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RESEARCH ARTICLE

USE OF INFORMATION AND COMMUNICATION TECHNOLOGY IN TEACHING AND LEARNING IN EMERGENCY SITUATIONS: RELEVANCE, CHALLENGES AND ETHICAL CONCERNS

Fr. Aloysius Ezeanolue[1], Dr. Ezewuzie Jideofor J.[2] and Fr. Dr. Greg Ekeh[3]

1. Department of Educational Foundations Nnamdi Azikiwe University, Awka.
2. Department of Educational Foundations Federal College of Education (T) Umunze, Anambra State.
3. Department of Educational Foundations Nnamdi Azikiwe University, Awka.

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Abstract

This study sought to ascertain the relevance of the use of information and communication technology (ICT), its challenges and ethical concerns in teaching and learning in in emergency situations. Some instances of such situations are natural disasters and outbreak of diseases. A case in hand about such diseases is the current Corona Virus Pandemic. Using a qualitative method of conceptual frame and critical analysis, the paper explored the meanings and imports of technology, information technology, communication technology and information and communication technology, in reference to teaching and learning in emergency situations. It was discovered that these concepts, though interrelated, are not exactly the same, and that information and communication technology is better understood in the light or backdrop of technology itself. The components of ICT were discussed, leading to the ascertainment of the relevance of and challenges to ICT in teaching and learning in emergency situations, as well as ethical issues emanating from the use of ICT. In the course of the analytical exploration, the roles of stakeholders such as parents, teachers, students and the government were highlighted. Based on the insight gained from the discourse, the paper came to a conclusion that the relevance of the use of ICT in teaching and learning in emergency situations is indisputable, but not without some challenges. Although ethical issues constitute a challenge of its own in the context of ICT, it is believed that their proper understanding and application by various stakeholders, especially teachers and students, will be of immense help in overcoming other challenges facing the use of ICT in teaching and learning. In the light of the conclusion arrived at, the paper recommended, among others, that teachers at all levels of education be well knowledgeable in the use of ICT in teaching and learning, with its ethical concerns, so as to be able to guide students properly, and students endeavor to be discreet in their use of the internet, while government should legislate and provide enabling environments that will make online teaching and learning thrive in emergency situations.

Corresponding Author:- Fr. Aloysius Ezeanolue
Address:- Department of Educational Foundations Nnamdi Azikiwe University, Awka.

Introduction:-

Education is a critical requirement for building and sustaining a knowledge-based society that can stimulate development, economic growth and prosperity. Without education, a knowledgeable society cannot be realized. Emergency situations such as outbreak of diseases, natural disasters and other emergency situations are unforeseen occurrences in human existence, with their attendant distasteful effects. In such situations, teaching and learning usually suffer some setbacks. However, teaching and learning, being the fulcrum of educational process, must find ways to thrive, despite these emergencies. Information and communication technology (ICT) is needed to ensure continuity in teaching and learning process, especially in such situations. ICT, through online teaching and learning, can close problematic gaps in teaching and learning which these emergencies usually create.

In the context of teaching and learning, information and communication technology refers to that set of technologies for collecting, storing, processing, communicating and transmitting of information (Adebayo and Nafisat, 2016) involving the teacher and the learner. Information and communication technology involves handling and processing all kinds of information using relevant and appropriate electronic devices (FGN, 2004). According to Akindolu (2002), information and communication technology centred in education (teaching and learning) involves the use of computers, online self-learning packages, compact discs, satellites, optical fiber technologies, telepresence system and different types of hardware and software.

The worldwide web (www) is used for sourcing information, whereas the e-mail (electronic mail) is used for exchanging instant mails between a teacher and his students (Adebayo and Nafisat, 2016). Adu, Emunemu and Oshati (2014) maintain that the use of ICT in education (teaching and learning) helps in information retention, greater motivation and increase in understanding. Thus, information and communication technology becomes imperative for the continuity of teaching and learning in emergency situations such as the outbreak of diseases and natural disasters. Nevertheless, teaching and learning in emergency situations has some moral implications, both for the teacher and the learner.

