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Lesson No.

1.1 : Information and Communication Technology (ICT)

1.2 : Integration of ICT in Teaching and learning Role and Challenges of ICT

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INFORMATION AND COMMUNICATION TECHNOLOGY (ICT)

Structure of the Lesson

1.1.1 Objectives

After going through this lesson learners will be able to:

i. recall the concept of Information Communication Technology.
ii. know the meaning of Information Communication Technology.
iii. list the characteristics of Information Communication Technology.
iv. describe the importance of Information Communication Technology.
v. List the limitations of information communication Technology.

1.1.2 INTRODUCTION

ICTs stand for information and communication technologies and are defined, for the purposes of this primer, as a "diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information." These technologies include computers, the Internet, broadcasting technologies (radio and television), and telephony.

In recent years there has been a groundswell of interest in how computers and the Internet can best be harnessed to improve the efficiency and effectiveness of education at all levels and in both formal and non-formal settings. But ICTs are more than just these technologies; older technologies such as the telephone, radio and television, although now given less attention, have a longer and richer history as instructional tools. For instance, radio and television have for over forty years been used for open and distance learning, although print remains the cheapest,most accessible and therefore most dominant delivery mechanism in both developed and developing countries. The use of computers and the

Internet is still in its infancy in developing countries, if these are used at all, due to limited infrastructure and the attendant high costs of access.
Moreover, different technologies are typically used in combination rather than as the sole delivery mechanism. For instance, the Indira Gandhi National Open University in India combines the use of print, recorded audio and video, broadcast radio and television, and audio conferencing technologies. In fact, modern ICT have created a "Global Village" as people can communicate to each other as if they were living next door.

1.1.3 MEANING AND DEFINITIONS OF ICT

In past few decades, information and communication technologies have provided with a variety of new communication capabilities. For example people can communicate with others in different countries using technologies such as instant messaging, video-conferencing and other social networking websites like Facebook which allow users from all over the world to remain in contact and communicate regularly.

According to UNESCO, "Information and Communication Technology (ICT) is scientific, technological and engineering disciplines and the management techniques used in information handling and processing, their application, computers and their interaction with man and machines and associated social, economic and cultural matters."

According to OECD view, "the term 'Information and Communication Technology' is used to cover technologies used in the collection, processing and transmission of information. It includes micro- electronic and info- electronic based technologies incorporated in many products and production processes and increasingly affecting the service sector. It covers interalias computers, electronic office equipment, telecommunication, industrial robots and computer controlled machine, electronic components and software products."

According to Smith and Cambell's view,"A mosaic of technologies, products and techniques has combined to provide new electronic dimensions to information management. The mosaic is known by the name of Information and Communication Technology."

From the above mentioned definitions, it is clear that the term Information and Communication Technology deals with information system, creation, data collection, data storage, access, processing, retrieval, analysis, use and dissemination of information accurately and effectively for the purpose of enriching the knowledge and developing intelligent decision- making as well as problem- solving ability of the user.

It is pertinent at this stage that we make efforts to understand the relationship of all the components of information techniques (theory, techniques and technologies) and components of communication technologies theory, techniques and technologies into synergic form, that is, looking at holistic structure with enhanced effect with a reason that:

- It deals with information and knowledge.

- It is related with techniques for creating, collecting, retrieving and classifying information.
- Evolving new technologies to capture and utilize expanding information and knowledge.
- Its focus from educational perspective is content, curriculum and related aspects whereas CT deals with transmission of information and knowledge.
- It is related with techniques of communication, transmission and receiving the same at both verbal and non-verbal level.
- It also deals with one's ideas, emotion, values, skills and attitudes of people. The focus is receiving other's ideas, intentions, and perceptions through variety of messages (at different levels of communication).
- Evolving new technologies of learning, communication, filtering relevant information (intended & unintended) in a context and situation.
- In educational perspective, working out new tools and technologies based on theories of learning, motivation, emotional & mental intelligence, social psychology with reference to one's traditions, cultural values and attitudes. Here teacher's focus is level & type of instructional communication and evolving the learner to assimilate the content in his psychological repertoire.
- It also deals with one's elevation and ignition of higher human consciousness (divinity) through interaction. It may be face-to-face or virtual classroom or online.

