Teaching and learning in a smart classroom for the 21st century schools in Nigeria: The connectivist approach

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Abstract
This study spotlights literature review and analysis for connectivism and examines how connectivism theory has reshaped the traditional classroom to a smart classroom. The method attempts to identify the teachers role, importance and effects of incorporating connectivism in a smart classroom for21st century learning. It further identifies some constraints that militate against connectivism in smart classroom in Nigeria and finally recommendations were also offered.

Keywords: traditional classroom, teaching and learning, smart classroom, the connectivist approach, 21st century schools

Introduction
Connectivism can be aptly be defined as instrument per excellence for World Wide Web. The explosion of schools population in Nigeria (primary, secondary and tertiary institutions) has been greatly affected positively in quality through the use and help of connectivism theory. In this wise, connectivism in a smart classroom cannot be ruled out. In this current era, educators and educationist are more analytic to know how knowledge is disseminated to learners and the society at large. Traditional classrooms and methodologies have been advanced through the use of connectivism and as a result of this most classroom settings, teaching methods and learning process has change to an intertwined style where learners develop a problem solving learning skills, creative minds and information literacy.
Connectivism has brought us to the era where students and teachers can now get multiple knowledge of a concept through the internet on their laptop, cell phones, iPad, tablets and other digital facilities. Sharma, (2017) [8] posited that connectivism made students and teachers more knowledgeable, more interrogative, more competitive and more demanding. Siemens, (2014) [12] also says that connectivism has emphasized on the role of networks in today's society and on the importance of links between ideas, facts and information.

An Overview of Connectivism Theory
Connectivism is a learning theory that was propounded by Dr. George Siemens in the year 2004. It is known for providing internet technologies, creating diverse opportunities for people to learn and share knowledge among themselves and across the World Wide Web. Connectivism utilizes Information and Communication Technologies (ICTs) achieve learning in this digital age.
The following principles was established by connectivism theory:
- Learning and knowledge can be acquired by different point of view.
- Learning can be achieved through the use of different tools.
- Learning involves networking and connectivity.
- The activities of learning should give out accurate and up-to-date knowledge.
- Learners choose what to learn.

With the above principles, connectivism theory in its effect is taking learning and knowledge to the doorstep of everyone in this current era not minding the status and physical barriers. The principle of constructivist learning attempts to provide answer to the 21st Century learning skills. Bullock (2010) listed the 21st century learning skills as the seven C's, which are: critical thinking, creative and innovation skill, collaborative skill, cross-cultural understanding, communication skills, computing skills and career learning. According to Bullock, these skills are not only providing a framework for successful learning in the classroom, but guarantee students can thrive in a world where change is norm, constant and learning never stops. This view was corroborated by Rich (2010) [7] in her advocacy that schools need to teach to help students strive in today's world.

The Traditional Classroom versus the Smart Classroom
The traditional classroom involves the teacher providing a face-to-face instructions to students in a conversational classroom setting. It is also a communication between and among teachers and students in a confined learning space with arrangement of desk placed in rows facing the chalkboard. In the traditional classroom, students just have their pen and paper and the teacher gives a direct instruction. It requires students to listen passively as the teacher teaches and a time set for questions and answers. This pattern of pedagogy is gradually facing out as the smart classroom have taken over the day.
The smart classroom in the other hand requires the mixture and combination of the traditional and modern ways of

providing instructions for students. A smart classroom is the classroom that has a confined space for learning and is technologically intensified. It is teaching and learning environment that is equipped with learning groups, tablets and interactive white boards around. In a typical smart classroom students form themselves in a shared learning space to construct, manipulate, view video programmes, discuss, do presentations on topical issues and engages with various other learning resources while working in groups (Ekpo, 2019) [3].

The smart classroom environment is enveloping as learning takes place all around the confined space. Learners in a smart classroom used these interactive platform to discuss a concept, search for their clarity and get to a collective understanding. This type of environment gives opportunities for knowledge to be provided in a penetrating and deeper way.

The role of a teacher in a connectivism world

In a constructivism environment were content and information is freely available, the role of the teacher needs to change because collaboration, creativity and critical thinking are to be ever more actively, and explicitly encouraged. In student centered learning where students are active agents who are engaged in collaborative projects that are relevant to their real word, they are involved with sustained investigations that generate new ideas by extending upon the ideas of others. However, for this to happen, teachers need to see themselves as a facilitator of learning with the approach of a coach (Wang, 2006) [15]. This role is different from the traditional role of teacher as a reservoir and repository agent of knowledge.

Starkey (2011) [14], acknowledge that one constraint of the mandated curriculum is that it limits the potential for teachers to adopt the role of facilitator. However, a shift in the teachers role to that of a facilitator assists with the development of contemporary skills such as collaboration, critical thinking, problem solving; all skills required for the 21st century learning (Fullan & Smith, 2000) [4]; (BECTA, 2004), (Lyons, 2007).

For this to happen, the teacher "supports the students in their search and supply of relevant materials, coordinates the students' presentations of individual milestones of their projects, moderates discussions, consults in all kinds of problem-solving and seeking for solutions, lectures on topics that are selected in plenary discussions with the students and conforms to the curriculum" (Motschnig & Holzinger, 2002) [6].

