

Unit-One (1)

Meaning of ICT and ICT Education

ICT stands for information & communication technology. These technologies include:

- *computers,*
- *the Internet,*
- *Broadcasting technologies (radio and television),*
- *Telephony*

ICT is a very broad expression. It is not limited to the computers or the internet. Today ICTs are widely used in every aspect of human life like education, business, defence, communications, industries, offices, transportation, home, medical etc. The information and communication technology has brought revolutions in almost all areas.

Our life and all the areas of our society have directly or indirectly affected by ICT. Without ICT, any business in the world may not achieve its goal as desired. The success of the business and other organizations depends on the ICT. Thus, it has been the backbone of small organizations to large enterprises. The impact of ICT on our lives is a huge question which cannot be completely answered, and is a matter for discussion and debate.

The introduction of the computer technology allows for newer employment opportunities such as programmer, operator, graphic designer, network administrator, hardware maintenance staff etc. Nowadays, the progresses of countries are measured on the basis of ICT. If development of ICT is at climax, then such country is considered as highly developed. Although the ICT has been essential element of the modern society, it has caused both positive and negative impacts in the society.

Positive Impacts of ICT:

1. ICT has brought the world together through social networking sites.
2. ICT has made researching information easier.
3. Through social networking people can speak to family and friends from across the globe. This helps people who can't travel to visit family or friends.
4. Through ICT, teachers are able to create interactive classes and make the lessons more enjoyable, which could improve student attendance and concentration.
5. ICT has caused very positive impact in the field of health care.
6. Multimedia presentation.
7. ICT has made it possible to provide online education and distance education.
8. Create opportunity for Technological employment.
9. ICT has created many jobs for people.

The Bad Points/Negative Impacts of ICT

1. Children and Teenagers spend most of their free time using computers.
2. Using computers can have negative impacts on your health for example if you are looking at a computer screen for a long it could damage your eyes.

3. ICT can also affect people's personal health, as they aren't getting enough exercise as they are spending most of their free time indoors on computers instead of going outside.
4. Small local businesses are being affected by the effects of ICT.
5. Digital Divide.
6. Number of Employment Opportunity will be reduced.
7. The environment is affected /polluted by ICT because some people are not disposing their old electronic devices in a proper manner.
8. Many old people are feeling pressured with learning how to use new technology and with many services.
9. Plagiarism has become a common problem because of ICT.
10. There are also ethical impacts to ICT.

Difference between ICT and ICT education can be summarized as follows:

ICT

1. Information communication Technology (ICT) refers to the use of all electronic devices for communication, sharing information, creating and storing information and distributing information.
2. ICT itself is a discipline. It has its special contents, methods, applications and subject philosophy.
3. Computer science, computer engineering, IT engineering like hundreds of subjects are under this discipline.
4. Scope of discipline (ICT) includes technology innovation, technology research and technology application. It also covers the use of technology for human world such as climate change, human health, human security, scientific growth and development,
5. Technicians and technologists develop new tools and applications
6. Disciplinary functions of ICT are mathematics, electronics, communication, artificial intelligence, computing, computer language.
7. The persons specialized in this disciplines are computer scientists, computer engineer, communication specialist's, IT engineer, software engineer and many more respective to the concerned specialized areas of study.
8. ICT also has applied areas - ICT for business and communication, ICT for management, ICT for health etc.

ICT education

1. ICT education refers to the **use of ICT** in term of education and pedagogy. This is a growing discipline.
2. ICT in education has its basis on learning theory, curriculum theory, assessment theory, social theory and psychological theory.
3. Research and innovation on the use of ICT in education is the field of ICT education.

4. Preparation of alternative pedagogy such as virtual pedagogy, virtual learning, virtual school, e-assessment etc. is the areas of ICT education.
5. Blending e- learning to conventional learning is also the fields of ICT in education.
6. Human resources produced from this course are ICT educators, ICT teachers, ICT trainers, ICT curriculum specialists, ICT policy people etc.

Summary

ICT Education mean: *Use of radio for instruction or Radio Assisted Instruction (RAI), use of television for instruction or Television Assisted Instruction (TAI), use of computer for instruction or Computer Assisted Instruction (CAI), use of Internet for Instruction or Internet Assisted Instruction (IAI) are said to be ICT in education if one or all of them technology mediated instruction exists in education delivery system. ICT in education is also known as e-learning which have approaches like one-to many, one-to-one, one-to-alone or self in communicating and learning process.*

There are two very different and distinct aspects of ICT in education

1. One is teaching ICT itself, and
2. The second is using ICT as a better tool to the existing teaching methods which is more important; it will be very useful if the people study using it.

Functions/Use of ICT in Education

Following functions of the use of ICT in education are described in literature:

1. ICT as an object of study. It refers to learning **about ICT**. Mostly organized in a specific course. What is being learned depends on the type of education and the level of the students? Education prepares students for the use of ICT in education, future occupation and social life. (This study is an example)
2. ICT as an '**assisting tool**'. ICT is used as a tool, for example while making assignments, collecting data and documentation, communicating and conducting research. Typically, ICT is used independently from the subject matter.
3. ICT as a **medium for teaching and learning**. This refers to ICT as a tool for teaching and learning itself, the medium through which teachers can teach and learners can learn. It appears in many different forms, such as drill and practice exercises, in simulations and educational networks.
4. ICT as a **tool for organization and management** in schools.

Historical development of ICT and ICT education (World View)

The introduction of the modern **library** and the **pencil** began in the mid-1600s. It was the beginning of the use of technology in education. In the latter part of the 1970s, the very first computer was integrated into schools. The Slide Rule, The Hornbook, The Magic Lantern., The Jacquard Loom and were other development of the technology.

It was during the 1800s that students used **slates** which were small blackboards that were written on using a piece of chalk. Students used slates in place of pen and paper, even though slates were not very convenient for longer assignments and could only be used to solve short equations. Then they were erased so they could be used to solve a new equation. Then came blackboard, and now whiteboard is commonly used in teaching.



In 1822, **Charles Babbage introduced a calculating engine.** Charles Babbage is known as the “**Grandfather of Modern Digital Computing**” as we know digital computers in today’s classrooms. **The Typewriter, Stereoscopes** (Device to view images in 3D. The device was popular for home entertainment and was eventually marketed to schools for educational purposes), the Film Projector, and the Radio, the Overhead Projector, the Mimeograph (photocopy machine called *ditto machine*) *headphones, videotapes, photocopier, calculator, Personal Computer (PC), and Interactive whiteboard and many more are technological devices which can be used for teaching.*

(Please follow this source: <http://www.ourict.co.uk/technology-education-history/>)

We can summarize the development of ICT and its education in the following points:

1. Historically, Use of radio and television as ICT tools for education (Before Computers).
2. In the modern time only, computers came to be used. (Computer is a Modern ICT tool).
3. Computer are used beyond computation.
4. Creation, sorting and communication of the contents/ as technology of computer science is a bit advance form of ICT and it is still growing.
5. Web 2.0 technology in computer science and communication engineering.
6. ICT education starts from the use of radio for education purpose science 1924 in USA and wider use since 1970.
7. Interactive radio is used for education.
8. Televisions were used in education. In 1980s Television University began in china. Different teacher education /training programs ran through television.
9. Use of internet and communication tools and technology through web 2.0 technology in education..
10. Interactive radio and television is in improvement in content delivery.

