TECHNOLOGY INTEGRATION IN CURRICULUM PROGRESS TO MEET KNOWLEDGE EXPLOSION

By

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ABSTRACT

The integration of technology throughout the curriculum is important to meet the needs of all learners of the 21st century. Technology can assistant teachers with the delivery of lessons and assessing students. It can also provide students with numerous ways to demonstrate their learning, increase engagement in the learning process, and help to meet the many learning needs of students within a classroom. As there are rapid changes in technology, it is difficult to identify expectations of specific sites, hardware or software that should be included in the written, taught, and tested curriculum. Curriculum provides medium of interaction between the teachers and the students. A teacher is expected to infuse successfully the knowledge of technology integration into his/her subjected area to make learning meaningful. Educational systems all over the world are changing rapidly due to knowledge explosion. So the present education should be readjusted and reshaped in keeping pace with different factors emerging today. This would lead the learners as lifelong learners. This presentation focuses on the uses of technology integration to frame the Curriculum. The written curriculum should encourage teachers to be co-learners or guides rather than the sole dispenser of knowledge with the students as the vessels to be filled. Even more traditional lessons can be enhanced with technology.

Keywords: Curriculum, Technology Integration, Curriculum Integration, Classroom, Curriculum Progress, Knowledge Explosion, Educational Technology, Technological Explosion, 21st Century Learning, 21st Century Expectations, E-Education, Information Technology, Evaluation.

INTRODUCTION

Process of curriculum development is essential for successful achieving of educational goals. Curriculum must stand on the Pillars of relevance and excellence besides a dynamic and meaningful curriculum. It has to be responsive to the needs and aspirations of the society also. As the needs and aspirations change, the curriculum must be revised on a regular basis to accommodate the changing issues and innovation. Technology is the making, modification, usage, and knowledge of tools, machines, techniques, crafts, systems, methods of organization, in order to solve a problem, improve a pre-existing solution to a problem, achieve a goal, handle an applied input/output relation or perform a specific function. It can also refer to the collection of such tools, machinery, modifications, arrangements and procedures. Technologies significantly affect human as well as other animal species' ability to control and adapt to their natural environments. Curriculum is the life line of every educational process not only derives it shape, identity and direction from educational objectives, but also reflect them. Any programme of professional preparation should fulfil the requirements and expectation the profession. Curriculum and technology are the important aspect to meet the knowledge explosion.

Technology

A scientifically and technologically literate person is one who can read and understand common media reports about science and technology, critically evaluate the information presented, and confidently engage in discussions and decision-making activities that involve science and technology. Technology and digital media are everywhere and integrated into every aspect of individuals' lives. Today's educators must provide students

with the skills they will need to excel in a technology-rich society. Parents no longer are urging schools to incorporate technology into the classroom; instead, they are insisting on it. When used appropriately, technology has the potential to enhance students' achievement and assist them in meeting learning objectives.

Integration

"An integration is one in which children broadly explore knowledge in various subjects related to certain aspects of their environment". He sees links among the humanities, communication arts, natural sciences, mathematics, social studies, music, and art. Skills and knowledge are developed and applied in more than one area of study (Humphreys, Post, and Ellis 1981).

Technology Integration

The goal of technology integration is to use technology seamlessly so that it becomes a transparent and integral tool to teach core curriculum. When computers and software are used students have new methods of learning curriculum and these tools can promote and enhance students' understanding of content in powerful ways. They can find information, collaborate with others and use images and sound as well as text to communicate what they have learned. It involves use of computers, computer software and other devices to convert, store process, transmit and retrieve information and include the service and applications associated with them. Technology integration is originally to serve as a means of improving efficiency in the educational process (Jones and Knezek, 1993). Furthermore Dede (1998) stated that the use of Technology integration in education can help improve memory retention, increase motivation and generally deepen understanding. Richardson (2009) argued that for effective Technology integration use in teaching and learning.

Curriculum

The term curriculum is a Latin word meaning "the course of a chariot race". According to Burton & McDonald (2001) it is difficult to provide a simple dictionary definition for this term because of its complex nature. Simply it can be considered as the list of topics taught in the school or in an institution. In wider view, it encompasses all the experiences that the student undergoes through while being part of that institution. Strength of the curriculum is beyond the written documents produced by the faculty.

