

## COMPUTER LITERACY AND ICT LITERACY: THE CHANGING FACE OF LITERACY

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### Abstract

*Literacy as a term has become a dynamic concept and societal changes, especially advancements in the technological world have necessitated a continuous review of what the meaning of literacy should be. Computer literacy and Information and Communication Technology (ICT) literacy are revolutionizing the concept of literacy as the knowledge of the computer and ICT is beginning to feature prominently in the emerging definitions of literacy. Computer literacy and ICT literacy however, are two common forms of literacy often erroneously perceived to be synonymous. It is common to see these two terms used interchangeably. However, these two terms even though closely related, connote different technical meanings. This paper discusses the concept of literacy and how computer literacy and ICT literacy have come to bear in the emerging definitions of literacy. It also explores the technical meanings of the two terms by providing an aggregation of the views, assertions, and definitions expressed by experts to make a clear distinction between the two.*

**Keywords:** *Computer; Computer literacy; ICT; ICT literacy.*

### Introduction

The 21<sup>st</sup> century has witnessed tremendous achievements in the area of computer and Information and Communication Technology (ICT). All over the world, the computer and other ICT elements have taken over the work places since they have found application in virtually all human endeavours. Within minutes, financial transactions are brokered across continents through ICT driven banking technology, modern medicine has been greatly improved through telemedicine and events are monitored all over the world through digital satellite television technology. Indeed, ICT has turned the whole world into a global village.

The computer plays a central role in data collection, processing and dissemination. This makes it a key element of ICT. Personal Computers (PCs) have become a common tool in offices and shops, hence the demand for computer literacy or ICT literacy as the case may be, as a prerequisite for employment by employers of labour. There is also a growing awareness on the part of people on the need to be ICT compliant. It is also becoming increasingly difficult to be able to function in the society without any knowledge of the ICT. There is at the moment, so much emphasis on computer literacy, and ICT literacy and the two closely related terms are commonly used interchangeably, whereas there are clear demarcations between the two.

### The concept of literacy

The Oxford Advanced Learners Dictionary defines literacy simply as the ability to read and write. However, in extending the meaning of the word beyond this scope, the world literacy means different things to different people, and several definitions have been advanced for the word. According to Luke and Freebody (1999), there was no single definitive, truthful, scientific, universally effective, or culturally appropriate way of defining

literacy. A critical examination of the diverse social practices of literacy (Fagerberg-Diallo, 2001; Street, 2003) indicate that people acquire and apply literacy for different purposes in different situations, all of which are shaped by culture, history, language, religion and socio-economic conditions, and by extension work demand. There is also an emphasis on the dynamic nature of literacy. According to Needlman (2004), literacy is more than just being able to read and write. The Literacy Development Council of Newfoundland and Labrador (2011) submits that "Literacy not only involves competency in reading and writing, but goes beyond this to include the critical and effective use of these in peoples' lives, and the use of language (oral and written) for all purposes. According to the Council, the broad definition of literacy includes a variety of skills: reading text, document use, writing, oral communications, numeracy, thinking skills, computer use, working with others and continuous learning.

Luke and Freebody (1999) maintained that 'literacy is neither about skill development nor deep competence but the institutional shaping of social practices and cultural resources, about inducting successive generations into particular cultural, normative ways of handling texts, and about access to technologies and artifacts (e.g., writing, the Internet) and to the social institutions where these tools and artifacts are used (e.g., workplaces, civic institutions)'. Literacy therefore is a social practice and it widens a person's world, while illiteracy narrows it.

The United Nations Educational, Scientific and Cultural Organization (UNESCO) is an organization established by the United Nations (UN) to among other things set up world standard for education. UNESCO provided a generic definition of literacy mainly for use in international evaluations and to assist countries in coming up with their own specific definitions. According to UNESCO (2004), the first internationally agreed-upon definition, which is still often quoted, stems from UNESCO's position in 1958 concerning the International Standardization of Educational Statistics. It states that a literate person is one who can, with understanding, both read and write a short simple statement on his or her everyday life. Another much-criticized but often-used definition is that given by the same organisation in 1970, according to which a functionally literate person is defined as one who can engage in all those activities in which literacy is required for the effective functioning of his or her group and community and also for enabling him or her to continue to use reading, writing and calculation for his or her own and the community's development (UNESCO, 2004).