11. Interactive communication through internet use using different communication technology.

ICT Policy In Education

Innovation and use of communication technology made possibility of using these technologies in education compel governments of different country to set ICT policy in education. These days, ICT policy in education has interlinked with the policy of the nation itself.

1. The ICT community claims the possible use of the ICT in education and made some contribution in this aspect.
2. Country started to rethink on the use of ICT in education and developed ICT policy.
3. ICT in education policy focused on school education and university education.
4. Both development and developing countries have his policy, but the focus of the policy differs
5. Nepal developed ICT policy (2013-2017) giving emphasis on using ICT in education from school to university education.
 - (a) Infrastructure development
 - (b) Teacher training/ teacher education
 - (c) Connectivity in every school
 - (d) Computer lab
6. Neighboring countries- India, China and all SAARC countries have developed ICT policies.
7. Major focus of the policy seen in infrastructure development, training / education, integration ICT into different subjects, e- library, e- learning, e-assessment, develop ICT as tools for teaching learning and research.

Web 2.0

Web 2.0 is the current state of online technology characterized by **greater user interactivity and collaboration**, more pervasive network connectivity and enhanced communication channels. One of the most significant differences between Web 2.0 and the **traditional World Wide Web (WWW)**, retroactively referred to as Web 1.0) is **greater collaboration among Internet users, content providers and enterprises**.

Originally, data was posted on Web sites, and users simply viewed or downloaded the content. Increasingly, users have more input into the nature and scope of Web content and in some cases exert real-time control over it. The **social nature** of Web 2.0 is another major difference between it and the original, static Web. Increasingly, websites enable community-based input, interaction, content-sharing and collaboration. Types of social media sites and applications include forums, microblogging, social networking, social bookmarking, social curation, and wikis.

ICT in Education in Nepal

ICT Education = Education about ICT

ICT in Education = Use of ICT in teaching and learning (Instruction/ as a Pedagogical Tool)

ICT in education is understood as technology-assisted instruction (k[l]lwsf] k[of]uaf6 lzIf0fk[l]lwsf] ;xof]udf lzIf0f_. In other words, use of radio for instruction or Radio Assisted Instruction (RAI), use of television for instruction or Television Assisted Instruction (TAI), use of computer for instruction or Computer Assisted Instruction (CAI), use of Internet for Instruction or Internet Assisted Instruction (IAI) are said to be ICT in education. ICT in education is also known as e-learning. This instruction refers to teaching methods or models of instruction delivery. ICT is supporting, enhancing and enabling course content delivery (UNESCO, 2014). Technology is used as tools to support knowledge construction and support learning by construction.

Sometimes, there is a common misconception that ICT-based Education (ICT in Education) is about teaching students computer skills. ICT-based Education is about using computers and technology as tools to enrich learning in various subjects such as English, Science and Mathematics and so on.

Successful ICT in Education program

- .Teacher training
- Technology and network instruction
- Digital content
- Local capacity and community

Key Benefits of ICT-based Education (ICT in Education):

- Promotes Learning by doing approach
- Enables self-paced learning
- Provides access to wide range of up-to-date learning materials
- Enriches learning through a combination of audio, video, images, text and animation
- Enhances learning through interaction and collaboration
- Provides a platform that engages students

In the context of Nepal, the use of ICT in education can be traced out as early as in 1980s with implementation of **Radio Teacher Training Project (RTTP, 1980-1985)** for qualifying and upgrading for working primary teachers. However, use of emerging ICT in school education is recent attempt. It started from teaching as a computer science as subject to- use of computer for administrative works to- pedagogical interventions.

Computer in Nepal came into existence only in 1972 for utilization of it in public census **on rent**, monthly NPR 1, 25,000 which was installed in Electronic Data processing Center under Central Bureau of Statistics. This Bureau was, turned into National Computer Center (NCC) in 1975 in autonomous capacity. But it collapsed after establishment of ministry of **science and technology**. In education, computer was **first utilized for publication of SLC results in 1981** in collaboration with **National Computer Center** and continued until in-house computer system was established in Office of Controller's Examination in 1998. However, these efforts were only using ICT for smooth office operation rather than use of ICT for pedagogical purposes.

Ministry of education first utilized computer **for analyzing education information** and data and school mapping program in 1989 with support of Internal Efficiency in Education System (IIES) project. Gradually it lead to have computers in other central departments, regional directorate and district level for under MOE smooth office operation.

Right after restoration of multiparty democracy system in the country, new curriculum 1992 was implemented. This provisioned the access to those who were willing to learn computer science as a subject from the list of optional subjects, to be started in grade 9 and to be terminated in SLC examination (as an elective subject). The first SLC graduates with computer science appeared from SLC examination of 1995 and onwards. However, government programs for supporting computers provisions for school got low priority until implementation of EFA program (1999-2004).

At the moment in the implementation process of SSRP, 2009 onwards up to now government has committed to support school computer program with a matching fund of NRS 200,000 per school if they claim that they have computer infrastructure and government provides 80% of committed sum as their share and provide computer training to teachers. Presently, Ministry of Education (MOE) is promoting ICT in education sector by paying high focus to empower learners, teachers, educators, managers and leaders.

One Laptop computer per Child (OLPC)

One Laptop computer Per Child (OLPC) was another government's effort in utilizing ICT in school education in 2007. OLPC was pilot program in 26 primary schools of 6 districts, implemented in collaboration with Open Learning Organization (OLE), an NGO in Nepal. The selected districts were Dadeldhura, Kapilvastu, Kavre, Lalitpur, Makwanpur and Mustang). After the completion of the pilot, it is expected that the OLPC project will

expand across the entire country in a phase-wise manner. The districts, regions, funding partners and number of schools for each district are as follows:

- Dadeldhura, Far Western Hills, UN World Food Program, 3 schools
- Kapilvastu, Western Terai, Danish Embassy- Local Grant Authority, 3 schools
- Mustang, Western Mountains, Government of Nepal through DDF, 7 schools
- Kavre, Mid Hills, Danish Embassy- Local Grant Authority, 3 schools
- Lalitpur, Mid Hills, Danish Embassy- Local Grant Authority, 5 schools
- *Makwanpur, 5 schools*



Laptops were donated to OLE Nepal by SWIFT Banking Group in Europe through the OLPC Foundation. A total of 4400 laptops were received for the program in Nepal. The donation demonstrates the interest that the program in Nepal is generating in the global OLPC community. OLE Nepal deployed the project in various districts with the help of DEO, DoE, and partner organizations.