"Curriculum is a tool in the hands of the artist (teacher) to mould his material (pupils) according to his ideals (aims and objectives) in his studio (school)".

In formal education, curriculum plays a very important role. Curriculum provides a medium of interaction between the teacher and the student. Different subject are included in the curriculum to impart comprehensive knowledge to the learner. The curriculum should be purposive and functional. So that it can attain the objectives of the profession.

Curriculum Progress

Curriculum progress can be imparted through activities such as conceptualizing, planning, implementing, field testing, and researching. These activities are helpful to produce new curricula or to improve existing ones.

The emerging curriculum responds to the urge to break away from traditional disciplines, to develop more interdisciplinary approaches. In the curriculum of the future, subject matter most likely will be less compartmentalized and more integrated and holistic. Although traditional subject boundaries will remain, there will be increased cross-subject material. Knowledge will no longer be considered fragmented or linear, but multidisciplinary and multidimensional. It will also be integrated with more visual and auditory resources and rely less on verbal and reading materials. Curriculum comprises of

- Defining of requirements for attending of teaching process from particular course
- Course content
- Class timetables of contact hours
- Learning and teaching methods
- Course credits and student workload
- Schedule of examinations, structure of examination
- Compulsory and optional course elements
- Details of each component course, include:

  Objectives, syllabus

  Assessment criteria, learning outcomes.

Curriculum Integration

Integrated curriculum is defined in the Dictionary of Education as "a curriculum organization which cuts across subject-matter lines to focus upon comprehensive life problems or broad based areas of study that brings together the various segments of the curriculum into meaningful association" (Good 1973).

Curriculum integration with the use of technology involves the infusion of technology as a tool to enhance the learning in a content area or multidisciplinary setting. Effective integration of technology is achieved when students are able to select technology tools to help them obtain information in a timely manner, analyze and synthesize the information, and present it professionally. The technology should become an integral part of classroom functions as accessible as all other classroom tools.

In the integrative curriculum, the planned learning experiences not only provide the learners with a unified view of commonly held knowledge by learning the models, systems, and structures of the culture but also motivate and develop learners' power to perceive new relationships and thus to create new models, systems, and structures (Dressel's, 1958). The integrated curriculum includes the following aspects:

- A combination of subjects
- An emphasis on projects
- Sources that go beyond textbooks
- Relationships among concepts
- Thematic units as organizing principles
- Flexible schedules
- Flexible student groupings
- Enhance the learning

Technology and the Curriculum

The integration of technology throughout the curriculum is important to meet the needs of all learners of the 21st century. Technology can assist teachers with the delivery of lessons and assessing students. It can also provide students with numerous ways to demonstrate their learning, increase engagement in the learning process, and help to meet the many learning needs of students within a classroom. As there are rapid changes in technology, it is difficult to identify expectations of specific sites, hardware, or software that should be included in the written, taught and tested curriculum. Technology should not only be considered, integrated, and included into the curriculum throughout the process; technology should also be used in the creation of the curriculum itself. The curriculum can indicate that the teacher use a document camera to project an article, book, or picture and offer suggestions on how to use the included software to take a photo or write on the image as the students discuss. Interactive whiteboards can improve student engagement and motivate students. The curriculum and the co-curriculum should provide numerous paths by which students can achieve broad liberal education outcomes alongside specialized knowledge of one or more disciplines.

Method Used

The observation method was used to identify the level of knowledge explosion through technology in teaching-learning process.

Protocol of this Paper

This paper first recognizes the present situation in knowledge explosion through integrated curriculum and the technology progress in teaching learning process. Then the authors observed all type of educational institutions to verify the importance given to the technology in the development of curriculum to meet the knowledge explosion. After knowing the present situation of technology in knowledge explosion (i.e., merits and demerits with technology in knowledge explosion) the authors finally gives the findings and the recommendations regarding the educational institutions about the current tendencies.

Elements of Curriculum

Curriculum in narrow view includes content and examination. In wider frame curriculum includes aims, learning methods and subject matter. Broader concept of curriculum describes it as a sophisticated blend of educational strategies, course content, learning outcomes, educational experiences, assessment, the educational environment and the individual students' learning style, personal timetable and the program of work Curriculum not only covers the formal teaching/learning

but also the other aspects of human development associated with institutional life. It will transform a student into a productive citizen. In the time of information explosion, the curriculum planners must not only decide what should be taught but also what can be eliminated from the curriculum, hence the need to define minimum essential knowledge and skills.