There is no doubt that the use of information and communication technology in teaching and learning, especially in emergency situations, has been considered relevant, as advancement in technology keeps making inroads into all facets of human activities. For instance, ICT avails both teachers and students with diverse sources of information, encourages collaboration and knowledge retention. However, the use of ICT in emergency situations is also faced with some challenges, as well as ethical concerns. These will be critically discussed in this paper, after a conceptual clarification and analysis of ICT and its components in reference to teaching and learning in emergency situations. The aim of the entire discourse is to enhance the use of ICT in teaching and learning in emergence situations, for greater knowledge and skill acquisition, benefits of the teachers, the learners and the society at large.

Information and Communication Technology in Reference to Teaching and Learning in Emergency Situations

A clear understanding of ICT is very important in a study of this nature. It is believed that the grasp of the fundamental meaning will certainly pave way for our understanding of the entire discourse. The meaning is not new to us, so to say, but since its usage appears imperative and fundamental here, it is necessary to give various articulations of the term so as to serve the purpose of this work and equally help to facilitate the discussion of the topic.

Technology

In teaching and learning, technology is most simply and comfortably defined as an array of tools that might prove helpful in advancing students' learning, and may be measured on how and why individuals behave the way they do. Educational Technology relies on broad meaning of the word "technology". Thus, technology can refer to material objects of use to humanity such as machines or hardware, but it can also encompass broader themes, including systems, methods of organization, and techniques. Some modern technologies in teaching and learning are not limited to overhead projectors, laptops, desktops other forms of computers and calculators. Newer tools such as smart phones and games (both online or offline) are beginning to draw serious attention to their learning potentials.

Information Technology

Information technology is a term used to describe the items of equipment (hardware) and computer programs (software) that allows us to access, receive, retrieve, store, organize, manipulate and present information by

electronic means. Personal computers, scanners and digital cameras fit into the hardware category, while database, computer programmes, and multi-media programmes fit into the software category (Collins, 2009).

Communication Technology
This is a term used to describe telecommunications equipment through which information can be sought, sent and accessed. Examples include phones, faxes, modems and computers. Communication technology therefore facilitates easy transmission of data and information from a given source to a given destination. Often communication technology provides a two-way transmission process, thus giving way for reception and for feed-back as well (Collins, 2012).

Information and Communication Technology
This represents the convergence of information technology and communication technology. Information and communication technology (ICT) is the combination of networks, hardware and software as well as the means of communication, collaboration and engagement that enables the processing, management and exchange of data, information and knowledge. ICT, therefore, describes those electronic gadgets, including software, that facilitate the reception, processing, transmission, transfer and retrieval of information or data as and when needed (Fuchs, 2004).

Federal Republic of Nigeria, (2014) explains that ICT involves handling and processing of information using all kinds of electronic devices. These electronic devices can be used for broadcasting, telecommunications and all forms of computer assisted communications.

ICT-centred teaching and learning in emergency situations covers the use of computers, online self-learning packages, interactive compact discs, satellites, radio, optical fiber technologies, tele presence systems and all forms of ICT hardware and software (Akudolu, 2002). Information and communication technologies are electronic technologies used for information storage and retrieval. Olasupo (2011) states that ICT in a wider educational setting includes all media of mass communication, but that with the recommendation of National Policy on Education 2014 on the use of ICT in teaching and learning in emergency situations, the focus should be on the use of computer internet through its browsing facilities.

Information and communication technology can also be understood as the combination of informatics technology with other related technologies to process and communicate information (UNECSCO, 2002). ICT is a term which stresses the role of unified communications 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. The term is also used to refer to the convergence of audio-visual and telephone networks with computer networks through a single cabling or linkage system. Wikipedia states that ICT in a broad sense covers products that will store, retrieve, manipulate, transmit or receive information electronically in a digital form. Examples are personal computers, digital televisions and e-mail. UNESCO, (2012) describes ICT as a type of technology that is used specifically for communications; it is like information technology (IT), but ICT focuses more on technologies that deal with communication like cell phones, internet and wireless networks, among others.

Information and Communication Technology Components in Reference to Teaching and Learning in Emergency Situations

Information and communication technology components refer to the materials needed for successful use of ICT in teaching and learning in emergency situations. Olasupo (2011) outlines the under listed as such materials:
1. Browsing Environment (BE), consisting of ICT centre connected to internet service provider (ISP).
2. Personal Computers (PC), such as Desktop, Laptop or Palmtop.
3. WEB Application Software (WAS), such as Microsoft, Internet Explorer, Google Chrome, Opera Mini, Youtube.