However, the recommended definition of literacy employed in the Education for All 2000 Assessment is one in which literacy is defined as "the ability to read and write with understanding a simple statement related to one's daily life. It stated further that literacy involves a continuum of reading and writing skills, and often includes basic arithmetic skills (numeracy)." UNESCO as a dynamic organisation still considered this definition inadequate to cater for the complexity and diversity of literacy across the spectrum of its acquisition and application. Therefore, in June (2003), during an international expert meeting, UNESCO proposed another definition, particularly for measurement purposes (UNESCO, 2004). This definition states that 'Literacy is the ability to identify, understand, interpret, create, communicate and compute, using printed and written materials associated with varying contexts'. It was further stated that literacy involves a continuum of learning in enabling individuals to achieve their goals, to develop their knowledge and potential, and to participate fully in their community and wider society." For the purpose of this paper, this definition is adopted and computer literacy and ICT literacy are examined on the basis of this definition.

This is because in modern day world, it is difficult for anyone to achieve his goals, develop his knowledge and potential, and participate fully in his community and wider society without any form of interaction with ICT.

This definition makes it apparent that literacy, within the context of the definition, has gone beyond just being able to read and write. UNESCO has come to realise that with the level of advancement of the human race, it may be difficult for anyone to survive if all he could do is just read and write. In today's world, knowledge of the computer and other ICTs is needed to be able to do all that this definition requires of a literate person. It therefore means that literacy has been extended to include the ability to use computers and other ICTs.

Human survival goes beyond reading and writing, and another dimension that has been added to the concept of literacy as exemplified in this definition by UNESCO is the idea of 'communication and computation'. Modern day communication and computation involves the use of computers and ICT. For instance, with the advancement brought into communication through the use of the Global System of Mobile Communication (GSM), it is pretty difficult for anyone to get along in the society without the basic knowledge of effective use of mobile phones. Inability to use mobile phones, resulting from illiteracy is a serious setback for any individual and it may be impossible to get along well in the society and achieve one's goals without the ability to use this very important technology.

According to Hiebert (1991), the new perspective of literacy does not consist of old ideas with a new name, but rather it represents a profound shift from a text-driven definition of literacy to a view of literacy as active transformation of texts. Some degree of relativity has also been brought into the concept of literacy based on the submission of Langer (1991) that the standards for literacy depend on the context within which one functions. Langer (1991) further submits that 'it is the culturally appropriate way of thinking, not the act of reading or writing that is most important in the development of literacy'. The use of computers and ICT has become a global culture and this is why computer literacy and ICT literacy have become global phenomena.

Sequel to the changing nature of the concept of literacy which widens its connotation beyond just being able to read and write, the New London Group (1996) submitted that due to the numerous channels of communications and the ever increasing cultural and linguistic diversity in the world today, the need for a broader view of literacy than portrayed by traditional language-based approaches became necessary. Thus the emergence of a broader term called 'multiliteracy'. According to them, 'Multiliteracies, overcomes the limitations of traditional approaches by emphasizing how negotiating the multiple linguistic and cultural differences in our society is central to the pragmatics of the working, civic, and private lives of students' (p1). Alothman (2005) referred to multiliteracies as a revolution in education leading to inevitable major shifts or changes in pedagogy related to technology and human values. He further stated that the purpose of multiliteracies is to extend literacy teaching for our new times, i.e. creating lifelong learners who are FIT (Fluency in Information Technology) and able to live with confidence in a new constantly changing society or world (p1). Thus a major dimension that has been brought into the definition of literacy is information technology, which we cannot talk about without talking about computers and which has been further extended as ICT. The interrelationship between computer literacy and ICT literacy calls for the drawing of lines of distinction between the two.