This OLPC program could not satisfy clientele needs and government did not expand it in national scale. However, innovative works done by OLE are considered to be **e-library**.

Activities of Government of Nepal for ICT in Education

ICT and computer education courses have been offered in general as well as technical education. For example, National Centre for Educational Development (NCED) has been providing training to the teacher through National Radio and FM. Computer science has been taught as an optional subject in school (grades 9 to 12); Computer Engineering/Computer Science/ ICT program in Bachelor's and Master's Levels are run by different colleges under various universities. Various Training Institutes conduct technical education and vocational training courses in computer and ICT. Likewise, Tribhuvan University has started Bachelor's in Education program in computer science.

Ministry of Education (MOE) has implemented some of the programs related to ICT in Education. Lab model (computer sharing mechanism) Project in some schools and Internet connectivity to District Education Offices (DEOs) and schools (through matching fund to schools) and computer labs with internet connection from local ISPs. Similarly, Central Level Agencies under MOE, five Regional Directorates (REDs) and 75 District Education Offices have launched their web sites. Department of Education (DOE), with the involvement of some NGOs, has developed interactive digital learning materials for the students of grades 2 to 6 in Nepali, Mathematics, English and Science subjects.

Under the matching grant schemes (2007 to 2010), DOE (Department of Education) provided 2 computers and one printer to 3038 schools (DOE, 2010). Similarly, DOE provided with internet connectivity to 85 secondary schools conducting distance education programmes (DEO, 2012). Under the Formative Research Project under the Education for All programme, 2004-2009, MOE provided 62 schools with one computer and one printer to each. Besides, some NGOs, trusts and individuals have provided computers and other accessories to some schools and basic computers training to teachers.

During the fiscal year 2066/67 and 2067/68, the government of Nepal has supported for ICT related infrastructure and internet connectivity to 785 schools. Similarly, to improve educational management and delivery system, the Ministry of Education has provided some additional ICT related equipment's to all District Education Offices and launched website by each District Education Office.

However, such ICT equipments were mostly used for administrative purposes. This is due to the lack of contents as well as lack of proper skill and awareness to the teachers and education managers. For this a comprehensive policy and programme yet to be developed in order to provide relevant ICT education to the students and to use ICT for improving teaching learning activities.

ICT in Education in Nepal (summary)

Note- Muni shakya who was the first computer engineer who made microcomputer in nepal. In a meeting with him, he told people from China came to see his computer. This could be first initiation of computer based programme in the development of ICT in nepal.

- 1) *National computer center for census data processing*
- 2) *IT policy*
- 3) *ICT in education Master Plan(2013-2017)*
- 4) *Introduction of computer science courses university and school*
- 5) *Programmes in ICT based Education:*
 - i. *Radio education in Nepal for teacher training*
 - ii. *Interactive radio program for mathematics in secondary level*
 - iii. *One laptop per child (OLPC) 2008*
 - iv. *Virtual school 2015*
 - v. *ICT based education ;Open and distance learning system, teacher*

ICT Policy in Nepal

For having successful programs in ICT in education, policy is one of the main components. There is an absence of consolidated ICT in Education policy in education in Nepal. However, the IT Policy (2010), SRRP (2009-2015) and Three Year Plan 2011-2013 of the GON have provided some policy and strategy for the development and integration of ICT in education.

IT Policy (2010) has the following policy provisions: a) *Expansion of access of the Internet to all schools;* b) *Coordination and collaboration with national and international institutions to develop skilled human resources for continuous.....* c) *relevant and quality education;* d) *Promotion of Industry-Academia Collaboration*

(IAC); and e) Formulation and implementation of special IT program focusing on students, teachers and schools in order to develop competent human resources.

The School Sector Reform Plan (SSRP) has made a policy provision to develop ICT infrastructure in education and provide alternative modes of schooling through the use of ICT. One of the objectives of distance learning and distance education set by the MOE is to develop learning support materials to enhance quality of education through the use of ICT.

The three year plan, 2011-2013) of GON (NPC, 2011) has included the following policies related to ICT in Education: schools will be encouraged to use ICT in education to increase access to quality education in rural areas, digital divide will be reduced, and ICT will be integrated in all aspects of education.

The Ministry of Education aims at providing necessary skills on Information and Communication Technology to the students as well as using Information and Communication Technology as an important tool to improve classroom delivery, increase access to learning materials and improve effectiveness and efficiency of overall educational governance and management. Considering the aim, the Ministry of Education has prepared this Master Plan on Information and Communication Technology in Education (2013-2017). This Plan is guiding for the activities and programmes on Information Communication Technology.

This Master Plan includes four major components on ICT in education: ICT infrastructure including internet connectivity, human resources, content development and system enhancement. These four components also cover the four pillars of ICT in education; they are **infrastructure, connectivity, teaching learning materials and human resource**.

The master Plan covers five major sub-sector of education, namely, School Education, Higher Education, Teacher Education and Training, and Continue Education and Life-long Learning. Besides, it also includes Governance and Management in Education. Similarly, the plan mentions overall institutional arrangement to implement this plan and identifies monitoring and evaluation process of the plan. For each of these components, this plan identifies objectives, strategies, programs and activities, key results and targets and estimated cost. It also identifies the implementation arrangement as well as monitoring and evaluation structures, process and activities.

Virtual school/ Classroom

A virtual classroom is a teaching and learning environment where participants can interact, communicate, view and discuss presentations, and engage with learning resources while working in groups, all in an online setting. The medium is often through a video conferencing application that allows multiple users to be connected at the same time through the Internet, which allows users from virtually anywhere to participate.

Virtual school refers to an institution that is not "brick and field" bound. All student services and courses are conducted through Internet technology. The virtual school differs from the traditional school through the physical medium that links administrators, teachers, and students. An online school (virtual school or e-school or cyber-

school) teaches students primarily online or through the internet. An online school can imitate many of the benefits provided by a physical school (learning materials, online exercises, self-paced courses, live online classes, tests, web forums, etc) but delivers these through the internet.

Advantages of Online/Virtual Learning

1. You can learn whatever you want: You can pick the program of your dreams with online education. For example, let's say you're mostly interested in neuroscience. All it takes is a Google search for such online course, and you'll easily find the online programs offered by some of the most prestigious universities from all around the world. The great variety of online programs and courses is a huge advantage of this type of education. It doesn't matter where you live and what you want to study – you can always find a suitable course or even a degree program that you can follow from home.

2. Comfort: Forget about attending classes for hours, sitting in an uncomfortable chair, and suffering from back

pain by the end of the day. You will not be bound to physical class session when you opt for online education. All lectures and needed materials are provided via online platforms, so you'll easily access them from the comfort of your home. You will not take public transport to get to campus, you won't have to spend money on gas for your car, you won't have to get up early to get dressed for class... the list



conveniences goes on and on. All you need is a large desk and a nice, comfortable chair.

