

**SUBJECT: Educational Technology (SEM 4) SC5**  
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**TOPIC: Components of Educational Technology and their significance-Hardware, Software & Systems**

The scientific investigations of technological developments has brought about a rapid mechanization in field of education. It has resulted the introduction of technology in field of education.

**Hardware approach** mechanizes the process of teaching, so that teachers would be able to deal with more students with less expenditure in educating them

The hardware approach refers to the use of machines and other mechanical devices in the process of education.

The knowledge is preserved with these machines in the form of books which are shelved in the libraries, tape recorders and films. •

A teacher can impart knowledge himself to his pupils. Now a days, transmission of the knowledge is supported by machine like mike, radio and television.

In the research programmes, the main function is the collection and analysis of data. • For this purpose, presently the researcher uses the electronic machines and computers. •

The mechanization of teaching process is termed as the Hardware Approach

**The Soft-ware Approach:** • It uses the principles of Psychology for behaviour modification purposes

Newspapers, books, magazines, programed learning, micro- teaching, team teaching and other educational games etc. may also form part of software.

Soft-ware approach is characterised by task-analysis, writing precise objectives, selection of appropriate learning strategies, immediate reinforcement of responses and constant evaluation. •

Software approach refers to the application of teaching- learning principles to the direct & deliberate shaping of behavior. Its origin lies in the application of “behavior science” to the problems of learning & motivation

The so-called soft-ware and hard-ware approaches cannot be separated from each other. In a manner, both are inter-linked to plant and the seed of educational technology. • So both of them go hand to maximize the effects of teaching- learning process.

The software approach used the principles of psychology

Psychology of learning provides solid technology for bringing desirable behavioural changes in the pupils and thus serves the cause of education of laying down definite instructional procedure, teaching behaviour and behaviour modification devices

Software Approach is also termed as Instructional Technology or Teaching Technology or Behavioural Technology. • Newspapers, books, magazines, educational games, flash cards may also form part of software. • Software approach is characterised by task analysis, writing precise objectives, selection of appropriate learning strategies, immediate reinforcement of responses and constant evaluation.

Hence Software Approach is concerned with teaching objectives in behavioural terms, principles of teaching, methods of teaching, reinforcement of instructional system, feedback, reviews and evaluation. • Software approach tries to develop all the three basic components of technology, i.e. Input, Process and Output.

#### Hardware Technology Software Technology

- more concerned with the production and utilization of audio visual aid material and sophisticated instruments and mass media for helping teacher and learners in their task
- use of psychology of learning for the production and utilization of software techniques and materials in terms of learning material, teaching-learning strategies and other devices for smoothening the task of teaching learning.
- What is produced through software technology in the shape of teaching- learning material and strategy in being utilized by the hardware instruments and gadgets for effective teaching learning.
- tries to adopt a process-oriented technique or approach for the production of teaching-learning material and strategies. The material produced here is made available for being used by the hardware application.
- hardware technology clearly stands for making use of technology in education. It does not provide direct services to its users as provided by hardware technology and applied engineering.
- It helps in the production of software material being used by the hardware applications and gadgets for delivering their service to the users i.e. teachers and learners.
- examples of the appliances and gadgets being used in hardware technology service are radio, television, tape recorder, video, slides and film projectors, teaching machines and computer etc.
- material produced through software technology we can name, programmed learning material teaching learning strategy on psychology of learning (put into practice in the shape of charts, pictures, models, slides filmstrips, audio and video cassettes, software packages etc.)
- computer hardware in the shape of a machine like device is of no use if it does not make use of software services both for its operation as a machine and its multi-dimensional utilities. The use of application and utility software is in fact must for taking any service from the hardware technology of the computer.
- you can make use of programmed learning material a graph a text, etc. directly for the individualized as well as group instructions
- has resulted in improving the efficiency of educational, means and reducing the cost of education. A teacher may handle a big class with the help of hardware appliances like microphone, slide and film projectors etc. 8. also works for increasing the efficiency of the teachers as well as learning.

**SYSTEMS APPROACH:** •is a systematic attempt to coordinate all aspects of a problem towards specific objectives. •“a regularly interacting or independent group of items forming a unified whole.”

- . The teaching-learning process is viewed as communication and control taking place between the components of a system. In this case, the system is composed of a teacher, a student and a programme of instruction, all in a particular pattern of interaction.
- The teaching-learning process is viewed as communication and control taking place between the components of a system. In this case, the system is composed of a teacher, a student and a programme of instruction, all in a particular pattern of interaction.
- The system approach involves continuous evaluation of learning outcomes and utilization of knowledge gained by analysis of results of evaluation to suitably modify the plan of approach to achieve the stated objectives.
- Systems approach helps to identify the suitability of the resource material to achieve the specific goal. 2.Technological advance could be used to provide integration of machines, media and people for attaining the defined goal. 3.It helps to assess the resource needs, their sources and facilities in relation to quantities, time and other factors. 4.It permits an orderly introduction of components demonstrated to be required for systems success in terms of student learning. 5.It avoids rigidity in plan of action as continuous evaluation affords desired beneficial changes to be made.
- Systems approach requires hard and continuous work on the part of school personnel. Some are not prepared for the extra load. •iii. Lack of understanding. Teachers and administrators are still not familiar with systems approach. Though it has been successfully implemented industry, it has still to make headway in education

#### Reference

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**Approaches of Educational Technology**  
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