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Implications of Critical Thinking, Creativity and Information Technology on Education

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Abstract. One can say that it is expedient in this present world that individual should strive towards the acquisition of at least basic knowledge of science and technology for proper development, most especially in the area of Education (teaching and learning). This is necessary to assess reasons properly as well as to possess tendency to ask probing questions and bind these with critical thought to serve as the basis of creative thinking. This is because in today's highly technological society, the critical demand for inventive scientists and technologists has highlighted the need for some means of identifying those individuals with the greatest creative promises. In education where creative qualities appear to have formerly neglected in both teaching and testing, it is desirable to assess each individual's creative potential through critical thinking. The assessment is important to pave way for the creative thinking that will lead to problem solving activity. It is on this note that the paper focuses on the Implications of Critical thinking and Creativity on Information Technology in Education.

Keywords: Education, Creativity, Critical thinking and Information Technology

1. Introduction

Education, critical thinking and creativity could be seen as concepts aiming at the same direction. This can be justified by looking at the meaning of these concepts one after the other. Education according to singh (2007) is derived from the Latin words: "Educere and Educare". Educere stands for to lead out, to draw out among others. Educare on the other hand connotes to bring up, to raise and to educate. Going by the concept of critical thinking, one can say that only the critical mind can be said to be critical in thinking and creative. Critical thinking is the intellectually disciplined process of actively and skillfully conceptualizing, applying, analyzing, synthesizing and or evaluating information gathered from or generated by observation, experience, reflection, reasoning, or communication as a guide to belief and action. Creativity just as education is vital to national economic and technological substantiality. The needs for creativity during the learning process cannot be denied Yorke and knight, (2006) MC William and Haukka (2008) argued that creativity is very valuable economically to communities and organizations. For internationally competitive workforce, the students will not only need to have the skills and knowledge but they also need to have a high sense creativity in order to be able to solve the increasingly complex problems in their jobs (Lee, 2002). Considering all these, the paper focuses on the Implications of Critical

thinking and Creativity on Information Technology in Education.

Education is conceived as a process which must involve the transmission of something worthwhile. This stands for the purpose and intentions of education. On the other hand, any process which does not involve the transmission of values, knowledge, understanding as well as the active mental and voluntary participation of the recipients does not merit the title education. Farrant (1964) made similar remarks in the following words. On the social plane, there is no value in producing a child who is good at his school work and who is at the same time rebellious toward the community. Infact, the aim of education should be geared towards producing those individuals who are completely integrated into the community. The social misfits and all those educated individuals who cause crisis in the society show the reflection of improper usage of knowledge and these are the results of inability to attain the goals of education. In line with Ayeni (2003), describes education as man's centred activity which bears upon knowledge and development. According to him, knowledge in this sense is based on experience since it goes along with development. In the field of education in Nigeria people are often faced with greater challenges in this era of technological developments, it is now the task of education to help in the propagation of knowledge, skill and attitude that will enable our people to meet the challenges of time. The knowledge acquired through education should help people to understand and appreciate the immediate world, and at the same time be useful for them to catch the glimpse of the world that is coming. In society today, nearly all areas of human activities are undergoing tremendous changes, consequently new ways of doing things and new knowledge may open new vistas to create new life. Likewise, the emergence of new method of committing crimes that cause insecurity calls for emergence of new knowledge that would be based on positive thinking

2. Critical Thinking

Critical thinking is the ability to think clearly and rationally about what to do or what to believe. It includes ability to engage in reflective and independent thinking. Critical thinking promotes creativity in individual. To come up with a creative solution for a problem involves not just having new ideas, it must also be the case that the new ideas being generated are useful and relevant to the task at hand. Critical thinking plays a critical role in evaluating new ideas, selecting the best ones and modifying them if necessary (Joe & Jonathan, 2016)

As the global knowledge economy is driven by information and technology, one has to be able to deal with changes quickly and effectively. The new economy places increasing demands on flexible intellectual skills, and the ability to analyse information and integrate diverse sources of knowledge in solving problems. Critical thinking provides the tools for this process of self – evaluation. The ability to think clearly and rationally is important in whatever we choose to do. If one works in education, research, finance, management or the legal profession, then critical thinking is obviously important. Being able to think well and solve problems systematically is an asset for any career. (Joe and Jonathan, 2016) This may also be in line with the position of Anderson (2007) that Human beings reason well when they take the time to do so. Critical thinking is constituted by particular skills such as the ability to assess reasons properly, or weigh relevant

evidence, or to identify fallacious argument in a critical attitude or disposition such as the tendency to ask probing questions.