## Computer and ICT

According to Bandele (2007), the computer is a data processing electronic machine that generates meaningful information as output. It is often commonly defined as an electronic device that is capable of accepting, processing, storing and retrieving information at great speed, accuracy and precision. They come in various shapes and sizes and some are customised only for specific purposes. Modern computers are actually small enough to fit into mobile devices, and can be powered by a small battery like we have in mobile handsets. An all general-purpose computer requires memory which enables a computer to store, data and programs, and mass storage [device](#) which enables a computer to permanently retain a heavy data.

ICT as a term has a long history and many definitions have been advanced for it. Parker (1974) defined ICT as a collection of technologies that deal specifically with processing, storing, and communicating information, including all types of computers and communication systems as well as reprographic methodologies. In his own assertion, Okwor (2002) described ICT as the use of computer and telecommunication system in the collection, collation, analysis, processing, manipulation, storage, retrieval, transmission, and communication of data in different forms.

More recently, Gay and Blades (2005) stated that ICT encompasses the effective use of equipment and programs to access, retrieve, convert, store, organize, manipulate and present data and information while the University of Queensland, Australia (2008) referred to ICT as a term that covers all forms of computer and communication equipment and software used to create, store, transmit, interpret and manipulate information in its various formats. In his own assertion, Bandele (2007) viewed ICT as the scientific methods of storing and processing information and correspondingly sharing, exchanging and sending or moving such information from one place to the other. He stated further that ICT should be seen not from the ordinary use of modern electronic equipment like radio or television, but from the new communications and telecommunications technologies that use the interconnectedness of computer resources and supporting equipment to process, manage and transfer information, identifying the internet as the undisputable single technology of our age that drives the information and communication technology. Oyelekan and Olorundare (2009) expressed the view that the use of computers has dominated human activities especially in the last two decades and that its use is complemented by a whole lot of other electronic devices, all of which are now collectively regarded as Information and Communication Technology (ICT).

ICT is therefore a collection of a wide range of electronic devices like the computer, the internet, CD-ROMS, audio tape, television set, electronic mail, telnet, digital calculator, V-sat, wireless audioroliograph, telephone, radio, optic fibres, satellite equipment, digital multimedia, mobile phones, and the Internet, all of which can be used for collecting, collating, analysing, processing, storing, manipulating and transmitting information. Electronic devices such as the telephone, cameras, communication satellites, videos, compacts discs, and video discs are also elements of ICT. It is however important to note that the first item that comes to mind when ICT is mentioned is the computer. The computer is central to ICT. This is because of its capability to work with and be used to manipulate other elements of ICT.

The property of communication in the form of information transmission differentiates between ICT and the computer. A computer may not be fortified with the capability of

information transmission, but can be used to store, manipulate, and process data. It remains a computer and not an ICT. However, when the property of a computer goes beyond storage and manipulation of information to the capability of transmitting information over a considerable distance, a more appropriate term to be used is ICT. For instance, a laptop is a computer; however, once it is connected to the internet through which information can be disseminated, it becomes an ICT gadget. Similarly, a mobile telephone handset is an ICT device because it has a computer component, and a communication component working together.

### **Computer literacy and ict literacy**

A combination of the literary meanings of 'computer', and 'literacy' may not give a satisfactory meaning of computer literacy. The Oxford Advanced Learners Dictionary defines computer literacy simply as the ability to use computers well. From the earlier perspectives of the meaning of computer literacy, computer literacy is not just an individual's ability to operate a computer, but the problem-solving outcomes of this ability. In having a broad knowledge of the meaning of computer literacy, it is important to have a historical overview of previous attempts at defining computer literacy.

There have been many definitions in the past for computer literacy but all have shared common themes. Scher (1984) described computer literacy as "appropriate familiarity with technology to enable a person live and cope in the modern world". About the same time, Hunter (1984) also described computer literacy as "the skills and knowledge needed by a citizen to survive and thrive in a society that is dependent on technology for handling information and solving complex problems". Loyd and Gressard (1984) believe that computer literacy should be measured based on the amount of time spent on the computer, ownership of the computer, and number of computer related courses taken. In their own assertion, Simonson, Maurer, Montag-Torardi, and Whitaker (1987) defined computer literacy as an understanding of computer characteristics, capabilities and applications, as well as an ability to implement this knowledge in the skilful and productive use of computer applications suitable to the individual roles in society.

