

# The Impact Of Information And Communication Technology (Ict) On Electronic Learning

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**Abstract:** Information and Communication Technology has played a key role in the development of most sectors in the country which education is no exemption. Before the advent of technology in educational sector there was no policy of distance education until Information and Communication Technology was introduced at the teaching and learning process. The advent of Information and Communication Technology has necessitated the introduction of E-learning in the tertiary education across the globe which Ghana is no exception. Currently most of the tertiary institutions have introduced e-learning where some of their courses can be pursued online because of invention of ICT. A study has revealed that most of the people in the society are claiming that due to the advent of ICT, education has been brought to their door steps. Before the inception of ICT a lot people more especially workers were finding it difficult to pursue or further their education due to their time schedule. The study was to assess the negative impact ICT has made on the introduction of e-learning in Ghanaian educational sector.

**Keywords:** e-learning, information, negative impact, invention, Information and Communication Technology

## 1.0 Introduction

E-learning is learning utilizing electronic technologies to access educational curriculum outside of a traditional classroom. In most cases, it refers to a course, program or degree delivered completely online. There are many terms used to describe learning that is delivered online, via the internet, ranging from Distance Education, to computerized electronic learning, online learning, internet learning and many others. We define eLearning as courses that are specifically delivered via the internet to somewhere other than the classroom where the professor is teaching. It is not a course delivered via a DVD or CD-ROM, video tape or over a television channel. It is interactive in that you can also communicate with your teachers, professors or other students in your class. Sometimes it is delivered live; where one can "electronically" raise your hand and interact in real time and sometimes it is a lecture that has been prerecorded. There is always a teacher or professor interacting communicating with you and grading your participation, your assignments and your tests. ELearning has been proven to be a successful method of training and education is becoming a way of life for many citizens across the globe.

## 2.0 Characteristics of e-learners

E-learning is not for everyone. Because eLearning courses offer the flexibility to fit into a student's available time schedule, an eLearning student must have the self discipline to work through the material on a consistent and regular basis in order to keep up with the rest of their classmates. Usually, a textbook is required just as it would be in a regular on-campus program. Although you may not be sitting in a classroom with other students, eLearning courses are often comprised of a group of students, called cohorts, who learn the material separately, but simultaneously and are expected to interact with one another about the material throughout the week via discussion boards, typically through an online classroom management system. There are usually scheduled test due dates and assignments that must be submitted on time. It takes real self discipline, as well as time management and

organizational skills. If you have that self discipline and organization, then eLearning will be a good choice for you.

## 2.1 Methods of e-learning

E-learning resources within the eLearningNC.gov site are related to online, delivery and interaction over the Internet, using classroom management systems (CMS) such as Blackboard, Moodle, Vista or Angle. Using a CMS (and a web browser), students can log in from anywhere in the world to access their class materials and interact with one another. Each institution uses a specific system, but they are all similar in their ability to present course material including class syllabus, assignments, quizzes, and provide video and audio plus a whiteboard screen where the lesson is presented just like it would be on a classroom's video screen or blackboard [2]. One can interact with instructors, access course materials and stimulate debate among ones fellow students when it fits ones schedule. In most courses, you must keep up with the scheduled course work. Courses are instructor led and in most instances, follow the same semester schedule as traditional courses. All specific course information such as how to reach the instructor, what work is expected, and deadlines to turn in assignments and take tests will be found within ones course site

## 2.2 Benefits of e-learning

Understanding the e-learning advantages and disadvantages is important when considering how to make instructional and learning decisions. The article also looks at this information from an online and distance education perspective. E-learning Pros and Cons need to be considered in equal measure. Many organizations and institutions provide different forms of training and instruction to their employees or learners. Typically they provide needed training by sending people to school, holding in-house training classes, or providing manuals and self-study guides. In some situations it is advantageous for them to use other forms of e-learning instead of the traditional training. Learners can proceed through a training program "at their own pace and at their own place." They can also access the e-Learning course at any time and only as much

as they need. This is also known as "Just in time and just enough." E-Learning courses are accessible by Web browsers on any platform: Windows, Mac, UNIX, OS/2, Amiga, etc. You can deliver your training program to any machine over the Internet or intranet without having to author a program specifically for each platform. Most computer users have access to a browser, such as Netscape or Internet Explorer, and are connected to a company's intranet and/or have access to the Internet. No separate distribution mechanism is needed. E-Learning courses are accessible from any computer anywhere in the world, which keeps delivery costs low. After the e-Learning course is released, any changes can be made on the server hosting the program and everyone worldwide can instantly access the update. Courses can be designed to access designated current information, such as the latest new product specifications, from any other server worldwide for an on-the-fly update whenever the e-Learning course is run. There are no travel costs for bringing remote employees to a centralized workshop because the Web is available from all desktops. According to some analysts, the actual time required for training by computer averages about 50% to that of instructor-led training, further saving money. Learners may have the option to select learning materials that meets their level of knowledge and interest. They can study wherever they have access to a computer and Internet. Self-paced learning modules allow learners to work at their own pace and different learning styles are addressed and facilitation of learning occurs through varied activities [3]. Development of computer and Internet skills that are transferable to other facets of learner's lives. Successfully completing online or computer-based courses builds self-knowledge and self-confidence and encourages students to take responsibility for their learning