New Partnership for African Development (NEPAD) has launched the e-school initiative intended to equip all African schools with ICT facilities such as computers, radios and televisions, phones and fax machines, communication equipment, scanners, digital cameras, copiers among others (Adebayo and Nafisat, 2016). UNESCO (2012) lists the components of ICT as: computers, desktops, laptops, networks, internet, hard disc drives, tablets, routers, slates, digital cameras, camcorders, memory cards, interactive data projectors, digital video discs,

sensors, compact discs, televisions, radios, flash drives, voice over internet protocol, camera phones, instant messaging, mobile phones and e-mail.

Relevance of ICT to Teaching and Learning in Emergency Situations

Since the advent of science and technology, there have been relentless efforts to enhance teaching and learning through the application of information and communication technology. In this regard, the relevance of ICT to teaching and learning has been gaining ground, especially in emergency situations. As outlined by Yusuf (2015), ICT is relevant to teaching and learning in emergency situations in the following ways:

1. Fostering students' interest and motivation.
2. Promoting students' commitment to learning.
3. Making the learning more exciting and interesting for both teachers and students.
4. Introducing concepts of new learning (such as online packages which give students greater control over what they learn and how they learn).
5. Bringing students and teachers together for lectures and tutorials across geographical locations.

Promoting distance learning.

Lots of information are accessed through internet browsing. According to Olasupo (2011), these include data, notes, diagrams, images, videos, animation, quizzes, puzzles, games and so on. He states that these in turn can be used to present a given lesson in an interesting way to the students, remove abstractions from some concepts, summarize the lesson (for example with diagrams), and test the students' mastery of the concepts in the topic taught. In the same line of reasoning, Adu, Emunemu and Oshat (2014) maintain that ICT is relevant to teaching and learning in emergency situations in that it helps students to easily obtain resources or information with a click of the button, type their queries and get relevant results within a matter of seconds, learn to become effective and independent learners, and gets them ready for their future.

Students usually enjoy using computers or tablets to learn; thus teachers can upload their quizzes, notes or even feedback forms in such platforms as ASKnLearn. Using ICT in teaching and learning in emergency situations gives the students a head start for their future by helping them to stay relevant, as well as use computers to do effective researches, and this puts them a step up in the heavily competitive job market.

By using computers, assignments are posted and submitted online. This conserves and protects the environment by reducing the rate at which trees are cut down for the purpose of making papers. Moreover, ICT places all students on equal footing with the right hardware, software and curriculum.

The use of ICT in teaching and learning in emergency situations gives greater exposure to vocational and workforce skills for students, creates greater enthusiasm for learning among them and prepares them for real life situations in the wider society. It provides learners with online educational materials and additional resources to assist resource-based learning. It equally provides teachers with new sources of information and knowledge as well as opportunities for multiple technologies delivered by teachers (Mikre, 2011). Mikre further states that the overall relevance of ICT in teaching and learning in emergency situations are as follows:

Producing people capable of working and participating in the new economies and societies arising from ICTs and related developments.

Leveraging ICT to assist and facilitate learning for the benefit of all learners and teachers across the curriculum.Improving the efficiency of educational administration and management at every level. Providing access to quality education services for learners. Setting specific criteria and targets to help classify and categorize the different development levels of using ICT in teaching and learning in emergency situations.

The relevance of ICT in the global domain, especially in the area of teaching and learning, can never be overemphasized, for development targets. UNESCO (2012), through its organized World Summit on Information Society (WSIS) in conjunction with International Telecommunication Union (ITU), strongly emphasizes this, pointing out such development targets to include the following:

1. To connect villages with ICT and establish community access links.
2. To connect universities, colleges, secondary and primary schools with ICTs.
3. To connect scientific and research centres with ICT.

4. To connect public libraries, cultural centres, museums, post offices and archives with ICT.
5. To connect health care centres and hospitals with ICT.
6. To connect all local and central government departments with ICT and establish websites and e-mail addresses.
7. To adapt all primary and secondary curricula to meet the challenges of information society.
8. To ensure that the entire world population has access to television and radio services.
9. To encourage the development of content and put in place technical conditions in order to facilitate the presence of all world languages in the internet.
10. To ensure that more than half of the world inhabitants have access to ICTs within their reach.

