization of flexible learning activities. In addition, modern ICT provides education with tools for sustaining learning communities and associated knowledge management tasks. It also provides tools for student and curriculum management.

In addition to classroom enhancement, learning technologies also play a major role in full-time distance teaching. While most quality offers still rely on paper, videos and occasional CBT/CBL materials, there is increased use of e-tutoring through forums, instant messaging, video-conferencing etc. Courses addressed to smaller groups frequently use blended or hybrid designs that mix presence courses (usually in the beginning and at the end of a module) with distance activities and use various pedagogical styles (e.g., drill & practice, exercises, projects, etc.).

The 2000s emergence of multiple mobile and ubiquitous technologies gave a new impulse to situated learning theories favoring learning-in-context scenarios. Some

literature uses the concept of integrated learning to describe blended learning scenarios that integrate both school and authentic (e.g., workplace) settings.

a) **Integrated Technology Development**
Integrated technology development is defined as "the process of change of an organization in which organization and technology are designed and developed jointly in a task and need oriented way by the members affected: the organization members affected consider the existing problems, search and evaluate the problems´ causes, and consider measures to solve the problems.

(i) **Establishing the Process**: A process of integrated organization and technology development starts with the perception of a problem in the daily work of an organizational unit. If a member of the organization finds that certain organizational aspects are preventing an efficient performance of his actual tasks, he should have the chance to articulate problems. Based on this perception, the members of an organization who are affected by the problem should discuss whether there is a need for an integrated process of change.

(ii) **Analysis of the Actual State**: At first, the actual state has to be analyzed with respect to organizational structure, technology and qualification. The results of this analysis have to be discussed. According to the knowledge of the organizational unit about the problem and its objectives there are different methods for an analysis. This analysis can consist just out of a group discussion of the organizations' members to develop a common understanding of the problem. Such a discussion can be prepared by change agents using open interviews or different work psychological instruments for task and work analysis.

(iii) **Creation of Alternative Options**: Having clarified the actual state with its problems, it seems important to generate alternative approaches to its solution. These alternatives may include different combinations of organization, technology or qualification measures. Based on these alternatives, the members of the organization discuss and find a consentaneous solution. To judge the human centred potential of the different options, these alternatives can be evaluated with work psychological methods.

(iv) **Planning of the Interventions**: After choosing a development option the members of the organizational unit have to decide on interventions in organizational, technological, and qualificatory dimensions. If software has to be (re)implemented the establishment of the software development project happens in this phase.

(v) **Interventions**: Interventions derived from organization development plays a central role within the wider process of integrated organization and technology development. Their main issue is the change of formal and informal aspects of an organization. Concerning the structures and processes of an organization, dezentralization and new forms of division of labour may have to be introduced. Decentralized and cooperative structures are realized by formation of workgroups. Workgroup structures could be guided by concepts like semi-autonomous workgroups or linking pin systems. Methods to introduce work group structures are group dynamic techniques like training laboratories or team development.

(vi) Qualification for Participation: Furthermore, the individuals involved in organization and technology development must be enabled to participate in the process adequately. Therefore, the social competences of the participants have to be promoted. Social competences in this context are communicative and cooperative abilities as preconditions for an involvement in discoursive development. To take part in this process, an adequate capability for conflict management is necessary, too. These social competences can be trained by encounter group method, team development, training laboratories, group intervention. During the integrated process of organization and technology development there should be performed workshops for the promotion of social competences continuously.

8.5 Technological Change and its Impact on Pakistani Society

Schools are undergoing a major transformation as they transition to a digital learning environment. With greater opportunities to access information, collaborate with peers and teachers, and create new types of content, students are more engaged and have a stronger voice in their own education. Teachers are able to use actionable information to personalize learning based on individual student's learning needs and styles. In Pakistan technology is greatly affecting our schools and community.

1. **Communication**
   Communication had been developing even in the earlier days by the use of telephone and the use of radio and telegraph in the purpose of exchanging messages to distant places. Today, in Pakistan the population has telephones as a means of necessity. Cellular phones are also now very effective and efficient not just as an accessory but as a guide to everyday living of people. There are many applications that could be installed into this small gadget that could give many uses. Example of these applications is having a dictionary in the phone which is very helpful as guide, and also the conversion of many measurements.