### 2.3 Features Unique to e-Learning

Like no other training form, e-learning promises to provide a single experience that accommodates the three distinct learning styles of auditory learners, visual learners, and kinesthetic learners. Other unique opportunities created by the advent and development of e-learning are more efficient training of a globally dispersed audience; and reduced publishing and distribution costs as Web-based training becomes a standard. E-learning also offers individualized instruction, which print media cannot provide, and instructor-led courses allow clumsily and at great cost. In conjunction with assessing needs, e-learning can target specific needs. And by using learning style tests, e-learning can locate and target individual learning preferences. Additionally, synchronous e-learning is self-paced. Advanced learners are allowed to speed through or bypass instruction that is redundant while novices slow their own progress through content, eliminating frustration with themselves, their fellow learners, and the course. In these ways, e-learning is inclusive of a maximum number of participants with a maximum range of learning styles, preferences, and needs.

### 2.4 Challenges facing e-learning

Unmotivated learners or those with poor study habits may fall behind and lack of familiar structure and routine may take getting used to. Students may feel isolated or miss social interaction thus the need to understanding different

learning styles and individual learner need and instructor may not always be available on demand. Slow or unreliable Internet connections can be frustrating and managing learning software can involve a learning curve. Some courses such as traditional hands-on courses can be difficult to simulate. Up-front investment required of an e-learning solution is larger due to development costs. Budgets and cash flows will need to be negotiated. Technology issues that play a factor include whether the existing technology infrastructure can accomplish the training goals, whether additional technology expenditures can be justified, and whether compatibility of all software and hardware can be achieved. Inappropriate content for e-learning may exist according to some experts, though are limited in number. Even the acquisition of skills that involve complex physical/motor or emotional components (for example, juggling or mediation) can be augmented with e-learning [6]. Cultural acceptance is an issue in organizations where student demographics and psychographics may predispose them against using computers at all, let alone for e-learning. Technology issues of the learners are most commonly technophobia and unavailability of required technologies. Portability of training has become strength of e-learning with the proliferation of network linking points, notebook computers, PDAs, and mobile phones, but still does not rival that of printed workbooks or reference material. Reduced social and cultural interaction can be a drawback. The impersonality, suppression of communication mechanisms such as body language, and elimination of peer-to-peer learning that are part of this potential disadvantage are lessening with advances in communications technologies.

**Information and communications technology (I.C.T.)** is often used as an extended synonym for information technology (IT), but is a more specific term that stresses the role of unified communications<sup>[1]</sup> and the integration of telecommunications (telephone lines and wireless signals), computers as well as necessary enterprise software, middleware, storage, and audio-visual systems, which enable users to access, store, transmit, and manipulate information.<sup>[2]</sup> The term ICT is also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or link system. There are large economic incentives (huge cost savings due to elimination of the telephone network) to merge the telephone network with the computer network system using a single unified system of cabling, signal distribution and management. Information and communication technologies potentially offer increased possibilities for codification of knowledge about teaching and for innovation in teaching activities through being able to deliver learning and cognitive activities anywhere at any time. Learning at a distance can furthermore be more learner-centred, self-paced, and problem solving-based than face-to-face teaching. It is also true, however, that many learning activities cannot be coordinated by virtual means only. The emulation and spontaneity generated by physical presence and social groupings often remain crucial. Likewise, face-to-face exchanges are important when they enable other forms of sensory perception to be stimulated apart from these used within the framework of electronic interaction. However, the influence of distance and time is waning now

that the technological capacity is available for knowledge-sharing, remote access and teamwork, and organising and coordinating tasks over wide areas [7].