Critical thinking is also an important goal of Education within the school sector. It is embedded in the Meibourne Declaration (Educational Goals for young Australians) which
discussed successful learners as those who are able to denote deeply, logically and evaluate evidence in a disciplined way as the result of studying fundamental discipline and elsewhere those who are able to make sense of the world and think about how things have become the way they are (Margaret & Nan, 2010).

Ennis (1996) defends a conception of critical technology based primarily in particular skills such as observing, inferring, generalizing, reasoning, evaluating reasoning. For him, critical technology is the correct assessing of statements, but he has also defined it more generally as reasonable reflective technology. Ennis maintained that the skills associated with critical thinking can be learned independently of specific disciplines, and can be transferred from one domain to another. He does, however, acknowledge that a certain minimum competence in a particular discipline is essential before one can apply the skills of critical thought to that domain, for him the process of critical thinking is deductive. It involve applying the principles and skills of critical thought to a particular discipline. A critical thinker is able to understand the bigger picture holistically, to see different worldviews in perspective rather than just to criticize the individual steps in particular argument. For Ennis, dialogue with others who are different, who have different worldviews and cultural back grounds is essential feature of critical thinking.

3. Creativity

Creativity is an ability or power to create or bring into existence, to invest with a new form, to produce through imaginative skill, to make or bring into existence something new. Creativity has been seen as an important component of education not only by Nigerians but also by many people across the different nations of the world. For instance, O' Donnell and Micklethwaite (1999) received the curriculum documents of sixteen developed countries and discovered that creativity was included at various educational levels of most of these countries. In Korea for example, it was discovered that the National curriculum defines an educated person as somebody who is healthy, independent, creative and moral.

Creativity is one of the valued and prominent acts that spring from the mind. It is a creative feature which distinguished human beings from animals and machine. This is in agreement with the words of Rene Descant as (1985) who states that creativity is a phenomenon that falls outside the scope of mechanistic framework. For Descants, Creativity is firstly a process of the mind. The process is evidenced in a form which is different from products already existing. It is the generation of imaginative new ideas, involving a radical newness, innovation or solution to a problem and radical reformation of problems (Newell, and shall, 1972). This means that creativity is the generation of something new in an environment. This should include novelty, appropriateness and values as postulated by sethy (2009) Novelty means newness, originality, uniqueness, unusualness and unconventionality. It is unconventional, when it requires modification or rejection of previously accepted ideas.

Looking at the creativity from the utilitarian perspective, it refers to a service or product that has functional, consumption and beneficial value. Creativity is synonymous to innovation. Innovation has been defined as "the intentional introduction and application (within a job work team or organization) of ideas, process, products or procedures that are new to that job, work team or organizations that are designed to benefit that job, work – team or organization (West & Richards, 1999). Innovation can be understood as introducing something new into an existing domain, sequence or process. Innovation relates to creativity to the aspect of creating those to solve problem or creating things that have utility of some sort. In other words, for any act or product to qualify as being called innovative, it must involve some discernable change or must challenge the status quo.

Just as it is in critical thinking, languages are also tools for the expression of creativity. Without language, there is no way the creator will be able to bring to people's awareness what he has created in his mind. Creativity is reflected not only in the mere expression of new ideas but also in the creator's ability to manipulate words and language in such a way to make listeners (students) appreciate his speech. (teaching). As a matter of fact, every creative art could be said to be a language on its own since it is intended to and thus communicate a massage. Take for example, when a fashion designer designs a material, he hangs it outside his shop to communicate to the public his capacity to produce good dresses. The dress by its design is a language that speaks of the beauty and comfort it could enhance the person who wears it.

Fasuyi and Adeleye (2013) said creativity is a mental process involving the discovery of new ideas or concepts or new associations of the existing ideas or concepts, fueled by the process of either conscious or unconscious insight. Some people attributed creativity to be divine intervention, cognitive processes, personality traits, and chance. It has also been associated with genus. Akinpelu (1981) believe creativity to be forehead brain activity or even specifically with lateral thinking.

One at this juncture can say that it is possible to train people to carry out tasks in better ways, acquire new techniques and skills and to accumulate new knowledge. The whole essence of creativity lies in its freshness, its freedom, its newness, creativity is often unexpected and breaking rules. It may result in something radically different or it may involve the unfolding of an old and established form with a total freshness. Creativity is the essence of life, of evolution of consciousness, of nature, and of matter. The universe itself is in a constant act of creation so, as its children, we should ask ourselves why, in such a creative universe, do societies and some individuals at times appear to be stupid, dull, destructive and uncreative? Are people really dull or is their creativity simply being shown in other ways without the people awareness. Are we all, in fact, creative or is it just that there are certain blocks which seem to frustrate us in certain areas of our lives? Do we all have the potential for critical thinking or creativity no matter how old we are? These questions will lead us to the question of critical thinking, creativity and their implication on information communication technology in education.