Harden said that a curriculum should be viewed not simply as an aggregate of separate subjects, but rather as a program of study where the whole is greater than the sum of the parts. Curriculum is the result of bringing together a number of elements, content, strategies and methods to ensure quality in education and excellence in performance, but should have a right mix of elements to ensure efficiency and to facilitate learning. While planning the curriculum the important components to be considered in educational organization are:

- Leadership and vision
- Context and culture
- Planning and management of change
- Lifelong process

Educational Technology

Educational Technology is the efficient organisation of any learning system adapting or adopting methods, processes, and products to serve identified educational goals. This involves systematic identification of the goals of education, recognition of the diversity of learners' needs, the contexts in which learning take place, and the range of provisions needed for each of these.

The challenge is to design appropriate systems that will provide for and enable appropriate teaching-learning systems that could realise the identified goals.

The key to meet this challenge is an appreciation of the role of educational technology as an agent of change in the classroom, which includes not only the teacher and the teaching-learning process but also systemic issues like reach, ability, equity, and quality.

Curriculum Ideas for Technology Integration

- Recording personal memoirs of images in iMovie or Photo story.
- Create a website or Google Site to compare embeds information, videos, images etc.
- Use primary source images from Library of Congress to create digital timeline.
- Design a radio program, practice reading poetry or language conversations using audacity.
- Use power point.
- Create a collaborative art presentation and share images.
- Collect data about an authentic issue and use data to influence decision making with blog.
- Use models and simulations to modify data for best results.
- Use a wiki or shared document to manage group projects.
- Write collaborative science labs.
- Use Google Maps to discuss and analyze how geography affects migration, population, etc.
- Use games or online simulations for role playing and decision making.

Technological Explosion

A very important factor impelling change has been the technological explosion, particularly in the area of ICT (Information and Communication Technologies). Such technologies are double-edged swords. They allow people to contact one another and exchange ideas very easily in order to create communities built around common interests and common causes. They also make it possible for global corporations to move billions of dollars around the world with the click of a button. This gives them tremendous power over local and national economies, especially the countries like India. With the profit motive reigning supreme, global corporations see human beings as consumers of their products and not as citizens with inalienable civic rights and duties. A by-product of this phenomenon has been the loss of diversity in the biosphere, in cultural mores, and the ways in which we live. The world is becoming increasingly homogenized.

Knowledge

The fact or condition of knowing something with familiarity

gained through experience or association: acquaintance with or understanding of a science, art, or technique (Merriam Webster).

Knowledge Explosion

The knowledge explosion is the worldwide accessibility of knowledge, which occurred after the age of reason and the discovery of the printing press. Before that time, books were hand-copied and only available in a few libraries. After the discovery of the printing press, knowledge was much wider available, and resulted in the age of reason, and a rapid accumulation of knowledge, more books, more readers, more writers, etc. One could say that with the internet there is a new boost to the knowledge explosion. A decade ago the knowledge base of humanity used to double every ten to twelve years but now it doubles every two to three years. It possible to weave knowledge in a multi-disciplinary fashion into questions those are of relevance and interest to the learners.

21st Century Learning

Continuous learning with clear purpose and connection to the real-world is critical to develop the capabilities, dispositions and literacies required to participate in society and to deal with the complexity of issues and change. Knowledge is situational, complex, diverse and rapidly changing. Learning is inquiry-focused, requiring application construction and creation of knowledge. Learners connect understandings across disciplines, applying key concepts and evaluating multiple solutions within ethical frameworks. This requires high levels of personalization and collaboration.

Innovative Application of Technologies in 21st Century Learning

- Personalization
- Negotiation and risk-taking
- Critical, creative and reflective thinking
- Problem solving
- Knowledge creation and management
- Interactivity
- Communication and collaboration
- Local and global networks
- Motivation and learner expectations
- Assessment

21st Century Expectations

Changes in the larger society over the last 100 years are vast with various social movements, the advent of telecommunications, move from industrial-based to knowledge-based work, struggles over political boundaries, modern technology and science break through employed in both the most positive and most negative of circumstances. Colleges and universities in the 21st century educate a much larger, more diverse population of students, foster scholarship countless new areas of inquiry, and offer opportunities in many new settings and formats, including online. To better meet individual and societal needs of the 21st century the missions and practices of the 20th century needed to be reinvigorated.