Jones (1997) did a general overview of some works in computer literacy, and listed a number of 'universal' understandings for computer literacy programmes as follows:

1. A knowledge of computer theory, including some knowledge of how computer hardware makes possible and constrains the things a computer can accomplish.
2. A knowledge of the history and development of computers.
3. A knowledge of what a computer is and what it is capable of doing.
4. The ability to apply computer skills and tools to the problems of everyday life at work and in the home. Here, computer literacy means "the ability to process information in support of the decision-making process"
5. The ability to control a program and a computer to achieve a variety of personal, academic, and professional goals (Jones, 1997).

Mitra (1998) defined computer literacy as the amount of computer knowledge acquired in the past and the length of computer usage. Mitra (1998) was therefore of the opinion that irrespective of the amount of computer knowledge an individual might have acquired, the length of the period of use counts into the individual's level of computer literacy. However, while the length of use could be a measure of the level of problems solved

through its use, this might not be true all the time for it is possible to spend so much time operating the computer, with limited productivity. It is also a factor of what and what the computer is being used to do. For instance, a lot of time could be spent on the computer just playing games.

According to Oliver and Towers (2000), the term computer literacy has long been used as a description of people's skills and predisposition to the use of computers and information technologies. Computer literacy can also be referred to as the comfort level someone has with using computer programs and other applications that are associated with computers. This includes knowing how computers work and operate. O'Connor, Anderson, Bynum, Gaston, Guimaraes de Castro et al. (2002) illustrated the foundational set of skills and knowledge that underlie ICT literacy:

1. cognitive proficiency and
2. technical proficiency.

According to them, cognitive proficiency has to do with the desired foundational skills of everyday life at school and workplaces. This proficiency is demonstrated in literacy, numeracy, problem-solving, and visual literacy. On the other hand technical proficiency includes a foundational knowledge of hardware, software applications, networks, as well as elements of digital technology. The integration and application of cognitive and technical skills is referred to as ICT proficiency. More recently, Technological Fluency Institute, Pittsburg (2010) defines computer literacy as the knowledge and ability to use computers and technology efficiently. According to the institute, the highest goal of a computer-literate person is to be able to learn and use new computer programs without large amounts of help. The institute believes that computer literacy gives people of all ages an edge in both their careers and education.

A critical examination of the various definitions shows that computer literacy involves computer knowledge acquisition, computer operation, and problem solving. In other words, a computer literate person should have acquired some basic theoretical knowledge of the computer, be able to operate certain computer programs and in the process provide solution to specific problems.

In recent years, many have argued the need for a more embracing definition for the term which assumes attributes beyond computing competency (eg. Bigum & Green, 1992). However, competencies and skills still remain the core elements of computer literacy. The duo of Bigum and Green (1992) still provide the basis for explorations of the extent and scope of computer applications and uptake among the different cohort of computer users. The emerging use of the broader term of ICT literacy has at its roots in the need to include more recent dimensions of technology brought about by such developments as networks and the Internet. The use of a range of communication tools such as e-mail, video-conferencing and the World Wide Web (WWW) for the location of information, and the subsequent dissemination of information are now reasonably considered to be components of ICT literacy and yet not necessarily that of computer literacy (Oliver & Towers, 2000). In addition, many of the skills, which previously had been associated with those that an individual would need to have acquired in order to be considered computer literate, are often now seen to be components of the more encompassing term of ICT literacy.

The Australian Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) defined ICT Literacy as “the ability of individuals to use ICT appropriately to access, manage, integrate and evaluate information, develop new understandings, and communicate with others in order to participate effectively in society” (MCEETYA, 2005). The framework that elaborated this definition referred to six key processes in ICT Literacy: accessing information; managing information; evaluating information; developing new understandings; communicating; and using ICT appropriately. This view of ICT literacy emphasises the interaction of information literacy with computer technology. Since 2005, ICT literacy has become increasingly regarded as a broad set of generalisable and transferable capabilities that are used to manage and communicate cross-disciplinary information and the integration of information and technology is seen to transcend the application of ICT within any single learning discipline (Markauskaite, 2007). According to Catts and Lau (2008) “people can be information literate in the absence of ICT, but the volume and variable quality of digital information, and its role in knowledge societies, has highlighted the need for all people to achieve information literacy skills”.