4. Historical Perceptive of Information Communication Technology.

Information is defined as fact or knowledge which is proved or learned while

information technology is the study or use of systems such as computers and telecommunication gadgets for storing, retrieving and sending information (Longman Dictionary of contemporary English, 2001). Information, according according to Talabi (2000), is the body of knowledge which is meant to further broaden the horizon of the individual to which it is exposed while according to him information technology is the means of facilitating the transmission of information as well as its management.

Going back to primitive age of the early man, critical thinking and creativity manifested in their activities as he struggled for survival. According to Ali (1988) the pre – historic man felt little need for any form of communication, although it is believed that knotted cords and notched sticks were used to retain knowledge and transfer information. He also probably scrawled crude drawings (pictography) on stones, weapons, utensils and walls of caves, although such drawings were of physical objects which were created as a result of his critical thinking. For early history, man learnt to give information by means of visual imagery. At a particular point in history, man needed a set of symbols that singly and in groups, could visually represent both real objects and mental concepts. He invented a workable alphabet later. With time he invented ink and other writing materials to put the letter together. A further development in man's information communication technology came with the advent of the printing machine which as invented by a German called Johanna Guttenberg in about 1445 A.D. The German improved on the Chinese hard-out wooden blocks which were developed in china in about 5^{th} century A.D by developing and using movable metal blocks at Mainz in Germany. Consequently, the age of book was born in 1456 A.D when he produced the bible. Other books later produced with the new invention that followed (Babalola 2004). All these were made possible as a result of creative thinking of the early man.

5. Critical thinking, Creativity and Information Technology in Education.

Today, due to a binary world of quick change, educators must venture on their own creative thinking in building a lifelong mastery with technology. They must not only develop their ability to survive a very unpredictable digital information age, but also defeat the accompanying challenges.

With the aid of technology, many teachers can take students beyond traditional classroom limits, creating virtual environments to experiment and explore. According to postman (1996), technology should be utilized as an object of inquiry. We should be aware of how we might use technology and also how technology uses us. Some technologies are particularly helpful because their design characteristics challenge higher order thinking and problem solving tasks; students are encouraged to explore and to learn by discovery. However, computer technology need not be used only for navigating linear programmed tutorials (a system designed to teach by providing the learner with information or linear demonstrations of subject matter, i.e CAI). It may also be a system to provide the contact for the learners' discovery in which the student investigates, researches, and explores learning experiences that the student controls upon guidance by the instructors. Used as a general purpose tool, technology can be used to solve many challenging task such as data analysis or program development.

In teaching and learning, computer can be used a means of communication, internet, e-mail, and feedback via networks. When using technology to communicate, a teacher must consider the constraints, in other words, the features that let users operate but limits the user from doing what he/she is able to do, and features to which the user ordinarily attends (Kerr, 1968). Constraints can only provide pre-designed and pre-specified sequenced information and pre-conceived solutions. The student under guidance is the one who make logical, creative associations, construct knowledge and learn from these activities. Therefore, teachers must search for creative ways to surpass technology's limitations in order to challenge a student's mind.

Despite what teachers and learners do with these technologies, these habiliments cannot and will not substitute for the communication exchange of human interaction. Technology, when effectively used however, might expand the magnitude of human dialogue via distance learning, computer – medicated communication, and other means of on – line communication. Our institutions of learning need to judge how and where human interaction can be ERmost effectively and creatively employed (Noble, 1998). Moreover, it is essential for learners to learn how to access needed information, sort and categorize it, and make necessary associations and inferences from the events surrounding those activities.

The information explosion dictates the need for faster and better thinking to scan, digest, assess and act upon a bewildering bombardment of fact. Every day something new can be learned, thus, something new could be taught (Alexander a knight, 1993). According to Woronow (1994), computers themselves do not automatically change the nature of teaching and learning. Seemingly, the ways a teacher integrates computer learning with classroom construction through energy and creativity appears to be the catalysts that create fertile, thriving learning environment.

6. Conclusion

In the paper, we have discussed the significance of critical thinking, creativity and information and communication technology on effective teaching and learning process in our educational system. The paper submitted that it is most expedient for both the teachers and learners to be critical in their thinking, creatively oriented and technologically based to improve their teaching skills. The paper further maintained that critical thinking and creativity can be developed in individual to aid teaching and learning in schools just as information and communication technology could be panacea for effective teaching and learning.

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