3. Online courses look great on a resume/ biodata: It doesn't matter where your career stands at this moment; an online program will always look good on your resume. It will show potential employers that you're committed to learning and you're eager to obtain more knowledge and new skills. Hiring managers don't see online degrees as inferior to traditional ones. A degree is a degree. If you obtain an online degree from a prestigious university, you'll boost your career with the speed of light. You will certainly become a better candidate for a job promotion, and your resume will look much better when you apply for new positions.

4. Self-paced learning: When you start browsing through interesting online courses and programs, you'll notice the Self-Paced label on most of them. What does this mean? Self-paced learning means that the students can start completing the targets at any time, and he can arrange a learning schedule that meets his individual needs. When you enroll in a traditional college program, you'll have to forget about work, hobbies, and even family. In such setting, studying has to be a priority. That's why many single parents and people who work decide to forget all about their dreams to get a higher degree.

5. Lower costs: The fact that online programs are cheaper when compared to the traditional school setting. You only need passion for learning and a quick online search that will take you to the right course. From that point on, you will be the master of your own education.

Disadvantages of Online/Virtual Learning

1. Competition between students can be very stimulating and students will only benefit from it. **Online learning** cannot offer human interaction.
2. Another **disadvantage** refers to the fact that online courses cannot cope with thousands of students that try to join discussions.
3. Also, online learning can be difficult, if it is meant for disciplines that involve practice.

Online courses

A few numbers of students take online courses in Nepal. Many of the students take free online courses offered by organization like **iversity**, **edX** and **Coursera**.

The most renowned and nearly the only college for Distance Education and Online Studies in Nepal is ICA (International Center for Academics), which was established in 1997 and became the first Partner Institution (PI) of Indira Gandhi National Open University (IGNOU) in Nepal. It has been providing internationally acclaimed degrees through the ODL Mode of education in Nepal. ICA presently offers **44 different Academic**, Value Added and Awareness programs through Open and Distance Learning (ODL) mode in Management, Humanities & Social Science, Tourism, Computer Science, Journalism and Mass Communication, Education, Rural Development, Health Science, Social Work, Gender and Development Studies, Extension and Development Studies, Continuing Education etc.

In the latest years, Kathmandu University School of Management established the Virtual Classroom. This provides notes and assignments to the students who can directly and easily access the information with the help of internet. Let's have an introduction of some courses:

1. **Moodle:** This is course run by Kathmandu University, Nepal. It is a software package for producing Internet-based courses and web sites. It is designed to support a social constructionist framework of education. Moodle is chosen as the tool for e-Learning because it has many typical features that are suitable for a complete teaching learning activity. Features of Moodle include Assignment Submission, Discussion Forum, Files download, Grading, Instant Messaging, Online Calendar, Online News and Announcement, Quiz, Wiki. Beside these very important and useful features Moodle can be extended and we can add functionality to the Moodle features with lots of plug-ins available in the market.
2. **A MOOC (Massive Open Online Courses (MOOC's):** It is a type of FREE online course aimed at large-scale participation and open access via the web. MOOCs are a recent development in the area of distance education, and a progression of the kind of open education ideals.
3. **Courses from TU (Open and Distance Education Centre, ODEC, Nepal) :** Tribhuvan University has recently started to provide higher education in all subjects offered by Tribhuvan University in open and distance learning mode of education. Adults who are interested and compelled to upgrade academic qualification without quitting jobs/profession and are unable due to different reasons to come to conventional programme for higher education are the target group of this programme. The website at present shows the courses of English Education and Mathematics.

Computer Integration in Courses in Nepal (in University and Schools)

Until a few years back students hopeful to obtain higher education in technical disciplines had no option but to go abroad spending huge sums of money. However, in recent times, the country has taken a big jump as far as the higher education is concerned. In the last couple of years, the country has seen the emergence of a couple of new universities namely Kathmandu University, Pokhara University and Purbanchal University. With the opening of these universities, a variety of courses from various disciplines, which were not available previously in Nepal, have also become available. The availability of these courses at home and that too at a minimal cost as compared to the cost of studying the same abroad has been a significant development for the country and is very encouraging.

A variety of courses in IT are options for study in Nepal. In the last few of years, **Tribhuvan University, Kathmandu University, Purbanchal University** and **Pokhara University** have come their own programs in IT. They have been conducting IT courses either by themselves or through their affiliated colleges. Various IT courses offered by the above universities in Nepal are Bachelor in Computer Application (BCA), **Bachelor in Computer and Information Systems (BCIS), Bachelor in Information Technology (BIT), Bachelor of Engineering in Information Technology (BEIT), Bachelor in Information Management (BIM), Bachelor of Engineering Computer Engineering (BE comp engg.)**. Each of the above courses have their own eligibility criteria and has been designed to serve their own objectives. However, the common thing in all the above courses is that they aim to

prepare students for a rewarding career in IT. In addition to the given courses, Faculty of education (FoE) has introduced the semester-based B.Ed. programme in ICT Education.

In school education, after restoration of democracy, new curriculum 1992 was implemented, this provisioned the **access to those who were willing to learn computer science as a subject from the list of optional subjects**, to be **started in grade 9 and to be terminated in SLC examination**. The provision of studying **computer science as subject from elective** area still exist in school curriculum and **first SLC graduates with computer science appeared from SLC examination of 1995 and onwards**. The government programs for supporting computers provisions for school got low priority until implementation of EFA program (1999-2004). But DOE developed the programs for support of school computer with the provision of matching fund of NRS 100,000 with 40% school share and 60% government share during implementation of EFA II (2004-2009).

Unit-II

Learning theories and educational software / ICT tools

Learning theories and use of ICT

Learning theories are conceptual guidelines developed by the theories for learning knowledge. There are many such theories but three are common: **Behaviourism, Cognitivism (Mentalism)** and **Constructivism**. These theories are also called behaviourist, cognitivist (mentalist) and constructivist .

Behaviorism

- The term "behaviorism" was invented by John Watson (1878–1959). Watson believed the behaviorist view is a purely **objective experimental** branch of natural science.
- Behaviorists look at learning as an aspect of conditioning and will advocate a system of rewards and targets in education.
- There are also types of conditioning (such as classical conditioning by Pavlov and Operant Conditioning by B.F. Skinner, etc.)
- In behavior analysis, learning is the **acquisition of a new behavior through conditioning**.
- There are three types of conditioning and learning:
 - **Classical conditioning**, where the behavior becomes a reflex response to an antecedent stimulus.
 - **Operant conditioning**, where an antecedent stimuli is followed by a consequence of the behavior through a reward (reinforcement) or a punishment.
 - **Social learning theory**, where an observation of behavior is followed by modeling.

The behaviorist school sees the **mind as a “black box,”** in the sense that a response to a stimulus can be observed quantitatively, totally ignoring the effect of thought processes **occurring in the mind**. Early computer learning systems were designed based on a behaviorist approach to learning. The behaviorist school thought of postulates that learning is a change in **observable behavior caused by external stimuli in the environment**. Skinner argued that since it is not possible to prove the inner processes with any available scientific procedures, researchers should concentrate instead on ‘**cause-and-effect relationships**’ that could be established by **observation**. Behaviorists claim that it is the observable behavior that indicates whether or not the learner has learned something, and not what is going on in the learner’s head.