In this background, the synthesis or integration of the technologies with regard to information and communication with a view to cover a large population which is geographically dispersed in a country like India will have to be seen and applied for quality education at different levels of education system.

1.1.4 CHARACTERISTICS OF ICT: The characteristics of ICT as follows:

i. **Student-centric**: In ICT enable classrooms, students play an active role in their learning and teachers serve as mere guides. They are more facilitators of learning than lecturers. They help students think critically and learn by doing and act as a resource while their students discover and master new concepts. Student-centric classroom environments put students' interests first and are focused on each student's needs, abilities and learning styles.

ii. **Computing devices**: Computers, since they are essential tools for 21st century students and replace the utilities of pen and paper. They not only give students the means to conduct online research and master the technology skills they need, but they also give teachers the opportunity to enhance their lessons. The ability to deftly operate a computer is a critical 21st century skill. Computing

devices greatly assist in teaching and learning and make them more engaging and effective.

iii. **Active learning**: In modern classrooms, students are actively engaged in what they learn. Students participate in more active learning by working in groups or on computers and complete projects and other interesting activities that help them discover new skills. Students can learn actively by talking and listening, writing, reading and reflecting. When students are encouraged to take an active interest in learning, they are more likely to retain the knowledge they've accumulated.

iv. **Adaptive learning**: ICT fulfills the needs of different types of learning abilities which often makes it difficult for teachers to make sure that all of them understand the concepts. The modern approach of adaptive learning gives students the freedom to learn at their own pace and in the way they are most comfortable with. There are various kinds of software available for adaptive learning that teachers can use to enhance the learning of their students.

v. **Invitational environment**: ICT helps in breaking the cramped or overcrowded classrooms. Modern classrooms should have the basic material required for teaching such as, interactive whiteboards and LCD projectors. The BYOD (Bring-Your-Own-Device) approach can be adopted, so that students can bring their laptops or tablets to the classroom for better personalized learning. Teaching with technological material is more effective, stimulates student engagement, eases the work of teachers and makes it easy for students to focus on learning.

vi. **Mutual respect**: ICT makes teachers and students relationship cordial. As now the role of teachers is no longer to be the sage on the stage, students should not forget their value as they will always receive guidance from them. Also, teachers should encourage students to speak with confidence and value their opinions. In a well-disciplined environment, students should also co-operate with and respect their classmates.

vii. **Students take responsibility of their learning**: ICT encouraged students to take active participation in their own learning; they become responsible for their learning. Self-directed students not only encourage each other, but also work with their teacher to achieve academic and behavioral goals that they themselves have helped establish. Teachers should employ a variety of strategies to promote responsible decision-making and create self-reliant students.

viii. **Collaborative learning**: Learning through ICT is one of the most effective forms of learning. Teaching and learning in isolation are very restrictive and hinder progress. Learning in groups enhances the scope of learning and develops critical thinking. Collaborative learning activities include

collaborative writing, group projects, joint problem solving, debates and more. Collaborative learning redefines traditional student-teacher relationship in the classroom.

Some other characteristics:

- Motivate the learners
- Provide greater and deeper understanding of the subject matter
- Improve designing skills in developing course materials.
- Develop critical thinking and reasoning in learners through networks.
- Enhance better social interaction through networks which is otherwise not possible in traditional teaching environment.
- Develop self-confidence and reliance through participation and actually performing practically.
- Encourage innovations and research while searching alternatives for quality performance.
- Provide personalized learning.
- Give both interactive learning along with fun or recreation.
- Help under achievers to achieve more without affecting their self-esteem.
- Re-engage disengaged learners
- Develop powers of comprehension, expression, speed decision making and vocabulary.
- Develop qualities like tolerance, risk taking, scientific temper.