## 2.5 Vision of E-learning in Africa

Moving to Senegal in 2009, e-Learning Africa continues to build and expand a worldwide network for people involved in all aspects of technology-enhanced education and training in Africa, including management and policymaking. As with the previous conferences, Learning Africa 2009 will be conducted in both English and French. E-Learning Africa is the most comprehensive conference on ICT for development, education and training on the Continent. Its mission is to bring people together who are actively engaged in education and in the implementation of learning technologies in schools, universities, corporate training as well as in education in the public sector. Participants are high-level decision-makers such as Ministers of Education, representatives from government agencies, Non-Governmental Organizations (NGOs), development agencies and international organizations, senior executives from businesses, as well as practitioners from all fields of education. The promises of e-learning for transforming tertiary education and thereby advancing the knowledge economy have rested on three arguments: E-learning could expand and widen access to tertiary education and training; improve the quality of education; and reduce its cost [5]. Knowledge, innovation and Information and Communication Technologies (ICTs) have had strong repercussions on many economic sectors, e.g. the informatics and communication, finance, and transportation sectors [2]. The knowledge-based economy sets a new scene for education and new challenges and promises for the education sector. Firstly, education is a prerequisite of the knowledge-based economy: the production and use of new knowledge both require a more (lifelong) educated population and workforce. Secondly, ICTs are a very powerful tool for diffusing knowledge and information, a fundamental aspect of the education process: in that sense, they can play a pedagogic role that could in principle complement or even compete with the traditional practices of the education sector. ICTs sometimes induce innovations in the ways of doing things: for example, navigation does not involve the same cognitive processes since the Global Positioning System (GPS) was invented [3]; scientific research in many fields has also been revolutionised by the new possibilities offered by ICTs, from digitisation of information to new recording, simulation and data processing possibilities [9]. The speed with which Information Communication Technology (ICT) is developing and its impact on socio-economic activities cannot be overemphasized. ICT, according to UNDP, has been defined to include the full range of electronic technologies and techniques used to manage information and knowledge. It is imperative that Africa is not excluded from the technological revolution. It is a stark fact that the use of ICT has been integrated into virtually every facet of commerce, education, governance and civic activity in developed countries and has become a critical factor in creating wealth worldwide. Unfortunately in Africa, ICT has barely taken a foothold. Computer illiteracy and lack of access to ICT are widely recognized as an increasingly powerful obstacle to the economic, civic and political development of Africa. According to the UN ICT

Task Force, nowhere is the digital divide more pronounced than in countries of the African continent. Africa is the most unconnected in an increasingly connected world. This is where Ghana as a country finds itself E-learning can also be seen as a promising way for improving the quality of tertiary education and the effectiveness of learning. These promises can be derived from different characteristics of ICTs: the increased flexibility of the learning experience it can give to students; the enhanced access to information resources for more students; the potential to drive innovative and effective ways of learning and/or teaching, including learning tools, easier use of multimedia or simulation tools; finally, the possibility to diffuse these innovations at very low marginal cost among the teachers and learners. The radical innovation view was that fully online learning would progressively supersede traditional face-to-face learning and represent a competitive threat for traditional tertiary educational institutions. To some extent, this belief has been a reason for the creation of new ventures and for established institutions to enter this new market: early adopters could indeed possibly gain a brand name and a serious competitive advantage in the new market. The reality is that, while sometimes successfully experimented, fully online learning has remained a marginal form of e-learning and often not even the ultimate goal or rationale for e-learning adoption. However, this does not mean that e-learning in other forms has not gained significant ground over the past decade in tertiary education: there is indeed some evidence of a noticeable growth of e-learning adoption both on demand and supply sides. Distance E-learning has not only the virtue to be inclusive for students that cannot participate in tertiary education because of time, space or capacity constraints. It can also in principle offer to students more personalised ways of learning than collective face-to-face learning, even in small groups. Although learning is often personalised to some extent in higher education through the modularity of paths, ICTs allow institutions to give students to choose a wider variety of learning paths than in non-ICT supplemented institutions – not the least because of the administrative burden this would represent in large institutions [8]. This means that students can experiment learning paths that best suit them. Moreover, e-learning can potentially allow students to take courses from several institutions, e.g. some campus-based and others fully online. This possible flexibility of individual curricula can be seen as an improvement of the overall student experience, regardless of pedagogical changes. In one word, e-learning could render education more learner-centred compared to the traditional model.

## 4.0 Electronic Library

A prestigious university generally has a sizeable library gathering tons of codified information and knowledge. One of the most visible impacts of ICTs is to give easier and almost instant access to data and information in a digital form that allows manipulations that are sometimes not otherwise possible. The digitisation of information, from academic journals through to books and class notes, can change and has changed the life of students by giving them easy access to educational resources, information and knowledge, as well as new data processing possibilities.

The table below shows the frequency of the availability of electronic library resources:

LIBRARY RESOURCES	PERCENTAGES (%)
Provision of library	10
Accessibility of Information and Data	15
Availability of Journals and Books	15
Provision of Class Notes	30
Digitisation of Information	30