Electronic Education (E-Education)

The e-education is rich, engaging, and purposeful with multi-layered teaching and learning strategies. We increase the use of multiple technologies to learn more about the subject matter. The advent of video technology has made available another valuable tool for instruction. Videotapes, cassettes, and disks can be used for instruction in classrooms, libraries, resource centers, and the student's home. Since the video can be played at any convenient time, the students never have to miss a lesson. Many school systems have begun to produce their own videos for specific instructional purposes. With the help of a video-printer, individual images from the screen-photographs, tables, graphs, or any other picture can be printed on paper for further study.

Opportunities for Building Information Skills into the Curriculum

At every level of the school, curriculum decision-making should take into account students' needs and skill development. A consideration of information can be built into the agendas and activities of

- Curriculum and other school-wide committees
- The school executive group
- Faculty/grade groups

- Individual classroom teachers
- Individual specialist teachers
- The teacher librarian

Information Technology

In different ages people used different materials and methods for communication such as rocks and stones, papyrus, palm leaves, animal leather and handcrafted manuscripts for storing and transmitting the information from one place to another and to the next generation. These means of information were limited and confined to the elites but "the advent of printing enabled information to be truly wide spread throughout the world to move to amore equitable level in terms of access to knowledge" (Menon, B., 2000). Information encompasses and relies upon the use of different communication channels or technologies called information technologies, for its effectiveness and equal access.

Area of Knowledge Explosion

- Media revolution
- Learning in real situation
- Cooperative and collaborative learning
- Self-learning habits
- Inquiry-learning habits
- Review and explore qualitative data
- More interesting and attractive content

Integrated Technology in Classroom

A classroom that has successfully integrated technology into the curriculum would be one where you would not really notice. The teacher would not have to think up ways to use whatever tools were available, but would seamlessly use them to enhance the learning of whatever content was being covered. Technology is used to acquire content knowledge, and the acquisition of technology skills. Integrating technology into classroom instruction means more than teaching basic computer skills and software programs in a separate computer class. Effective technology integration must happen across the curriculum in ways that research shows deepen and enhance the learning process. In particular, it must support four key components of learning i.e., active engagement, participation in groups, frequent interaction and feedback, and connection to real-world experts. Effective technology integration is achieved when the use of technology is routine and transparent and when technology supports curricular goals.

Many people believe that technology-enabled project learning is the ultra means of classroom instruction. Learning through projects while equipped with technology tools allows students to be intellectually challenged. Through projects, students acquire and refine their analysis and problem-solving skills as they work individually and in teams to find, process, and synthesize information they have found online.

Role of the Teacher in Technology Integration

A teacher using technology in the classroom instructions don't need to know how a computer works but rather how to use and apply a computer in the classroom. Teachers should strive for two goals when integrating technology. The first goal is to become a computer-using teacher and it includes the producing materials to use in the classroom such as handouts, banners or newsletters. It may be using the computer to manage your students' marks or using a software program to strengthen a particular skill. The second goal is to make the computer a teaching partner rather than an object of study. "The instructional goals of computer using teachers are in art, science, math, language arts, social studies, or other disciplines, not in computers." Geisert & Futrell, 1995.

Characteristics of Technology Integration

Some important characteristics of technology integration are given below

- Effectiveness involves most Interactive, Customized, Transparent and Searchable.
- Efficiency involves faster, cheaper, lower costs, less people, less paper and less work.
- Innovation involves new products and new techniques.

Need of Technology Integration in Curriculum

All over the world, Education system change the curriculum due to knowledge explosion. Knowledge assimilation and dissemination are becoming easy with the recent advances in computers and telecommunication. A

teacher is expected to infuse successfully the knowledge of technology integration into his/her subject area to make learning meaningful. This knowledge development during pre-service training has gained much importance with the nation that exposure to technology during this time is helpful in increasing student teachers willingness to integrate technology for classroom teaching. Computers, mobile devices, i-pad, i-phone, digital students, digital citizenship, e-portfolio, online, e-book reader, e-learning, e-textbook, internet media literacy, virtual learning, m-learning, web-blender, satellites, videoconferencing etc. are some of the integrated technologies used in the knowledge explosion.