1.1.5 IMPORTANCE OF ICT

The information and communication technology in fact have brought revolution in the field of business, postal banking, telecommunication etc. They have fundamentally changed the way we think, the way we communicate and the way we do most of the things in our life. The field of education is no exception. We can summaries the importance of ICT in the field of education in two different ways namely (A) Importance to the people connected with education and (B) Importance in revolutionizing the system of education.

1.1.5.1. A Importance to the people connected with education

1. **Useful for the students.** Students may get required opportunities and training for receiving and using information for their self- improvement. It may help them to satisfy their urges of curiosity, inventiveness, construction etc. They get acquainted with the relevant sources of information, the ways and means of extracting required information and methods of information processing etc. The training received in proper decision making and problem solving ability makes them able to bring necessary changes in their behavior. It also helps them to get self-paced

auto instruction related to the curricular and non-curricular areas of education. The precision, speed and accuracy in receiving, transforming and communication is well acquired through the ICT, as they become acquainted and trained for handling well the sophisticated electronic appliances, software and techniques used for information and communication purpose.

2. **Useful for the teachers.** Teachers get sufficient help from ICT in their task of teaching. Their acquaintance with the relevant source of information in the form of books, journals and other reading- material, audio- visual material, equipment, electronics and telecommunication media make them able to acquire necessary teaching material and techniques. Programmed learning material, self- learning modules, teaching machines and computers may help them much in this direction.
3. **Useful for counselors.** The counselors working in schools and outside the schools in the community can be greatly benefitted through ICT. They can have proper access to have proper access to the various sources of information through information technology. Use of ICT can enable them to communicate and interact well with their clients for providing desired educational, vocational and personal guidance as well as counseling to the students along with their parents.
4. **Useful for the educational administrators and planners.**ICT may help the educational administrators and planners in the task of exercising their professional responsibilities in an appropriate way. On the one hand, it makes them well informed regarding the development in the field of education, educational administration and planning and on the other hand, they can have proper access to the information data regarding the functioning of the institution, working of the teachers, achievements of their students and other personnel.
5. **Useful to the educational researchers.** The students of education desirous to undertake research projects in the field of education are greatly benefitted through the processes and products of ICT. They need quite diversified, pinpointed and reliable information and this need can be properly fulfilled through the organized sources of information controlled through information technology.

   In this way, ICT may prove quite useful in helping all the personnel connected directly or indirectly with the processes and products of education.

1.1.5.2. A Importance in revolutionizing the system education. The use of ICT has great potential in revolutionizing the formal and non- formal system of education in a number of ways like below.

1. It can help in a big way to bring the existing educational systems in to alignment with the knowledge based information- rich society by providing the services of sophisticated tools, techniques and methods at its disposal.
2. The use of ICT has great potential in bringing a paradigm shift in the traditional views and methods of teaching- learning and instruction in the manner given below.

- It can help in the process of transitioning from broadcast model of learning to interactive learning. As a result it can ensure that students are able to work actively in the knowledge getting processes going inside the classroom collaboratively along with their peers.
- The use of ICT has enabled students to become more self-reliant and self-directed in the acquisition and application of knowledge and skills as needed on their part for coping up the modern era. With the assistance of ICT now students are able to get exposed through large amount of information and opportunities for +collaborating with other in accomplishing complex tasks and effectively communicating knowledge to others.
- The potential of ICT in shifting emphasis from teaching to learning has helped in creating a more interactive and engaging learning environment for both the learners and teachers and thus make the teaching- learning process as a quite cooperative enterprise and challenging pursuit for the realization of the common goals in an interesting and purposeful way.
- It can help in bringing a necessary shift in the role of the teacher from a mere knowledge transmitter to that of learning facilitator, knowledge guide, knowledge navigator and an active co- learner along with his students.