**Table 4.1:** Electronic library resources

#### 4.1 ICT and pupil's attainment

Six studies show statistical evidence that ICT can enhance attainment in subjects. UK's largest impact study shows a raise in subject performance through ICT use in English, science and design, and technology. Also specific ICT uses, such as interactive whiteboards in the UK, had a positive effect on pupil's performance in literacy, mathematics and science tests compared to students in other schools. They especially improved the performance of low achieving pupils in English and impact was greatest on writing. Another large impact of study in the UK which looked at ICT impact from an economic angle, confirms ICT investment impacts positively on educational performance in primary schools, particularly in English and less so on science but not in mathematics. On an international level, the analysis of the [7] PISA results indicates that longer use of computers by students is related to better results in mathematics in PISA results. As regards better results in national test, two other UK studies show that ICT can make a difference. Broadband access in classrooms is one necessary condition to benefit from new technologies for learning. It results in significant improvements in pupil's performance in national tests taken at age 16. Overall, evidence from the studies reviewed shows that attainment improves as a result of embedding ICT into teaching and learning. Schools with higher levels of immaturity demonstrate a more rapid increase in performance scores than those with lower levels. Most opinion based studies investigating ICT impact on student performance, such as the e-learning Nordic study, published in 2006, give a positive picture with teachers being convinced that pupil's subject related performance and basic skills (calculation, reading and writing) as well as educational achievements improve [10].

##### 4.1.1 Benefits to learners

An overwhelming majority of studies reviewed in this report confirm wider positive benefits of ICT on learning and learners, such as motivation and skills, concentration, cognitive processing, independent learning, critical thinking and teamwork. Increased motivation goes together with a positive learning attitude and leads for example to more attention during lessons with students being more involved in the learning activities. The fact that ICT enhances a more student-centred learning approach is often cited as among its most important benefits. The table 4.2 below indicates the benefits to learner.

BENEFITS	PERCENTAGES (%)
Motivation	15
Concentration	10
Cognitive Process	30
Independent learning	20
Critical thing	15
Teamwork	10
TOTAL	100

**Table 4.2:** Benefits of Learners

ICT can benefit likewise academically strong and weak students as well as students with special needs. Studies also reveal that the benefits can not only remain technology driven but should be more intentionally exploited following a pedagogical approach. Case studies show, for example, that teamwork does not automatically means increased collaboration. Many tasks which teachers called collaborative task merely involved pupils working alongside one another rather than jointly addressing a problem.

##### 4.1.2 Teachers and ICT usage

Despite the growing body of evidence on the impact of ICT use on learners, whether it will deliver its potential depends to a large extent on how teachers use ICT within the teaching and learning process. As the evidence shows impacting on teachers' practice have been proven to be a difficult endeavour. Whereas teachers estimate a high impact of ICT on learning and learning outcomes, the perceived impact on teaching methodologies is seen much more moderate. Most progress has been made in recent years in raising teachers' positive attitude towards ICT by realizing its value for learning through more experience and embedded use. Teachers increasingly use ICT to prepare their work more efficiently and achieve time gains. As the latest Euro barometer benchmarking survey (published in September 2006) 90% of teachers in Europe already use ICT to prepare their lesson [9]. There is also evidence of changes in roles of teachers either forced by the technology itself or more actively steered by teachers. In changing the teacher-student relationship, as part of the new educational paradigm, the most difficult process for teachers is to give up control and have more trust in students planning their work independently. The table 4.3 below indicates the frequency of the ICT approach in teaching and learning process.

APPROACH	PERCENTAGES (%)
Positive Attitude	12
Efficient Preparation	12
Time Achievement	15
Teacher-student relationship	13
Changing role	15
Teachers confident	15
Trust in student work plan	18
TOTAL	100

**Table 4.3:** Approach of teaching ICT learning process

Literature stresses the importance that each use of ICT needs a pedagogical approach to improve learning. On the other hand the overwhelming body of evidence shows that the majority of teachers have not yet embraced new pedagogical practices. Teachers do not feel confident yet in exploiting ICT to support new approaches in teaching. Most of the teachers are still in stage of using ICT to enhance existing pedagogical practice. Current pedagogy is subject centered, and uses ICT for differentiation and project based teaching in more advanced cases. Collaboration between students is not yet sufficiently exploited. An important research finding is that ICT impacts most in e-mature schools and with e-confident teachers, suggesting that once the foundations are laid the benefits will be considerable. The challenge is therefore to enable all teachers and schools to reach e-maturity.

## 5.0 Conclusion

There are many critical issues surrounding e-learning in tertiary education that need to be addressed in order to fulfil objectives such as widening access to educational opportunities; enhancing the quality of learning; and reducing the cost of tertiary education. E-learning is, in all its forms, a relatively recent phenomenon in tertiary education that has largely not radically transformed teaching and learning practices nor significantly changed the access, costs, and quality of tertiary education. As it has been shown, e-learning has grown at a rapid pace and has enhanced the overall learning and teaching experience. While it has not lived up to its most ambitious promises to stem radical innovations in the pedagogic and organisational models of the tertiary education, it has quietly enhanced and improved the traditional learning processes. Most institutions are thus currently in the early phase of e-learning adoption, characterised by important enhancements of the learning process but no radical change in learning and teaching.

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