The use of ICT in teaching and learning in emergency situations provides the possibility of bridging knowledge gaps often experienced in the process of education. The use of ICT increases the quality of education and multiplies the quantity of excellent educational prospects. ICT makes the acquisition of knowledge much easier by providing means to resources and greater reach to people.

Challenges Confronting the Use of ICT in Teaching and Learning in Emergency Situations

The use of ICT faces challenges in terms of capacity, capabilities and resources (human and financial) in a bid to successfully and effectively ensure teaching and learning in emergency situations. Some of these challenges are worth highlighting as discussed below:

Policy Environment:

Sometimes government policies fall short of making adequate provision, support and enabling environment for the availability and usage of ICT in education. This seriously affects its application in teaching and learning in emergency situations. It is worthy of note that the creation of a strong enabling policy environment is required for the use of ICT in teaching and learning in emergency situations.

Infrastructure:

Many African countries, including Nigeria, face the problem of unreliable power supply, uncompleted networks for data and telecommunications, coupled with the high cost of energy and telecommunications. For example, the Economic Community of West African States (ECOWAS) notes that its countries face the serious challenge of affordable and accessible telecommunication backbone and stable electricity supply. This lack of affordable and accessible telecommunication backbone and a stable electricity supply impacts negatively on the rollout of ICT in teaching and learning in emergency situations.

Funding/Budget Allocation:

ICT does not feature high on the list of education institutions' investment or priorities when compared to other items like paying staff salaries or maintaining utilities. There is poor government funding of e-learning initiatives. Instead of adequate funding by government, there is much undue reliance and dependence on donor agencies and other surrogate funding schemes. Hence, the use of ICT in teaching and learning in emergency situations is adversely affected.

Shortage of Trained Professionals and Educators:

Harnessing technologies for teaching and learning in emergency situations requires continued investment in supporting educators to create these new learning environments. Educators play a pivotal role in the use of ICT in teaching and learning in emergency situations. The Ministry of Education has limited skilled human resources capable of using ICT in teaching and learning in emergency situations. Schools in Nigeria face a critical shortage of skilled workers who understand basic and advanced programming to plan, design, implement and distribute information systems and handle teaching and learning in emergency situations.

Materials Development:

Short supply of appropriate and improvised contents ranging from learning materials to learning support tools hampers the effective utilization of ICT in teaching and learning in emergency situations. Materials such as radio, audiotape, and multimedia packages are in short supply in education system. The dearth of these materials are, for example, evident when one compares African education systems to the developed world.

Bandwidth Constraints:
The most obvious obstacle to the use of ICT in teaching and learning in emergency situations remains access to higher bandwidth. In countries like South Africa and Egypt which have relatively high ICT capacities, internet bandwidth is very congested. Hence, the use of ICT in teaching and learning in emergency situations is adversely affected.

Ethical Concerns in the use of ICT in Teaching and Learning in Emergency Situations
Online teaching and learning in emergency situations through information and communication technology (ICT) is usually associated with some philosophical, managerial, organizational, and technical encumbrances. Some teachers, therefore, approach online teaching with some form of sincere fear. There is, for instance, the concern about quality of instructions. The most distinctive feature of a good learning experience is interaction between learners and teachers. To accomplish this will be determined primarily by variables such as teacher's skills and class size, especially when the interaction is mediated via computer. Computer facilitated online teaching and learning is usually tasking, time consuming and capital intensive. Teachers ought to build and maintain websites, receive and respond to e-mails and stay abreast of the ever-changing events in the world of technology.

Economically disadvantaged learners cannot afford electronic technology facilities such as a personal computers or internet services. These financially challenged learners may not be able to participate in the online teaching and learning in emergency situations. Government ought to provide these financially challenged learners with electronic technology facilities to enable them participate in such situations.

Moreover, it takes a long time to build great websites. In the web age, copyright laws ought to be obeyed before copying things onto the website. Again, it takes a long time to download, since attached files can carry viruses or get corrupted. Technically, server can be unreliable sometimes. Plug-ins and sound cards necessary for audio-visual can also be problematic.

Human weakness exists, and can also be a point of consideration here. Frustrations often experienced in the online teaching and learning do not always occur as a result of the inherent limitations of technology, but due to inconsistencies in the human capacity and willingness to interact with technology. Learners can unintentionally delete messages and would want them resent, and teachers can also unintentionally delete learners' e-mails. At times learners send e-mails that are not identified, while some even forget their passwords, and so find it difficult to log in. Furthermore, many learners tend to be lazy about checking their e-mails regularly. Lastly, most learners clutter the discussion with irrelevant points and unnecessary comments.