3. ICT can properly infused into the entire teacher education programme (both pre-service and in- service) not only to help them using it for their own education and training but learning to use it creatively and constructively for fastening the educational growth of their students and playing the role of an effective teacher as demanded by the ICT ruled modern society

1.1.6 Limitations of ICT

In every process, innovation, technology there are two aspects, that is, advantages and limitations. No doubt ICT related technologies-information and communication has vast potential to boost up or increase the scope of learning and enhance the capacity of a learner but it has some limitations. These limitations are confined to certain factors like resources, infrastructure, man power, trained professional, and other aspects. Some of the limitations in a growing economy of our country are as under:

1. Proper infrastructure is not available in Indian Schools.
2. Resources are quire meager for large school population.
3. Technically trained personnel are not available to handle ICT related teaching and learning.
4. Courseware designers/e-content developers are not available.
5. Power supply especially in rural and remote areas is not available as per the requirement and during school time.
6. Administrators / Heads of educational institutions lack innovations to make ICT effective.
7. Adequate workshops are not available where maintenance of hardware can be done.

1.1.7Summary

This unit discusses the meaning, characteristics and importance of Information and Communication Technology.ICT is the combination of technological tools and resources to create, disseminate, store and manage data and information and to be applied in education.ICT can be used in educational institutions either as an application or as a subject or it is integrated in the total education system subject to the realization of goals, resources available and situation demands.Alongwith latest developments in ICT and its effect on education, thinkers, scholars, researchers, teacher educators, practitioners and stake holders will have to envisage the type of schools and teacher education institutions. Last but not the least, in this process of evolution and process of ICT human touch may not be lost. A human cultured civil society is to be established.

1.1.8 Suggested Questions

1. What do you mean by the term Information and Communication Technology? Explain the concept clearly**.**
2. Discuss educational importance of Information and Communication Technology.
3. Write a note on characteristics of Information and Communication Technology**.**
4. What are the limitations of information and communication technology?

1.1.9. Suggested Reading

Carnoy, Martin(2005). ICT in Education: Possibilities and Challenges.UniversitatOberta de Catalunya,.

Denning, T. & Fisher, T. (2002).Exploring the Characteristics of Effective ICT Teaching. In D. Willis, J. Price & N. Davis (Eds.),Proceedings of Society for Information Technology & Teacher Education International Conference.

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Integration of ICT in Traching and Learning Role and Challenges of ICT

Structure of the Lesson

1.2.1 Objectives

After going through this lesson learners will be able to:

i. Recall the role of Information Communication Technology in teaching learning process.
ii List the role of Information Communication Technology in teaching learning process.
iii Describe the Information Communication Technology in teaching learning process.
iv Know the Challenges in Integrating ICTs in School Education.
v Explain various Challenges in Integrating ICTs in School Education.

1.2.2 Introduction

ICT has put its effect on every sphere of life. ICT is shrinking the whole world to a desk. All this is happening just due to the large number of advantages of ICT in every field.
ICT is also helping in the field of education. The role of ICT are for each person who is connected to the process of education directly or indirectly.

1.2.3 Role of Information Technology in Teaching Learning Process

i. **Helps is easy communication:** Using ICT the students can communicate with their teachers, classmates, friends, and other related person in an easy and quick

way. The quick communication helps the students to learn more quickly and increase the quality of learning.

ii. **High quality of teaching:** ICT helps the teacher to maintain a high quality of teaching. the teachers can communicate with their students in easy, attractive and effective way using ICT.

iii. **Easy retrieval of information:** using different ways of ICT the students can gather the information from all around the world within few seconds. Thus this information helps in learning and students remain in touch with the latest what's going on in education.

iv. **Searching the content:** the concepts of online library, e-books, etc. help the students and teachers to search the related material to their syllabus far away from their place of living.

v. **Expert guidance:** the teachers and students can avail the guidance of expert person of their field, using ICT and use them in their teaching.

vi. **Works as assistant:** ICT works as an teaching assistant to a teachers as well as students. They get the help of hardware and software to make his functions better and better.

vii. **Vocational guidance:** getting into right job is one of major problems raised during entrance to job. ICT helps to have proper knowledge of educational opportunities all round the world.

viii. **Effective Presentation:** ICT helps to present the information in an effective way. Certain hardwares and softwares help the student and teacher to information in an attractive way.

ix. **Better editing of information:** the gathered information using previously mentioned techniques can be easily edited and thus can be given the desired form.