The most applicable principle is Skinner's operant conditioning which states three stage procedures for learning.- **Stimulus- Response – Reinforcement (S-R-R)**.

Cognitivism

Cognitive theories grew out of **Gestalt psychology**. Gestalt psychology was developed in Germany in the early 1900s by Wolfgang Kohler . The German word *Gestalt* is roughly equivalent to the English *configuration* or *organization* and emphasizes the whole of human experience.

Educators who embrace cognitive theory **prefer to study the learner rather than their environment and in particular the complexities of human memory**.

Gestalt psychologists criticize behaviorists for being **too dependent on overt behavior** (observable behaviour) to explain learning. They propose looking at the patterns rather than isolated events.

Two key assumptions behind this cognitive approach: that the **memory system is an active organized processor of information** and that **prior knowledge plays an important role in learning**. Gestalt theorists believe that in order for learning to occur prior knowledge must exist on the topic. When the learner applies their prior knowledge to the advanced topic, the learner can understand the meaning, and learning can occur. Cognitive theories look beyond behavior to consider how human memory works to promote learning, and an understanding of short term memory and long term memory is important to educators influenced by cognitive theory. They view learning as an internal mental process (including insight, information processing, memory and perception) where the educator focuses on building intelligence and cognitive development. The individual learner is more important than the environment.

Two of the key concepts within the cognitivism learning theory which create the new knowledge are accommodation and assimilation.

Assimilating causes an individual to incorporate new experiences into the old experiences. This causes the individual to develop new outlooks, rethink what were once misunderstandings, and evaluate what is important, ultimately altering their perceptions.

Accommodation, on the other hand, is **reframing** the old and new experiences into the mental capacity already present. Individuals conceive a particular fashion in which the world operates. When things do not operate within that context, they must accommodate and reframing the expectations with the outcomes.

Cognitive theorists assume that some types of learning, such as language learning, are unique to humans, which is another difference between these two perspectives. Cognitive psychologists also recognize that learning can take place in the absence of overt behavior.

Note: There Are Three Basic Components To Piaget's Cognitive Theory:

1. Schemas:(building blocks of knowledge).
2. Adaptation processes that enable the transition from one stage to another (equilibrium, assimilation and accommodation).
3. Stages of Cognitive Development:
 - sensorimotor,
 - preoperational,
 - concrete operational,
 - formal operational.

Technology and Learning Theories

Behaviorism emphasizes memorization and repetition in teacher-centered environments. The curriculum is structured hierarchically to allow students to gain prerequisite skills and advance to intermediate and advanced levels of knowledge. Predefined criteria and systematically constructed learning promote mastery. Technology is used to remedy identified weaknesses, promote fluency, and support practice through tutorials, drill and practice software, online worksheets, and other forms of computer-based learning.

Constructivism allows students to build rather than receive knowledge. Based on collaboration and cooperation, Constructivist Learning focuses on real problems, creative solutions, transfer, and problem solving. Teachers function as guides or facilitators that assist students as they generate solutions and explore in complex and rich environments. The curriculum focuses on higher-and-lower level skills; performance measures include checklists, rubrics, and portfolios. Technology (simulations, applications software, and multimedia, constructive and

informative software tools) is used to facilitate meta-cognitive skills, emphasize transfer, create group projects and presentations, highlight the contributions and talents of diverse learners, and explore the relationships between data.

Cognitive, Social, and Radical Constructivism, Multiple Intelligences, and Situated Cognition rely on individual and group thoughts, perceptions, and actions. Problems are solved through individual and shared meaning. Learners use technology (hypertext and hypermedia, bulletin boards, chats, computer-supported intentional learning environments, and computer mediated environments) to gather information, conduct research, communicate, decompose problems, share documents, and participate in open-ended learning

Learning from Technology: Behaviorist Perspective

Use of technology from the behaviorist perspective mirrors traditional classroom practice: **users are relatively passive, the content and interaction between the user and the software are predetermined, and there is a limited repertoire of acceptable responses.** The acquisition of facts through **repeated practice and rote memory, or learning from the technology**, is the goal of instruction.

Computer assisted instruction (CAI), integrated learning systems, **drill practice** programs, **computer-based tutoring systems**, and **assessment software are some of the technologies designed based on the behaviorist learning theory.** CAI and integrated learning systems have been readily adopted in many schools in the USA as they closely match the traditional routine of classroom life. It is argued that CAI can increase achievement because it leads to **automaticity of lower-level skills through extended practice.** A computer that is endlessly patient with the learner monitors this practice. In the tutorial form of computer-assisted instruction, the computer provides additional information to the learner if an incorrect answer is supplied. This continues until the learner is successful. Skinner's views of immediate positive reinforcement following a correct answer are directly applicable to drill-and-practice and tutorial forms of CAI

Constructivism

Constructivism is an educational philosophy which holds that learners ultimately construct their own knowledge that then resides within them, so that each person's knowledge is as unique as they are. Among its key precepts are:

- Situated or anchored learning, which presumes that most learning is context-dependent, so that cognitive experiences situated in authentic activities such as project-based learning;
- Cognitive apprenticeships, or case-based learning environments result in richer and more meaningful learning experiences;
- Social negotiation of knowledge, a process by which learners form and test their constructs in a dialogue with other individuals and with the larger society. Collaboration as a principal focus of learning activities so that negotiation and testing of knowledge can occur.
- Those who advocate constructivism believe that a learner's ability to learn relies to a large extent on what he already knows and understands, and the acquisition of knowledge should be an individually tailored process of construction. Transformative learning theory focuses upon the often-necessary change that is required in a learner's preconceptions and world view.

Constructivism is one of the hot topics in educational philosophy right now. It potentially has profound implications for how current 'traditional' instruction is structured, since it fits with several highly touted educational trends, for example:

- the transition of the teacher's role from "**sage on the stage**" (fount/transmitter of knowledge) to "**guide on the side**" (facilitator, coach);
- teaching "higher order" skills such as problem-solving, reasoning, and reflection (for example, see also generative learning);
- enabling learners to learn how to learn;
- more open-ended evaluation of learning outcomes;
- and, of course, cooperative and collaborative learning skills.

Founded by Jean Piaget, constructivism emphasizes the importance of the active involvement of learners in constructing knowledge for themselves. Students are thought to use background knowledge and concepts to assist them in their acquisition of novel information. When such new information is approached, the learner faces a loss of equilibrium with their previous understanding which demands a change in cognitive structure.

Constructivism has many varieties such as active learning, discovery learning, and knowledge building, but all versions promote a student's free exploration within a given framework or structure. The teacher acts as a facilitator who encourages students to discover principles for themselves and to construct knowledge by working answering open-ended questions and solving real-world problems. To do this, a teacher should encourage curiosity and discussion among his/her students as well as promoting their autonomy. In scientific areas in the classroom, constructivist teachers provide raw data and physical materials for the students to work with and analyze.