2. **Lifestyle**
   People are greatly affected to the progress of technology that even everyone's lifestyle also changes. People live differently to how they are used to in the past years. When technology is very reachable and human beings are very much willing to adapt this kind of technology, change is not a very impossible path. Technology had greatly improved the way people are living. It develops the standard of living. Every action of men correspond a specific machine that could help men one way or another. Examples of these are computers to which people are doing almost the electronic works. For leisure times, as also discussed in our Future Technology subject, entertainment concerning the gaming console is of now in high definition that it is almost like life like that you can easily be addicted to it. The music industry is also in greater pace in development. More and more develop machines are now more capable of handling greater amount of data in terms of music files. Gadgets are also handling many features like having a screen for viewing the music video.

Technology also affects people in many different ways. Example of this is how people work. Before, many businesses are doing most of its transactions using only paper to list the day to day operations as well as the billings. Systems are now being developed and highly utilized by businesses to make their processes more effective than the traditional ways of doing it.

Doing business is also possible even if not having a physical presentation. Anyone can transact processes online as long as he or she has a credit card or digital money. The web offers many things that one could possibly imagine, from business to advertising and also to communication and gaming. Businesses consist of buying things online and selling products. Advertising also are in line to the businesses. Anyone can also book flights through the use of the internet.

Learning had been also in the verge of fully developing the use of technology by having its e-learning strategy. More and more students are now having forums and discussion using the internet. Classes are having their learning in the web. It is not necessary to be physically present in the classroom to be said you are doing great in school. This is also another way to which we can say that technology had greatly affect the way the society behaves nowadays. Because of the changes that are brought about by technology, people are conforming to it to be able to stay in way with how technology is moving.

3. **Cause of Skill Shortage is Complex**

Skill shortages could be traced back to the faulty educational system, myopic policy of labor export and persistent technical change. Educational flaws stemmed up from poor curriculum, inadequate teacher's training, and low public and private investment in education. The task of dealing with skill shortage is less urgent compared to the depression of labor surplus. Of course with fast-changing technologies demand for new skills would render some existing skills obsolete.

4. **Industrialization**

Technology has contributed to the growth of industries or to the process of industrialization. Industrialization is a term covering in general terms the growth in a society hitherto mainly agrarian of modern industry with all its circumstances and problems, economic and social. It describes in general term the growth of a society in which a major role is played by manufacturing industry. The industry is characterized by heavy, fixed capital investment in plant and building by the application of science to industrial techniques and by mainly large scale standardized production.

Industrialization is associated with the factory system of production. The family has lost its economic importance. The factories have brought down the prices of commodities, improved their quality and maximized their output. The whole process of production is mechanized. Consequently the traditional skills have declined and good number of artisans has lost their work. Huge factories could provide employment opportunities to thousands of people. Hence men have become workers in a very large number. The process of industrialization has

affected the nature, character and the growth of economy. It has contributed to the growth of cities or to the process of urbanization.

5. **Urbanization**
In Pakistan, the growth of industries has contributed to the growth of cities. Urbanization denotes a diffusion of the influence of urban centers to the rural surrounding areas. Urbanization can be described as a process of becoming urban moving to cities changing from agriculture to other pursuits common to cities and corresponding change of behaviour patterns. Hence, only when a large proportion of inhabitants in an area come to cities urbanization is said to occur. Urbanization has become a world phenomenon today. An unprecedented growth has taken place not only in the number of great cities but also in their size. As a result of industrialization people have started moving towards the industrial areas in search of employment. Due to this the industrial areas developed into towns and cities.

6. **Modernization**
Modernization is a process which indicates the adoption of the modern ways of life and values. It refers to an attempt on the part of the people particularly those who are custom bound to adapt themselves to the present time, conditions, needs, styles and ways in general. It indicates a change in people's food habits, dress habits, speaking styles, tastes, choices, preferences, ideas, values, recreational activities and so on. People in the process of getting themselves modernized give more importance to science and technology. The scientific and technological inventions have modernized societies in various countries. They have brought about remarkable changes in the whole system of social relationship and installed new ideologies in the place of traditional ones.