x. **Economical:** ICT is an economical way to disseminate information and communicate with other. It saves time, money and energy of the students.

xi. **Latest information:** students and as well teachers remain in touch with the latest information regarding their study using ICT techniques and take the benefits of it in their educational activities.

xii. **Promote self learning:** ICT helps to develop a habit of self learning by taking them near to the education world and making their activities easier.

xiii. **Motivate to the students:** the use of ICT makes the teaching effective and this creates the interest of the students in the study and they get a motivation from their teacher work.

xiv. **Minimization of repetitive activities:** there are certain activities which are repeated during teaching and educational process. Using ICT such types of activities can be conducted without repetition. These activities may include quiz, exams, evaluation etc.

xv. **Quick decision making:** Easy quick and adequate access of information helps the administrator to make his decision quick and effective.

xvi. **Record Keeping:** There are certain records and information which are needed to be properly recorded. So that it can be easily and quickly retrieved whenever needed. ICT helps them to have proper recording of such information. This information may include confidential information also.

xvii. **Improvement of system:** it has been seen that the use of ICT is improving the education system and its sub parts. It helps the better communication between different components and better exchange of information among them. Thus improving the functioning of teaching learning process.

1.2.4 Key Challenges in Integrating ICTs in School Education

Although valuable lessons may be learned from best practices around the world, there is no one formula for determining the optimal level of ICT integration in the educational system. Significant challenges that policymakers and planners, educators, education administrators, and other stakeholders need to consider include educational policy and planning, infrastructure, language and content, capacity building, and financing.

1.2.4.1. Implications of ICT-enhanced education for educational policy and planning

Attempts to enhance and reform education through ICTs require clear and specific objectives, guidelines and time-bound targets, the mobilization of required resources, and the political commitment at all levels to see the initiative through. Some essential elements of planning for ICT are listed below.

- A rigorous analysis of the present state of the educational system. ICT-based interventions must take into account current institutional practices and arrangements. Specifically, drivers and barriers to ICT use need to be identified, including those related to curriculum and pedagogy, infrastructure, capacity-building, language and content, and financing.
- The specification of educational goals at different education and training levels as well as the different modalities of use of ICTs that can best employed in pursuit of these goals. This requires of the policymaker an understanding of the potentials of different ICTs when applied in different contexts for different purposes, and an awareness of priority education needs and financial and human resource capacity and constraints within the country or locality, as well as best practices around the world and how these practices can be adapted for specific country requirements.
- The identification of stakeholders and the harmonizing of efforts across different interest groups.
- The piloting of the chosen ICT-based model. Even the best designed models or those that have already been proven to work in other contexts need to be tested on a small scale. Such pilots are essential to identify, and correct, potential glitches in instructional design, implement ability, effectiveness, and the like.

- The specification of existing sources of financing and the development of strategies for generating financial resources to support ICT use over the long term.

1.2.4.2 Infrastructure-related challenges in ICT-enhanced education

A country's educational technology infrastructure sits on top of the national telecommunications and information infrastructure. Before any ICT-based programme is launched, policymakers and planners must carefully consider the following:

- In the first place, are appropriate rooms or buildings available to house the technology? In countries where there are many old school buildings, extensive retrofitting to ensure proper electrical wiring, heating/cooling and ventilation, and safety and security would be needed.
- Another basic requirement is the availability of electricity and telephony. In developing countries large areas are still without a reliable supply of electricity and the nearest telephones are miles away. Experience in some countries in Africa point to wireless technologies (such as VSAT or Very Small Aperture Terminal) as possible levers for leapfrogging.. [74] Although this is currently an extremely costly approach, other developing countries with very poor telecommunications infrastructure should study this option.
- Policymakers should also look at the ubiquity of different types of ICT in the country in general, and in the educational system (at all levels) in particular. For instance, a basic requirement for computer-based or online learning is access to computers in schools, communities, and households, as well as affordable Internet service.

In general, ICT use in education should follow use in society, not lead it. Education programs that use cutting-edge technologies rarely achieve long term success:

> It is cheaper, and easier, to introduce a form of technology into education, and keep it working, where education is riding on the back of large-scale developments by governments or the private sector. Television works for education when it follows rather than precedes television for entertainment; computers in schools can be maintained once commercial and private use has expanded to the point where there is an established service industry.