Teachers as facilitators in a connectivism world help students in utilizing a range of digital technologies to access information and share that information through various learning platforms. The resultant effects is that students can now connect and collaborate with each other in a seamless manner where they can demonstrate their learning with the use of new 'apps' that they (more than likely) have discovered through their virtual learning network.

Another role for teachers is their willingness to engage with the connectivism of digital technology so as to assist students to create knowledge and understand concepts through their participation of the digitally enhanced learning environment they access each and every day.

In a classroom that is enabled by technology, studio-style instruction becomes infinitely more practical, functional and effective as teachers can use a host of tools to connect students to one another, share projects, encourage debate and peer feedback. Therefore teachers can be redefined in this age of networked learning as "network administrators". As network administrators, they help students to form and evaluate a personal learning network of their own. At this point, classrooms become portals of information as learners are taught to work within the flow of global information that is constantly evolving.

Importance of incorporating connectivism in a smart classroom

First, a smart classroom can be appropriately defined as technology-enhanced learning environment that foster opportunities for teaching and learning by incorporating teaching technology. Such technology includes, but not limited to computers, various specialized software, audience response, assistive learning devices, audio-visual capabilities, and networking. In the sphere of education, the importance of connectivism cannot be ruled out and is now majorly used to disseminate knowledge. However, the importance of cooperating connetivism in a smart classroom can be perceived differently and in the following ways:

- Connectivism provides insight into learning skills and tasks that are needed for learners to flourish in a digital era (Siemens, 2005) [10]
- Connectivism will provide opportunities for students to make choices about their learning. For instant, learners were not forced to learn contents considered not needed.
- Connectivism will promotes group collaboration and discussion, allowing for different viewpoints and perspectives to aid in problem-solving, decision-making, and making sense of information.
- In a connectivist world, learning can never stop. There will always be something new to grasp and make sense of. By so doing, learning becomes a life-long encounter.
- Connectivism utilizes the internet and social networking to expand classroom discussions beyond the classroom boundary or confinem, school, local community or even nations in order to consider and account for the wider variety of human experience and expertise that is available and can contribute to understanding the way the world works.
- The ability to critically examine and make intelligent decisions as new data is revealed is yet another hallmark of Connectivism.

Effects of connectivism in a smart classroom

Education is undoubtedly shifting "from formal, rigid confined geographical learning space into an environment of informal, connection-based, network-creating learning. The effect of this is that the instructor or institution has to ensure that critical learning elements are achieved...while the links and connections are formed by the learners themselves" (Marhan, 2007) [5]. The effects of connectivism in a smart classroom are catalogued as follows:

1. The implication of connectivism in a smart classroom will

be a dynamic relationship between the teacher, student and resources. While the teacher is a resource for support and academic advice, the students would be given complete independence to connect with their peers and other like-minded people in order to gain the most accurate information, not only on the subject matter but also the writing process.

2. Connectivism also facilitates the life of the teacher as assignments can be handed in online and staff collaboration is easier to manage and,

3. Rather than treating learning as a process of acquisition and creation of concepts it treats learning as a process of growth and development of networks. A teacher blends his educator expertise with learner construction. The learner is at the center of the learning experience and he or she determines their own content of the learning and develops ability to find relevant information.

Constraints imitating against the use of connectivism in smart classroom in Nigeria

Having recognized and agreed that for the 21st century, connectivism theory application in teaching and learning is very relevant, there are various limitations that militate against the use of connectivism theory in smart classroom in Nigeria. Some of these constraints are;

▪ Epileptical power supply: This is a major challenge that might interrupt teaching and learning in a smart classroom.

▪ High cost implication as In incorporating connectivism learning in schools would attract huge financial outlay on school proprietors and proprietresses as every classroom needs to be equipped with smart gadgets.

▪ Poor state of communication network as many schools are located in rural areas where there is no communication network or the network could be frustrating (Wordu, 2020).

▪ Schools would be unable to admit or accommodate large number of students into a particular class. Most schools have insufficient classroom to accommodate large number of smart gadgets for students' usage.

▪ Lack of competent teachers to manage this creative knowledge to students.

▪ The cost implication for recharging internet data or satellite television for learning daily, weekly and monthly.

Recommendation

Based on the study, the following recommendations were offered:

▪ Availability of stable power supply especially for schools in rural areas.

▪ The government should ensure there is enough smart gadgets in our schools (private and public). Any school who defaults, drastic measures should be taken against such school.

▪ There should be a guiding policy for the implementation of connectivism in teaching and learning for the 21st century.

▪ The connectivism approach of teaching and learning should be made compulsory to all form of education and all educationists.

▪ Teachers should be trained on the use of smart gadgets and software to make competent for the job before been employed.

▪ There should be proper and stable network connection services both in urban and rural areas.

▪ Teacher remuneration should be visited knowing that it is more tedious to teach in a smart classroom compare to teaching in a traditional classroom.

Conclusion

It is pertinent to note that connectivism learning approach in a smart classroom will remain a fancy ideas if it is effectively implemented in smart classroom. The connectivism approach of teaching and learning is however of no doubt a novel development which holds great promise for our education system and the betterment of life for a larger Nigerian society.

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