ICT & CONSTRUCTIVISM

Many schools and educators are adopting a 'constructivist' approach to teaching. This is closely tied in to the embedding of ICT in the learning framework constructivist teaching methods are based on constructivist learning theory which was developed by major thinkers: Jean Piaget, John Dewey and Lev Vigotsky. These philosophers were very influential in the development of progressive education. Constructivist theory holds that learners are not passive recipients of knowledge but are more active in the process. They build on previous experience in order to make sense of what they are learning. They are more active in the creation of meaning and knowledge. This leads to a more student centred approach in which the student guides his own learning.

IPads, Tablets & Autonomy

The introduction of iPads and tablets into the classroom gives pupils greater

JEAN PIAGET

JOHN DEWEY

CONSTRUCTIVIST THEORY

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Philosophers & developers of constructivist theory

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power and autonomy over what they are learning. These devices give immediate access to knowledge so the pupil becomes his own teacher, to a certain extent.

ICT Allows For Greater Engagement

Learning through play is also part of the progressive, constructivist approach. Picture a child playing with building blocks, absorbed in the activity and on his own. This is the best possible visualisation of constructivist learning theory. ICT, in the form of iPads, tablets, mobile devices and interactive flat screens, allow for greater engagement and




ICT ALLOWS FOR GREATER ENGAGEMENT

ICT, in the form of iPads, tablets and interactive flat screens, allow for greater engagement and interaction by the learner which means more fun and play.

The approach also helps with class discipline because it allows for a more interesting learner experience. Less boredom means less discipline problems.

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interaction by the learner which means more fun and play. The approach also helps with class discipline because it allows for a more interesting learner experience. Less boredom means less discipline problems. It also helps with self-esteem and the learner's faith in the education system.

Learning About & Through Computers

There is an idea that children are preparing themselves for taking on a role in the adult world. 'By embracing ICT, schools are better preparing their pupils for further education, higher education and on to the workplace. Learning about computers e.g. computer coding, as well as learning through computers should begin at primary level and continue into the junior and senior cycles.

An Optimistic Enlightened Approach

Constructivist learning theory is an optimistic, enlightened approach to education in which the child is seen as capable of learning on his own. Empowering pupils with tablets, and teachers with interactive touch screen monitors allows for a blended approach to teaching which is now becoming the norm. The old method of teaching is

being replaced by something more fun and effective. The revolution is well and truly under way and it is being driven by ICT.

Technology and constructivism. Cognitive research has uncovered successful patterns in tutorial, mentoring, and group discussion interactions. However, typical Internet chat and bulletin-board systems do not support a constructivist approach to learning and instruction. During the 1990s, researchers created tools such as Knowledge Forum, the Knowledge Integration Environment, and Co Vis to more fully address constructivist principles. Each of these tools invites collaboration by structuring the kinds of contributions learners can make, supporting meaningful relationships among those contributions, and guiding students' inquiries. Teachers who use information and communication technologies in their classrooms are more likely to have a constructivist perspective towards learning and instruction. Additionally, sophisticated information and technology communications tools can capture the cognitive processes learners engage in when solving problems. This affords teacher reflection and coaching to aid deeper learning. It also affords teachers the chance to learn from each other.

The role of the teacher in constructivist classrooms is to organize information around big ideas that engage the students' interest, to assist students in developing new insights, and to connect them with their previous learning. The activities are student-centered, and students are encouraged to ask their own questions, carry out their own experiments, make their own analogies, and come to their own conclusions. Becoming a constructivist teacher may prove a difficult transformation, however, since most instructors have been prepared for teaching in the traditional, objectivist manner. It "requires a paradigm shift," as well as "the willing abandonment of familiar perspectives and practices and the adoption of new ones" (Brooks and Brooks, p. 25).

ICT use for actionable, engaged and interactive learning

ICT creates interaction

ICT in Education means "Teaching and Learning with Interactive communication Technologies. ICT is not limited to the computers or the internet only. It ranges from the use of FM radio to the use of satellite for communication. A large amount of data, visuals available on any topic can be brought to the classroom from all over the world. That is why ICT has been considered as an emerging area with huge potential for making educational process more interactive and meaningful.

For most part of the world, use of ICT in education and training has become one of the top priority area. ICT enhances the teaching-learning process, the quality and accessibility of education, the learning environment, learning motivation and scholastic performance. Through ICT, images can easily be used in teaching and improving the retentive memory of students, **teachers can easily explain complex instructions and ensure students' comprehension and create interactive classes and make the lessons more enjoyable**, which could improve student concentration, involvement and attendance.

The principles of interactive teaching include:

- recognising children as individuals *actively* engaged in interacting with the world, rather than passive recipients of knowledge,
- assessing learning needs and tailoring teaching to the child's current level of knowledge and understanding ("scaffolding" or "child-centred" approach,

- “multimodal” interaction and expression – using different modes of presenting material and expressing ideas (drawing, video, audio as well as conventional texts) to engage learners,
- higher-order thinking – encouraging skills like analysis, synthesis, evaluation, sorting and categorising,
- improvable ideas – providing an environment where ideas can be critiqued and refined,
- diversity of ideas – exploring ideas and related/contrasting ideas, encouraging different ideas,
- building directly on others’ ideas to create joint knowledge products,
- democracy in knowledge building – everybody participates and is a legitimate contributor to knowledge, and
- learner agency and peer support – encouraging students to take responsibility for their own and one another’s learning.

2. 2 ICT can create actionable learning and teaching situation

Stanford doctoral candidate Molly B. Zielezinski and her colleagues provide five Actionable Tips for improving the quality and effectiveness of technology implementation in low-income schools. In the space below, you will find their ideas of technologies that can be used to match these applications for each tip suggested by Zielezinski.

Actionable tip 1: Stop using technology for remediation!

Unlike students enrolled in rich school districts, students enrolled in low-income rural and urban districts are more likely to use technology for remedial purposes. Rather than using technology for skill and drill activities, teachers as well as students, should be using Web 2.0 technologies for authentic tasks. Listed below are resources to help accomplish this in the classroom.

Twitter: Twitter is a free social media micro blog website that allows users to board cast posts. These post are called tweets. Students could use this tool to communicate and collaborate via sharing links, giving feedback, and advice. The use of hash tags can also be beneficial to organize discussion. Students can form discussion groups using hash tags or conduct research following different twitter handles. They may also seek help from other experts online as twitter users from different professional accounts often tweet back to help.

Wordpress: Wordpress is a platform where students can design and publish their own multimedia content. Wordpress is useful because designing and creating original web content gives students the opportunity to be content-creators rather than content-consumers. In a classroom, Wordpress can be used to create a portable, digital portfolio. Students are able to collaborate and communicate by commenting on articles written by other students and bloggers. Wordpress also allows you to add various forms of media such as images, video, widgets, and linking to various social media.