1.2.4.3 Challenges with respect to capacity-building

Various competencies must be developed throughout the educational system for ICT integration to be successful.

Teachers: Teacher professional development should have five focus: 1) skills with particular applications; 2) integration into existing curricula; 3) curricular changes related to the use of IT (including changes in instructional design); 4) changes in teacher role(5) underpinning educational theories. [76] Ideally, these should be addressed in pre-service teacher training and built on and enhanced in-service. In some countries, like India, teaching accreditation requirements include training in ICT use. ICTs are swiftly evolving technologies, however, and so even the most ICT fluent

teachers need to continuously upgrade their skills and keep abreast of the latest developments and best practices.

While the first focus—skills with particular applications—is self-evident, the four other focus are of equal, if not ultimately greater, importance. Research on the use of ICTs in different educational settings over the years invariably identify as a barrier to success the inability of teachers to understand why they should use ICTs and how exactly they can use ICTs to help them teach better. Unfortunately, most teacher professional development in ICTs are heavy on "teaching the tools" and light on "using the tools to teach."

Teacher anxiety over being replaced by technology or losing their authority in the classroom as the learning process becomes more learner-centered—an acknowledged barrier to ICT adoption—can be alleviated only if teachers have a keen understanding and appreciation of their changing role.

Education administrators: Leadership plays a key role in ICT integration in education. Many teacher- or student-initiated ICT projects have been undermined by lack of support from above. For ICT integration programs to be effective and sustainable, administrators themselves must be competent in the use of the technology, and they must have a broad understanding of the technical, curricular, administrative, financial, and social dimensions of ICT use in education.

Technical support specialists: Whether provided by in-school staff or external service providers, or both, technical support specialists are essential to the continued viability of ICT use in a given school. While the technical support requirements of an institution depend ultimately on what and how technology is deployed and used, general competencies that are required would be in the installation, operation, and maintenance of technical equipment (including software), network administration, and network security. Without on-site technical support, much time and money may be lost due to technical breakdowns.

In the India, for example, one of the major obstacles to optimizing computer use in high schools has been the lack of timely technical support. In some extreme cases involving schools in remote areas, disabled computers take months to be repaired since no technician is available in the immediate vicinity.

Content developers: Content development is a critical area that is too often overlooked. The bulk of existing ICT-based educational material is likely to be in English or of little relevance to education in developing countries (especially at the primary and secondary levels). There is a need to develop original educational content (e.g., radio programs, interactive multimedia learning materials on CD-ROM or DVD, Web-based courses, etc.), adapt existing content, and convert print-based content to digital media. These are tasks for which content development specialists such as instructional designers, scriptwriters, audio and video production specialists, programmers, multimedia course authors, and web-developers are needed. Like

technical support specialists, content developers are highly skilled professionals and are not, with the exception of instructional designers, historically employed by primary and secondary schools. Many universities with distance education programs, and those who otherwise make use of ICTs, have dedicated technical support and content development units.

1.2.4.4 Challenges need to be addressed in the areas of language and content

English is the dominant language of the Internet. An estimated 80% of online content is in English. A large proportion of the educational software produced in the world market is in English. In India where English language proficiency is not high, especially outside metropolitan areas, this represents a serious barrier to maximizing the educational benefits of the World Wide Web.

Even in countries where English is a second language (such as India) it is imperative that teaching and learning materials that match national curriculum requirements and have locally meaningful content, preferably in the local languages, be developed. This would ensure that the Web is a genuinely multicultural space and that peoples of different cultures have an equal stake and voice in the global communities of learning and practice online. Particularly vulnerable to exclusion of this sort are isolated, rural populations, cultural minorities, and women in general. Thus attention must be paid to their special needs.