7. **Development of the means of transport and communication**
Development of transport and communication has led to the national and international trade on a large scale. The road transport, the train service, the ships and the aero planes have eased the movement of men and material goods. Post and telegraph, radio and television, newspapers and magazines, telephone and wireless and the like have developed a great deal. The space research and the launching of the satellites for communication purposes have further added to these developments. They have helped the people belonging to different corners of the Pakistan or the world to have regular contacts.

8. **Transformation in the economy and the evolution of the new social classes**
The introduction of the factory system of production has turned the agricultural economy into industrial economy. The industrial or the capitalist economy has divided the social organization into two predominant classes; the capitalist class and the working class. These two classes are always at conflict due to mutually opposite interest. In the course of time an intermediary class called the middle class has evolved.

9. **Unemployment**

    The problem of unemployment is a concomitant feature of the rapid technological advancement. Machines not only provide employment opportunities for men but they also take away the jobs of men through labor saving devices. This results in technological unemployment.

10. **Technology and war**

    The dangerous effect of technology is evident through the modern mode of warfare. The weaponry has brought fears and anxieties to the mankind. They can easily destroy the entire human race reveal how technology could be misused. Thus greater the technological advancement the more risk for the mankind.

11. **Changes in social institutions**

    Technology has profoundly altered our modes of life. Technology has not spared the social institutions of its effects. The institutions of family, religion, morality, marriage, state, property have been altered. Modern technology in taking away industry from the household has radically changed the family organization. Many functions of the family have been taken away by other agencies. People are becoming more secular, rational and scientific but less religious in their outlook. Inventions and discoveries in science have shaken the foundations of religion. The function of the state or the field of state activity has been widened. Modern technology has made the states to perform such functions as the weaker section and the minorities making provision for education, health care etc. Transportation and communication inventions are leading to a shift of functions from local government to the central government of the whole state. The modern inventions have also strengthened nationalism. The modern governments which rule through the bureaucracy have further impersonalized the human relations.

12. **Environment**

    Technology provides an understanding, and an appreciation for the world around us. Most modern technological processes produce unwanted by-product in addition to the desired products, which is known as industrial waste and pollution. While most material waste is reused in the industrial process, many forms are released into the environment, with negative environmental side effects, such as pollution and lack of sustainability. Different social and political systems establish different balances between the value they place on additional goods versus the disvalues of waste products and pollution. Some technologies are designed specifically with the environment in mind, but most are designed first for economic or ergonomic effects. Historically, the value of a clean environment and more efficient productive processes has been the result of an increase in the wealth of society, because once people are able to provide for their basic needs, they are able to focus on less tangible goods such as clean air and water.

    The effects of technology on the environment are both obvious and subtle. The more obvious effects include the depletion of nonrenewable natural resources, and

the added pollution of air, water, and land. The more subtle effects include debates over long-term effects e.g., global warming, deforestation, natural habitat destruction, coastal wetland loss. Each wave of technology creates a set of waste previously unknown by humans: toxic waste, radioactive waste, electronic waste.

Activities

1. How social changes affect your society and you as an individual? Give a pictorial explanation.
2. Use of advance technologies in classroom is greatly affecting classroom learning in our Pakistani schools. Give a comparative overview of public and private classrooms.

8.6 Self-Assessment Questions

1. The government should take effective role in regulating emerging technologies (the Internet, etc.). Discuss
2. Explain how social change can be experienced in technology.
3. Mention sources of technological change.
4. Briefly explain how technology can facilitate classroom environment?
5. Explore the technology that brought change around you, also explain the merits and demerits of that technological change.
6. Explain how technological change in one part of the society affects another?
7. Mention five areas of life where technological changes have been experienced in Pakistan?
8. Itemize 3 possible reasons why people may resist technological change and the tactics you will employ as a change agent to manage them.

8.7   Suggested Readings

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