The above insight borders on ethical concerns regarding the use of ITC in teaching and learning, especially during emergency situations. It is all about how conscientious, considerate and determined are both teachers and learners in maintaining all the aspects of decorum required, in line with ethics of teaching and learning, so as to achieve the desired objectives thereof. It is also about the willingness of the government and network providers to ensure adequate availability of internet and other related services.

Ordinarily, students learn classroom ethics in school, such as being punctual, avoiding noise making, not hurting fellow students, and many more. However, the advancement of technology has brought with it some sort ethical dilemma, a situation where it is difficult for one to make an appropriate choice due the presence of competing goods and competing evils. The dilemma is not in the technology itself, but in its use. In this digital age, kids usually begin to make use of technological devices even before they start going to school. In such a situation, parents often guide and supervise them. Some parents do not even allow their children to connect to the internet without a reasonable adult being around.

From their various homes children come to school already exposed to technological devices, with their differing experiences and levels of skills. Teachers have to contend with this situation in the light of ethics of technology use, so as to guide the students properly, especially with regard to ICT. Issues such as safe and appropriate sites for learning, observing copyright laws, self-image presentation, cyberbullying, proper use of online citations, and care of technology devices, are some of the ethical issues that come into play in the use of ICT in learning, especially in emergency situations.

Although ethical issues are themselves problematic in the context of ICT, they can play positive roles in curbing the challenges encountered in the process of teaching and learning making use of ICT. It is therefore important that these ethical considerations be points of attention even without anticipating any emergency situation. It is expected that both teachers and students be familiar with them, for it is on the bases of these that their ethical actions are evaluated as they make use of ICT in teaching and learning. Without such familiarity, both teachers and learners would be in ethical dilemma when it comes to the use of ICT in teaching and learning in emergency situations. With good understanding and application of ethical issues in the use of ICT in teaching and learning in emergency situations, it is hoped that the challenges therein can be gradually overcome, and the relevance of ICT in teaching and learning in such situations be all the more appreciated.

Conclusion:-

Teaching and learning, as the hallmark of educational practices, deserves continuity even in emergency situations such as outbreak of diseases, natural disaster and so on. Online teaching and learning becomes imperative through information and communication technology (ICT) to bridge the gap which these emergencies create. Information and communication technology is analyzed in providing online teaching and learning in emergency situations. Relevance of ICT to teaching and learning in emergency situations is established. Challenges confronting the use of ICT in providing online teaching and learning in emergency situations are exposed. Financially challenged learners are often deprived of online teaching and learning in emergency situations. This vitiates their fundamental human right to good education. Based on the above observations and analysis, it is the conclusion of this paper that the relevance ICT inn teaching and learning in emergency situations is never in doubt, but it is faced with lots of challenges. However, these challenges can be overcome through proper understanding and application of ethical principles associated with ICT, by both teachers and students, as well as government and network providers ensuring adequate availability of internet services, and other enabling environments.

Recommendations:-

In the light of the conclusion drawn, the following recommendations are put forth:

1. It is good that teachers at all levels of education be well knowledgeable in the use of ICT in teaching and learning, with its ethical concerns, so as to be able to guide students properly.
2. Students should endeavor to be discreet in their use of the internet, the sites they visit and the things they post online.
3. Government should assist financially challenged learners to have access to technology facilities to enable them participate in the online teaching and learning in emergency situations.
4. Government should legislate and provide enabling environment that will make online teaching and learning thrive in emergency situations.
5. Government and school authorities should come up with clear strategies to ensure that both teachers and learners are equipped with necessary skills, knowledge and competencies to engage in online teaching and learning in emergency situations.
6. Government other relevant agencies should make adequate provisions for on-line teaching and learning, especially for the use of ICT in emergency situations.
7. Government should ensure adequate power supply, thereby enhancing the use of ICT in teaching and learning in emergency situations.

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32. On Fri, Apr 8, 2022, 3:44 PM Aloysius Ezeanolue<aloysiusezeanolue@gmail.com> wrote:
33. Submission of Creative Output.docx.