New Situations-New Demands

In the present trend the knowledge explosion with the help of technology is the effective and efficient and it is possible at all levels. Content-centered presentation by teachers to large groups of students cannot have any justification to be dominant method of instruction. In this era of technology, teachers will be spending more time in facilitating students rather delivering lectures in the classrooms. They would be working in groups, preparing and evaluating instructional materials and organizing data into meaningful information and accessible forms. They will be spending their time in coaching students, helping them to learn through reviewing the huge information.They will be offering group presentations. Presentations will not be used to provide new information instead, presentation will be carefully constructed to model and answer existing questions and solve current problems in certain disciplines. These are helpful to make explosion in the knowledge among students (Menges, 1994).

Evaluation of Curriculum

Evaluation of curriculum presents the final stage inside cyclic process of improvement and development of curriculum. Without evaluation procedure it would be hard to imagine monitoring of institution progress toward desired needs. This process is necessary to provide the evidence that institution made a step in the right direction, as well as useful information to stakeholders. It helps in the process of identification of problems inside curriculum and institution, solving of problems and redesigning of certain aspects of curriculum. Evaluation can be performed as short-term and long-term evaluation. It is very important to carefully define the appropriate time for evaluation for each of these areas as well as the methods for its measuring. Evaluation will only have full meaning if it is followed by action in order to improve areas which are estimated as weak points of curriculum.

Aspects of Curriculum Evaluation

- Psychological and interpersonal skill
- Continuing learning
- Professional satisfaction
- Practice behaviour
- Educational achievement and cognitive development
- Institutional issues
- Student passing rates
- Problem solving
- Educational cost per student

Principles for Integrating Technology in Curriculum

- Encourage contact between students and faculty.
- Develop reciprocity and cooperation among students.
- Encourage active learning.
- Give prompt feedback.
- Emphasize time on task.
- Communicate high expectations.
- Respect diverse talents and ways of learning.

Findings

The findings of this paper show that the technology integration in curriculum is a new contribution to the progress of teaching and learning process in the Indian classrooms. The curriculum takes an important position in the teaching and learning process to explore the knowledge. The results reveal that the technological approach can be introduced to the educational institutions for the betterment of the students' command over the subject and for the development of their knowledge. It is apparent that educational technology has the pedagogical strength and it fosters easy learning and better understating and helps to hold the power of retention for a long period and hence the authors likes to

recommend educational clients to introduce this innovative and effective technology in all the educational institutions.

Recommendations to the Educational Institutions

The educational institutions should produce proficient and effective teachers in all subjects taught in their institution. They should appoint teachers and teacher educators with high proficiency in technology apart from adequate qualification. They should provide broad teaching strategies with the help of educational technology. They should bestow sufficient training to the teachers and teacher educators in utilizing the technology equipment. They should conduct special programmes on educational technology involved teaching methodologies for teacher educators and prospective teachers as well. Technology for teacher educators and their wards, in which they may be taught how to prepare for a power point presentation, how to edit a picture or an audio-video clip which is relevant or suitable for teaching, how to frame the units, how to make use of hyperlinks, how to do movie makers, and how to generate effective pictures, animations, graphics and so on. The Management of the institutions must provide adequate infrastructure to establish a well-equipped educational technology lab which should never be seen only headphones, CD players and dusted and outdated devices but with plenty of electronics materials, learning software, internet facilities and so on. The management should update the lab time according to the needs of the present day education.

Conclusion

Education must enable individuals to discover what they need to know rather than just having static knowledge. New technologies enhance our ability to create new ideas, make discoveries, prove our theories, test our knowledge and realize our dreams like never before. The institutions need Intelligent, connected, adaptive environments and pervasive infrastructures. Emergence of technology influenced every movement of human life including education with the use of technology based instruction. The trend of integrating technology components in curriculum is needed for the existing demands of knowledge explosion. In the same way the teacher should be trained to meet the challengers of 21st century. The Net Generation and the current capabilities of technology make it possible to support learning activities that will enable graduates to be mentally agile and adaptable.

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