Creately: It is an Online flowchart maker. This website allows users to create flowcharts from various templates and manipulate the chart. There are also examples of flowcharts to search. It is free for up to 5 diagrams/flowcharts. Students could use a flowchart to show the sequence of steps in an experiment, visually represent a food chain, or organize their thoughts for a written essay.

Padlet: Padlet is an app that allows students to post onto a digital “corkboard.” This can be a useful discussion tool that allows students to quickly view and share thoughts and ideas with other students. Often, students in remediation rooms, sitting at a computer, watching the screen as it feeds them ideas and expecting them to later regurgitate these same ideas on a quiz or test. With Padlet, students are communicating with one another, sharing knowledge, or comparing and contrasting their ideas about a particular topic. Padlet is great for idea sharing in the classroom. It can be useful for brainstorming activities, activating and accessing students’ prior knowledge, or to compare and contrast different ideas. Here is a [video tutorial](#) of how to use Padlet to encourage students to describe their mathematical thinking.

MakeBeliefsComix: MakeBeliefsComix is a basic comic book style platform that can be used for digital storytelling. Rather than having students complete a traditional retelling of a story, allow them to create their story using a digital storyboard. Digital Storytelling apps can be useful for storyboarding historical events, mapping procedural or “how-to” writing, or planning out personal narratives. Learn how to make a comic using MakeBeliefsComix.

Actionable tip #2: Let students create original digital content.

By providing opportunities for students to create products (rather than continuously consuming pre-generated material), they gain a sense of ownership. Creative thinking spans disciplines and can involve real world learning. It allows the creator to take intellectual risks and try new things. Many times, students feel a sense of pride in sharing something they have created. This can lay a foundation for future skill development. Listed below are resources to help accomplish this in the classroom.

Educreations: Educreations is an iPad app that functions like a recordable whiteboard. Because it captures voice and handwriting and also allows the user to upload pictures to create interactive lessons and stories, Educreations is a powerful presentation tool. Students can write or dictate and then illustrate their own stories or create an animated re-telling of an existing story. It can also be used to annotate presentations.

Scratch: Scratch is a program that introduces visual, block-style computer coding. This free website allows students to create games and stories through the use of visual block style coding. Utilizing problem-solving skills, and a design-thinking approach, students animate their avatars (sprites) to act in certain ways. This is a great collaborative, creative tool that helps develop important Digital Literacy Skills. Students can use Scratch to animate stories and create games.

Piktochart : Piktochart is a free easy to use website that allows users to create info-graphs. Students will be able to visually display their thoughts through info-graphs. Whatever they choose to convey can be aided by custom or provided visuals. Piktochart can be used in any learning activity that requires students to respond to a question or topic. For example, students are given the topic of Water Cycle. This must teach about the Water Cycle using Piktochart. Students can now create whatever they would like to achieve this goal.

SketchUp: SketchUp is a 3-D modeling platform. This website allows students to create manipulable 3-D models. As they create their models, students will also learn the mechanics of using an online drawing program. Students could use SketchUp to design a building for an architecture class, to model a physical or mathematical concept, or to recreate scenes from a literary text.

Book Creator (app for iPad and other devices): Book Creator is an app that students can use to create digital books with photos, videos, sound, and narration. Book Creator is useful because it allows students to have a digital platform to share their synthesis of various topics. Book creator could be used to publish a piece of writing that students have spent time putting together. This app could be used with various genres of writing. Students would be able to insert pictures to enhance their writing and allow them more ownership over their work as they now have an audience to write for. Another way book creator could be used is to create informational reports in a science class. Students could research different animals and then put together a book about their animal and share it with their classmates. Through both of these examples students are creating original, digital content.

Actionable tip #3: Pick digital tools that promote interactivity and discovery.

Students develop problem-solving skills and increased levels of confidence through play. By providing interactive, open-ended tools, students can explore and tinker to develop their own understanding of how things work. This exploration provides a feeling of accomplishment that will often times lead to sharing and collaboration with classmates. Listed below are resources to help accomplish this in the classroom.

Minecraft : is a game where you dig and build different kinds of blocks and use permutations of them to craft different items. There are also enemies to kill, animals to tame and towns to build! students learn collaboration techniques, discover concepts using observation, trial-and-error and games-based activities. The openness of the game encourages exploration, letting students experiment to meet different goals. Teachers can make in-game student activities adapted to specific objectives and standards. Students can use the in-game blocks to build one-, two-, and three-dimensional objects to discover the conversions, differences and similarities between length, area, and volume.

Desmos: Desmos is an online graphing calculator that can graph a host of functions in a quick, easy way. It is intuitive and easy to learn. There is also a free app for students to download that can give students with a smart phone access to a high-powered graphing calculator. The website also offers many ready-made activities for educators to use, or the tools to make their own. Students are presented with a container that is being filled with water. They must estimate how the level of the water changes over time, and show their findings in the form of a graph. They do would do this again several times using increasingly complex containers.

Geogebra : Geogebra is a dynamic mathematics software that is designed to help students discover and learn mathematical principles through live manipulation. Geogebra contains several interactive apps including spreadsheets, a graphing calculator,

a computer algebra system, geometry, 3D graphics, and probability. Students can create their own materials, use materials created by the teacher, or use other people's previously created material to explore and manipulate mathematical concepts to find patterns and draw conclusions. Students can manipulate a transversal that is cutting across parallel lines to discover which angles will always be congruent and which angles will always be supplementary. Students can change pieces of a quadratic function and see how they affect the parabolic graph. They can discover how to translate a quadratic function.

Energy Skate Park :Energy Skate Park is an interactive javascript where students learn about conservation of energy with a skater dude. Students build tracks, ramps and jumps for the skater and view the kinetic energy, potential energy and friction as he moves. Students can also take the skater to different planets or even space. There is also a list of teacher submitted activities available on the website. On this same website, there are interactives ranging in various topics from electricity to light to power. You can even search by grade level. This can be used to explore the law of conservation of energy as well as what factors impact more/less potential or kinetic energy.

DragonBox: DragonBox is a series of games that supplement the teaching of the basics of algebra to kids in a natural, fun, and effective way. DragonBox is useful because it gives students an introduction to algebra in a game like format and allows teachers to see an overview of the progress and knowledge each of their students are making. DragonBox lets the students learn algebra by using colorful and fun objects that are gradually replaced by numbers and mathematical expressions similar to equations on paper. It builds the conceptual knowledge in the early stages and leads students to the more abstract concepts as they achieve each level. DragonBox allows them to discover the idea of isolating the variable and solving for that variable. This iPad app could be used with students to introduce the skill of isolating the variable or it could be used to reinforce these algebra concepts after being taught.

Atmosphere Design Lab This website is an interactive way for students to learn about the different types of gases that make up the atmosphere. This website is useful because it allows students to learn more about the gas and it's importance in the atmosphere. You can read about what would happen if the percentage of each gas was increased or decreased. You could have students go through and explore this tool after learning about the different gases to understand more about how the levels affect our environment as well as why we need the composition we need to survive. The visual images also help to solidify some understanding of what the alternate worlds would look.