This paper goes along with the contemporary view of ICT literacy, as the set of skills and understandings required by people to enable meaningful use of ICT appropriate to their needs. In fact, most definitions of ICT literacy include a breakdown of the knowledge and skills of a computer literate person. These typically are categorised in ways, which facilitate some form of measurement and assessment. This breakdown often provides further insights into understandings of the terms and concepts. For example, Simonson et al. (1987) discussed four categories as critical elements of computer literacy: computer attitudes, computer applications, computer systems, and computer programming. In contemporary views many of these elements are part and parcel of ICT literacy although more recently, writers have moved to more functional description.

## **Conclusion**

The various dimensions, in which literacy has been earlier on defined in this paper, make it apparent that literacy is not just the ability of an individual to read and write as it is often believed. The utilisation of this ability in solving the individual’s personal, professional, and community problems is part and parcel of literacy. This paper posits that technically, the capability of a computer excludes the ability to transmit information from one place to another, unless it is connected or equipped with communication technology, in which case it is better referred to as an ICT. Modern day computers are equipped with component parts that can make them interact with communication devices to transmit information. This does not make them to be comfortably referred to as ICT as they can only be so referred if they can transmit information on their own, without any accompanying communication technology. For instance, a desktop computer or laptop that is not connected to the internet, or fortified with the Bluetooth technology cannot transmit information. Once it is connected to the internet or has a Bluetooth technology in it, it is better referred to as an ICT. Hence, the line of distinction between a computer and an ICT is the property of being able to transmit information. A computer will ordinarily not be able to transmit information, an ICT would do and a computer can be involved.

This paper also posits that computer literacy is a narrower term and basically refers to proficiency on the use of computers, excluding one’s ability to use it for transmitting information. ICT literacy subsumes proficiency on the use of computers and extends this to the ability to use computers with communication technologies to transmit and receive

information over a wide range. Computer and ICT literacy are not limited to an individual's ability to operate computers and other ICT gadgets alone, but his ability to solve his personal, professional, and community problems through the deployment of his expertise in computer and ICT operations.

## References

- Alothman, B. (2005). What is multiliteracies? Retrieved April 26, 2011 from <http://multilit2fit.blogspot.com/2005/09/what-is-multiliteracies.html>.
- Bandele, S. O. (2007). *Development of modern ICT and internet system*. In Alonge M. F. (eds). *Information and communication technology (ICT) and computer applications*. Ado-Ekiti: University of Ado-Ekiti Press.
- Bigum, C. & Green, B. (1992). Technologising literacy: The dark side of the dream. *Australian Journal of Educational Studies*, vol. 12, 2, 4-28.
- Catts, R., & Lau, J. (2008). *Towards information literacy indicators*. Paris: UNESCO.
- Fagerberg-Diallo, S. 2001. Constructive dependence: The response of a Senegalese community to the question of why become literate. In: D.R. Olson and N. Torrance (eds.) *The making of literate societies*. Malden, Mass/Oxford, Blackwell.
- Gay, G., & Blades, R. (2005), *Information technology for CXC CSEC*. Oxford: Oxford University Press.
- Hiebert, E. H. (1991). Introduction. In E. H. Hiebert (ed.). *Literacy for a diverse society: Perspectives, practices, and policies* (pp. 1-6). New York: Teachers College Press.
- Hunter, J. (1984). Make your students computer literate. *Business Education Forum*, Vol. 4, pp. 45-50.
- Jones, B. (1997). Computer literacy. Retrieved January 4, 2011, from [http://communications.ucsd.edu/bjones/comp\\_lit\\_paper.html](http://communications.ucsd.edu/bjones/comp_lit_paper.html).
- Langer, J. A. (1991). Literacy and schooling: A sociocognitive perspective. In E. H. Hiebert (Ed.). *Literacy for a diverse society: Perspectives, practices, and policies*. (pp. 9-27). New York: Teachers College Press.
- Loyd, B., & Gressard, C. (1984). The effect of sex, age, and computer experience on computer attitudes. *AEDS Journal*. 18, (2), 67-76.
- Luke, A. & Freebody, P. (1999). Further notes on the four resources model. Retrieved May 4, 2011, from <http://www.readingonline.org/research/lukefreebody.html>
- Markauskaite, L. (2007). Exploring the structure of trainee teachers' ICT literacy: the main components of, and relationships between, general cognitive and technical capabilities. *Education Technology Research Development*, 55, 547-572.
- Ministerial Council on Education, Employment, Training and Youth Affairs (MCEETYA) (2005). *National Assessment Program Information and Communication Technology Literacy Years 6 and 10: An Assessment Domain for ICT Literacy*. Carlton: Curriculum Corporation.
- Mitra, A. (1998). Categories of computer use and their relationships with attitude toward computers. *Journal of Research in Computing in Education*. 30, (3), 281-292.
- Needlman, R. (2004). What is literacy? Retrieved May 2, 2011 from <http://www.drspock.com/article/0,1510,5133,00.html>
- O'Connor, Anderson, Bynum, Gaston, Guimaraes de Castro (2007). *Digital transformation, a framework for ICT literacy: A report of the International ICT literacy panel*. New Jersey: Educational Testing Service.
- Okwor, F. A. (2002). Science and technological issues for education in the information age. *Interdisciplinary Education Journal (INTEJ)*, 5, 523-525.
- Oliver, R., & Towers, S. (2000). Benchmarking ICT literacy in tertiary learning settings.

