

Innovation in Educational Technology

C.Shobha Rao

Assistant Professor (Education)
Sri Sathya Sai College for Women
Bhopal (MP) India.

ABSTRACT

Information and knowledge are stuffed in myriad books in libraries and in other storage places round the globe. But every seeker may not, at the first place, have an access to and then be able to digest the contents when he/she goes through these directly. People concerned have been evolving techniques for the precise reason of sifting, explaining and disseminating the available information and knowledge among the seekers with ease. The extrapolation of the existing techniques may not be effective to do so as newer information and knowledge keep pouring in, in ever increasing volumes and complexity. Ever newer innovations in techniques have therefore to be invented to keep pace. This is what is being done by educationists, pedagogues and information-technologists incessantly at fervent pace. It is however not to say that innovation is the monopoly of these few alone. Every innovation-minded person may contribute their mite as long as the technique proves to be economical, ubiquitously available, simple, efficient and useful---the qualities that make it popular and adoptable.

I INTRODUCTION

With the increase in population and spread of education ever newer information and knowledge are emerging, aptly christened as explosion. Numerous books, journals, magazines etc; containing innovations, explorations, inventions, discoveries, concepts, definitions, clues, keys, formulae, ideas, processes, techniques etc; in different fields of knowledge, nay, ever newer fields of knowledge, are stuffing the global knowledge-bank compelling it to expand its size on a daily basis. In many cases, it is neither easy to access nor to digest the accessed information of one's interest. Hence the necessity is to find out newer techniques to access and explain the emerging interested knowledge. It is a curious case of inventing newer knowledge to easily access and understand the ever-emerging knowledge. Here are two examples of how innovation plays its role:

In the beginning addition of the same number many times took quite a lot of time and labour and was quite boring. To avoid this someone came up with the idea of multiplication. In this the number was multiplied with the number of times it was to be added to itself. Thus the concept of repeated addition was defined as multiplication. Since infinite number of multiplications of any number with any number might be needed to be carried out, someone again came with the idea of multiplication tables, in which cramming a minimum of nine tables (1 to 9) each up to nine steps was felt necessary. Children were made to learn them by heart. When this too was felt time-consuming, multiplication was resorted to using the concept of logarithm, using pre-prepared log-tables. Then this was replaced by some instruments: e.g; slide-rules, calculators, abacus, computers, computers and computers—ever advanced versions. The advancement of computers seems to have no limits as regards memory and speed --two vital parameters.

Another example is that of mushrooming coaching institutes catering to the competitive examinations. Methods to solve problems in as little time and accuracy as possible or memorizing large number of things in a trice using mnemonics are devised by their think-tanks. Every institute comes up with its own novel innovations or keeps improving on others'. Students and teachers sit together and brain-storm to refine or fine-tune the existing ones or invent newer ones altogether. This results in a synergy mutually beneficial.

II INNOVATION FOR EDUCATION SECTOR

They say knowledge is power. But innovation is knowledge. Innovation sprouts from comprehension. Understanding helps memorizing too. If one does not comprehend the subject, he can not explain, reproduce, analyse and synthesis much less innovate. He crams. Spoon-feeding or lack of hands-on practice results in cramming. Understanding needs practice and striving. The best method makes teaching and learning very interesting. The pupils do not look at their watches for the bell to ring but are so absorbed in the subject that they do not remember the bell having had rung. There are teachers who go to the board, write the question number, page number and the problem verbatim, all without looking at the book, work out the solution, without exchanging a word and ask the pupils to copy it. There are others that immediately create a conducive atmosphere, enquire about the difficulties, explain the concepts interacting with each pupil and get the solution from each, without spoon-feeding. One may study at a gurukul (modern residential schools), be an Ekalavya (a private candidate), a day-scholar or studying in any other mode: if the pupil, the teacher, or both are interested, learning even an esoteric subject becomes a child's play.

Innovation as per the working document of third regional UNESCO conference 1971 when paraphrased can be put as the introduction of a new idea, process or technique controlled and regulated by testing and interpretation. The steps involved in innovation therefore are invention, testing, evaluation, development, diffusion and adoption. Innovations at local level may dilute these standards.

Like every other branch of knowledge, today's innovation becomes tomorrow's stereotype or hackneyed. With myriad brains working incessantly all over the globe, it is difficult to distinguish between innovation and stereotype. For the one who comes across it for the first time, it may be innovation though otherwise it is a stereotype. But one thing is certain. Passive teacher-centered lecturing method is today, passé and obsolete. Also it is not advisable to resort to old 'innovations' in the presence of newer more efficient and effective ones. Nor do we have to invent the wheel again.

III RECENT TECHNOLOGY BASED INNOVATIONS

Innovations--old and new can be broadly categorized as: non-computer-based and computer-based. The various methods are: printing matter, charts, books, posters, cassette recorders, radio broadcasts, telephone transmissions, overhead projectors, films, television telecasts, telematics (blending of computers and wireless telecommunications technologies), teleconferencing, TV, VCR, audio-visual DVDs, pen-drives, multimedia (use of computers and video resulting in synergy), internet, intranet, Extranet (WAN-Wide Area Network), ICT (e-books, digital library, virtual laboratories etc.), podcast (series of digital media files released episodically enabling downloading. It enables sharing of information with anyone anytime), edublog (education website written by or for teachers), M-learning (mobile learning enables portability replacing books with small RAMs), E-book (an electronic version of a book), CD-ROM, laser disk, DVR, ubiquitous learning (learning anywhere anytime and any context), blended learning (combination of face-to-face class room instructions with online learning), Artificial Intelligence (AI), Local Area Network (LAN), ICT (Information and Communication Technology helpful in design, development, implementation, management and evaluation of learning), USB Drive, memory cards, Hard Drives, scanners, PSI (Personalized System of Instruction), CAI (Computer Assisted Instruction in which computer interacts with the learner), LCI (Learner Controlled Instruction), E-learning, Web-based learning, distance-learning, team teaching, simulated teaching, micro-teaching, classroom interaction analysis, Social learning, Virtual learning, methods for slow learners, mentally and physically handicapped, socially disadvantaged, those living in remote areas etc. it is, however true that an android can not replace a human teacher.

Cloud computing is the latest innovation by Apple which will revolutionize the learning process. In this all data processing and storage capacity are transferred to the cloud—the remote servers or data centres. Thus hardware, software and information are situated on a centrally located server on the internet rather than on a client computer. It will make the hardware smaller, simpler and cheaper. Computers and laptops will be done away with while smartphones and tablets would replace them.

There may be a zillion innovations teachers round the globe may be inventing or resorting to. It is not possible to describe all of them. Recently, it was reported that a professor in a foreign country demonstrates complex experiments in physics using unconventional locally available materials. There may be so-many not yet reported. It is the intelligence, zeal and resourcefulness that helps innovations happen.

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