One encouraging trend has been the emergence of national and regional school networks, or School Nets, that facilitate the sharing of content and information—curriculum guides, teaching and learning resources, telecollaborative project registries, school and teacher directories, training curricula and materials, research and policy papers, technology management guides, and start-up toolkits, among others

In Web-based learning, technical standardization of content has also become a pressing issue. Standardization allows different applications to share content and learning systems. Specifications in content, structure, and test formats are proposed so that interoperability may exist between different management systems, resulting in some cost-efficiencies. Standards must be general enough to support all kinds of learning systems and content.

While some schools and universities may already have agreements that expressly authorize the use of certain materials for classroom purposes, these agreements may not be broad enough to accommodate telecommunications transmission, videotape recording, or the distribution of course-related materials beyond the classroom setting.

1.2.4.5 Challenges related to financing the cost of ICT use

One of the greatest challenges in ICT use in education is balancing educational goals with economic realities. ICTs in education programs require large capital investments and developing countries need to be prudent in making decisions about what models of ICT use will be introduced and to be conscious of maintaining economies of scale. Ultimately it is an issue of whether the value added of ICT use offsets the cost,

relative to the cost of alternatives. Put another way, is ICT-based learning the most effective strategy for achieving the desired educational goals, and if so what is the modality and scale of implementation that can be supported given existing financial, human and other resources?

Why suggests the following potential sources of money and resources for ICT use programs:

1. Grants
2. Public subsidies
3. Private donations, fund-raising events
4. In-kind support (e.g., equipment, volunteers)
5. Community support (e.g. rent-free building)
6. Membership fees
7. Revenues earned from core business:

- Connectivity (phone, fax, Internet, web pages)
- Direct computer access to users
- Office services (photocopying, scanning, audiovisual aids

8. Revenues earned from ancillary activities:

- Business services (word-processing, spreadsheets, budget preparation, printing, reception services)
- Educational services (distant education, training courses)
- Community services (meeting rooms, social events, local information, remittances from migrant workers)
- Telework and consulting
- Specialized activities (telemedicine)
- Sales (stationery, stamps, refreshments, etc.)

Private sector-public sector partnerships to either pilot or fast track ICT-based projects is a strategy that has gained currency among Ministries of Education in developing countries. These partnerships take many forms, including private sector grants with government counterpart contributions, donations of equipment and education-related content by corporations to state-run schools, and the provision of technical assistance for planning, management, and strengthening human resources at the grassroots level. Multilateral organizations and international aid agencies have also driven many of the most significant ICT in education efforts in the developing world.

But the financial litmus test of ICT-based programs is survival after donor money has run out. Many ICT-based education programs funded by aid agencies or by corporations could not be sustained because government failed to step in with the necessary financing; nor were the local communities in a position to generate the resources needed to continue these programs. Therefore, a two-fold strategy is key: government support and local community mobilization

1.2.5. Summary

If there is one truism that has emerged in the relatively brief history of ICT use in education, it is this: It is not the technology but how you use it! Put another way: "How you use technology is more important than if you use it at all. Unless our thinking about schooling changes along with the continuing expansion of ICTs in the classroom then our technology investment will fail to live up to its potential."

Technology then should not drive education; rather, educational goals and needs, and careful economics, must drive technology use. Only in this way can educational institutions in developing countries effectively and equitably address the key needs of the population, to help the population as a whole respond to new challenges and opportunities created by an increasingly global economy. ICTs, therefore, cannot by themselves resolve educational problems in the developing world, as such problems are rooted in well entrenched issues of poverty, social inequality, and uneven development. ICTs as educational tools can do, if they are used prudently, is enable developing countries to expand access to and raise the quality of education. Prudence requires careful consideration of the interacting issues that underpin ICT use in the school—policy and politics, infrastructure development, human capacity, language and content, culture, equity, cost, and not least, curriculum and pedagogy.

1.2.6 Suggested Questions

1. Explain the role of information communication technology in teaching learning process.
2. Discuss key challenges in integrated ICTs in school education.
3. How ICT enhanced the School Education?

1.2.7 Suggested Reading and Web Resources

Carnoy, Martin(2005). ICT in Education: Possibilities and Challenges. Universitat Oberta de Catalunya,.

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