- Retrieved February 21, 2011, from <http://citeseerx.ist.psu.edu/viewdoc/download?doi=10.1.1.17.8052&rep=rep1&type=pdf>.
- Oyelekan, O. S., & Olorundare, A. S. (2009). Development and validation of a computer instructional package on electrochemistry for secondary schools in Nigeria. *International Journal of Education and Development Using ICT*, 5(2). Retrieved June 2, 2011, from <http://ijedict.dec.uwi.edu/viewarticle.php?id=677&layout=html>
- Parker, S. P. (1974). *Dictionary of scientific and technology terms*. New Jersey: McGraw-Hill.
- Scher, R. (1984). The computer backlash. *Electronic Learning*, 5, 23-27.
- Simonson, M. R., Maurer, M., Montag-torardi, M. & Whitaker, M. (1987). Development of a standardised test of computer literacy and computer anxiety index. *Journal of Educational Computing Research*, 3(2), 231-247.
- Street, B. V. (2003). What's 'new' in new literacy studies? Critical approaches to literacy in theory and practice? *Current Issues in Comparative Education*, 5, (2), 17-28.
- Technological Fluency Institute, Pittsburgh. (2010). What is computer literacy? Retrieved June 2, 2011, from <http://www.techfluency.org/computer-literacy.htm>
- The Literacy Development Council of Newfoundland and Labrador. (2011): Call for nominations. Retrieved June 2, 2011, from [www.gov.nl.ca/edu/2011\\_literacy\\_award.pdf](http://www.gov.nl.ca/edu/2011_literacy_award.pdf)
- The New London Group. (1996). A pedagogy of multiliteracies: Designing social futures. *Harvard Educational Reviews*, 66(1), 60-92. Retrieved May 2, 2011, from [http://wwwstatic.kern.org/filer/blogWrite44ManilaWebsite/paul/articles/A\\_Pedagogy\\_of\\_Multiliteracies\\_Designing\\_Social\\_Futures.htm](http://wwwstatic.kern.org/filer/blogWrite44ManilaWebsite/paul/articles/A_Pedagogy_of_Multiliteracies_Designing_Social_Futures.htm)
- UNESCO (2004). The plurality of literacy and its implications for policy and programmes. *UNESCO education sector position paper*. Paris: UNESCO.
- University of Queensland (2008). What is ICT? Retrieved December 4, 2010, <http://www.uq.edu.au/ict/what-is-ict>.