Duolingo :Duolingo is a free language-learning platform that includes a language-learning website and app, as well as a digital language proficiency assessment exam. Duolingo is ad-free and offers all its language courses free of charge. As of April 2016, the language-learning website and app offer 59 different language courses across 23 languages; with 23 additional courses in development. Students can definitely discover other cultures through languages. Allow students to choose a language and culture to study. Duolingo allows them to speak, practice, and explore using different languages. This is an extremely interactive website/app for students to use in whatever way you see fit.

VoiceThread: VoiceThread can be used to create multimedia slideshows with video, images, documents and voiceovers. VoiceThread is useful because it is multimodal and shareable between teachers and students, and students with their classmate. Students and teachers could create a presentations to share, interact with one another's presentations, and give feedback. When working in a group, each contributor can leave comments via text, voice, audio file or video.

Actionable tip #4: Honor students as experts, and let them share their expertise with an authentic audience.

Students have noteworthy knowledge and information that they are capable of sharing with authentic audiences. It up to us as teachers to give them an avenue to connect with these authentic audiences. Various technology tools can help us with this quest. Listed below are resources to help accomplish this in the classroom.

Kidblog: Kidblog is a safe, simple, authentic, and transformative way for students to publish their work on a blog and truly feel like they have an audience they are writing for. Kidblog is useful because it provides the tools to help students publish writing safely online and teachers can monitor all activity within their blogging community. Publishing is made very kid-friendly and the teacher can monitor all comments. It increases students' motivation to write because they have a meaningful purpose and it allows for engagement in the entire writing process.

Youtube: Youtube is a video hosting website where users can enjoy the videos and music, upload original content, and share it all with friends, family, and the world. Users can create their own channels to house their videos and create playlists. However, be careful on the age restrictions--users should be 13 years old. Youtube links with google accounts. It would be useful have students post the video as either private or can only be accessed with link if you have privacy concerns. Youtube gives the students the possibility of anyone in the world viewing it, therefore there is the authentic audience. Viewers have the option to leave feedback, rate the videos and even share the videos allowing for feedback for the student. The playlist and channel features allow for students to be "experts" and have their own channels.

Technology should not replace the teacher but rather assist the teacher in the classroom. Teachers play a critical role in maintaining a blended learning environment. While not much research has been done in this area, we know that students do the best when they are able to work with peers and feel supported by their teacher. In the blended learning environment, students

need to receive immediate digital feedback from their teachers. Listed below are resources to help accomplish this in the classroom.

2.3 Learning through networking - alternative view of learning

Networked learning is a process of developing and maintaining connections with people and information, and communicating in such a way so as to support one another's [learning](#). The central term in this definition is connections. It takes a relational stance in which learning takes place both in relation to others and in relation to learning resources.

Social networking sites (SNSs) have the potential to facilitate interaction, communication, and collaboration.

Social networking sites are educational tools because students can use them for communication and social support as well as for discovering and sharing knowledge. However, because of their advantages in communication, these social networking sites have a huge potential for education. This subject is under debate and under study in different countries and cultures, and input is needed from various perspectives.

In general, the social networks sites provide users with a private virtual space where each one could build his own public profile and manage a list of links to other users' profile.

Facebook (facebook.com)

Founded in 2004 by Mark Zuckerberg, this social network site was formerly named thefacebook.com and was designed as a closed online social network, available only for Harvard University staff and students. Subsequently, network access has been extended to other universities and companies like Apple or Microsoft. Since 2006, Facebook provides free access regardless the membership in a university or company. The network is based on Web 2.0 technology and is available from any computer with Internet access, providing support for other several device types, including mobile devices, benefiting from optimized software interfaces, especially designed.

Users can look up for their friends from around the world and can build their own profile that can be public or private. The profile could be changed at user will or, public profiles could be blocked by the administrators if other users are reclaiming the content. Each user is allowed to post messages or photos which, also, could be public or could be addressed to a specific group or users. More recently, Facebook also provide different types of games for the users' entertainment.

The main controversy which Facebook has been facing since the beginning concerns the respect for private life, given that information about user's privacy can be gathered for advertising purposes, by placing ads on the each user's page and several analyses are made by Facebook for his commercial partners in order to study the social behavior of each user.

There are two approaches:

(a) Learning for using Facebook

(b) Using Facebook for learning

Possible uses of facebook in education

There are many possible uses of Facebook in education, some authors (Onlinecollege.org, 2009) stating about 100 ways to use Facebook in the classroom, in order to provide value to the educational process. The main features which recommend Facebook as a valuable tool which could be used in education are:

- ♣ Teachers can create custom list of students and manage groups of students on custom topics related to courses;
- ♣ Exchanging information through links, photos or multimedia content related to specific subjects;
- ♣ Creating surveys and quantifying the feedback
- ♣ Using the on line chat for direct communication between students and teachers.
- ♣ Publishing news on tests, exams or face to face meetings.
- ♣ Integrating Facebook with other collaborative services provided by other application (like Google docs).
- ♣ Using Facebook as a complement for an eLearning platform

Twitter (twitter.com)

Twitter is a micro blogging service based on WEB 2.0 technology. The main characteristic of Twitter is the feature of transmitting short messages like SMS, up to 140 characters. Formerly, many users considered Twitter an alternative SMS service in the Internet. Being two years younger than Facebook, Twitter is online since 2006 at www.twitter.com. In the online community, the short messages transmitted through twitter are known as “tweets” and the users of Twitter “tweeters”. In order to transmit a message, a user could directly access the twitter web site or could use a dedicated interface such: Twitpic, Digsby, Tweetdeck, etc. Several mobile phone operators from different countries allow the transmission of messages on Twitter network through SMS, using your mobile phone. The base concept for Twitter is to allow the users to publish their own notes on a personal Twitter account and, in the same time, to let them read messages posted by other users on their accounts. Each person could define a custom list of Twitter users and is allowed to follow notes posted by these people. The virtual space provided by twitter for micro blogging is used nowadays in many activities:

- Publishing news: by newspapers or media agencies. There are several TV stations (like CNN or PROTV) which publish the latest news on Twitter, allowing users to be informed in the shortest time via mobile phone notifications.
- Promoting blogs: Many Twitter users have personal blogs and are using Twitter in order to promote their activity on a personal blog and to attract new visitors. Meanwhile on blog pages could be inserted Twitter widgets which foster the micro blogging.
- Promoting political activities: In recent years Twitter started being used extensively for political action: elections, protests, etc. There are countries where large protests were coordinated on Twitter, when local authorities tried to censor the calls to protests in local media

A standard is a structure for identifying the elements of a competency by establishing the guidelines for assessment. A competency is therefore evaluated through each of the relevant standards involved. In other words, if a competency has four criteria then there are four standards (and the assessment of those standards is tantamount to assessment of the competency).

