IJNRD.ORG ISSN : 2456-4184
INTERNATIONAL JOURNAL OF NOVEL RESEARCH AND DEVELOPMENT (IJNRD) | IJNRD.ORG
An International Open Access, Peer-reviewed, Refereed Journal

Pedagogical approaches in online teaching and students learning outcome. The case of Higher Institutions in Cameroon.

By

Mbing Glean Tawe

The ICT University, Cameron Campus-Yaounde)

&

Dr. Njodzeven Brendan Tar

(ENSET-University of Ebolowa)

Abstract

Online teaching is to be the most operational tool of modern technology of influencing students' learning outcome so that they strive willingly and enthusiastically towards the accomplishment of goals. Cameroon with the dream of being an emergent nation by 2035, has not only thought of a way of making higher education more efficient and effective, but increasing learning outcome of students to make them more effective and efficient in delivering their acquired skills like the distribution of laptops. But this has not been the case as learning outcome is very poor. The key to create a good strategy in attending emergence by 2035 is an answer to the question, what really enhance learning outcome? The main objective of this study is to investigate the influence of pedagogical approaches in online teaching on learning outcome among Higher institutions of learning in Cameroon.

To accomplish this purpose, the study employed a descriptive survey and correlational design. The study was carried in the ICT University. A total of 350 students participated in the study. Among them187 students were included as a sample through simple random sampling technique. The instruments for the study were a five-point likert type questionnaire and an observation guide. The analysis of the quantitative data was carried out by using frequency, percentages, mean, standard deviation and Pearson correlation. The findings indicated that there is a significant positive relationship between pedagogical approach in online teaching and learning outcome.

Keywords: Pedagogical approaches, online teaching and learning outcome.

Introduction

Cameroon as a third world country with the hope of becoming an emergent nation by 2035 depends solely on the modernization of education. The modernization of education here is aimed at improving the educational productivity which in return will help in the modernization of all the sectors of our society. Educational systems are under increasing pressure to reduce costs while maintaining or improving learning outcomes of students. To improve educational productivity, many higher institutions are turning to online learning. Due to the tremendous popularity of the internet, online learning is the newest and most popular form of distance education today. One of the objectives of the Ministry of Higher Education in Cameroon according to MINESUP, 2009 in Bilola (2015) is promoting access to new information and communication technologies (ICT) especially with higher education being the engine of developing ICTs. To achieve this aim, Higher institutions have been compelled to offer free wireless internet to students on campus for research with the support of the Presidential donation of free laptops to registered higher education students of 2017/2018 academic year.

This has help to boast access to the internet such as online education. Higher institutions like the Information and Communication Technology University U.S.A, Cameroon campus has embraced online education, yet a majority of higher institutions are still skeptical about the quality of online learning (Allen & Seaman, 2012). Such skepticism may be well founded, given that higher education students tend to perform more poorly in online courses as compared with face-to-face courses (Jaggars, 2013; Xu & Jaggars, 2011a; Xu & Jaggars, 2013). The Internet has made online learning possible, and many researchers and educators are interested in online learning to enhance and improve student learning outcomes while combating the reduction in resources, particularly in higher education (Farinella, Hobbs, & Weeks, 2000; Kim & Bonk, 2006; Pape, 2010). The investment in communications technology in society generally, and higher education in particular, has created the potential for an unprecedented range of teaching and learning possibilities. Many of these technological investments have been used to support online learning (Allen & Seaman, 2007).

Online teaching, defined as a platform for delivering educational content and facilitating instructor-student interaction over a computer network (Shelton & Saltsman, 2005), came of age in the 1990s and grew rapidly over the next decade (Allen & Seaman, 2010; U.S. Department of Education, 2003; U.S. General Accounting Office, 2002). According to the National Institute for Learning Outcomes Assessment (2011), during roughly the same period, increasing calls for accountability in higher education led to the development of measures to establish the value of higher education in general, through the mechanism known as “learning outcomes assessment” (LOA). Besides historical proximity, these movements—online education and LOA—shared important features: both represented the introduction of disruptive concepts into the traditional face-to-face, faculty-centric classroom, and both raised questions about the efficacy of traditional models of teaching and learning measurement that had remained essentially unchanged for centuries.

With the help of the internet, online teaching has become the newest development of ICTs in education. The Internet has made online learning possible, and many researchers and educators are interested in online learning to enhance and improve student learning outcomes while combating the reduction in resources, particularly in

higher education (Farinella, Hobbs, & Weeks, 2000; Kim & Bonk, 2006; Pape, 2010). The investment in communications technology in society generally, and higher education in particular, has created the potential for an unprecedented range of teaching and learning possibilities. Many of these technological investments have been used to support online learning (Allen & Seaman, 2007).

Statement of the Problem

Learning outcomes focus on specific knowledge, skills, attitudes, and beliefs that you expect your students to learn, develop, or master (Suskie, 2004). One of the major challenges of teaching online is that everything has to be more explicit than in a face-to-face course because the usual channels (your tone of voice, repeated vocal reminders, informal conversations before and after class) are absent. Online learning outcomes express your expectations to your students. There are hopefully clear messages that help students know what you expect from them and what they should spend their time practicing and studying. From mere observation in some higher institutions in Cameroon that practices online teaching like the ICT University, the learning outcomes of online teaching such as broadening access to resources, engaging students in active learning, individualizing and differentiating instruction, personalizing learning, Opportunities for practice, maximizing teacher and student time are very minimal among their students in particular and higher institutions in Cameroon in general. Thus it can be said that poor online teaching approaches accounts for poor learning outcome in online students. With this, the main problem of this study was poor and low learning outcome among the students which results from the effects of many pedagogical online teaching factors such as constructive, interactive and active approaches in some higher institutions of learning in Cameroon. To better the process of online teaching, there must be staff development. According to Njodzeven (2014), staff development refers to all the educational and personal experiences that contribute to enabling an individual to become more competent in an assigned role. In the field of education, its ultimate aim is to ensure better learning for all categories of learners, self renewal of educators and the improved productivity of schools. Online learning offer higher technological skills through its interaction with the world at large, in return students are expected to demonstrate higher learning outcome upon completing training in a professional domain, but this has been a failure in some higher institutions of learning in Cameroon making it a problem. This problem if not solved will lead to wastage of resources on the part of the institutions, wasted time and money on part of the learners, low standards of teaching and learning and poor output on the part of teachers and fall in the standards of education on the part of the state. Poor online learning in the ICT University has been justified in the justification of the study.

Online teaching is most effective when delivered by teachers experienced in their subject matter and the best way to maintain the connection online education and learning outcome is through blended learning and fully online instruction (Graham, Allen and Ure, 2005). Online learning advocates argue that reasons for embracing this medium of instruction include current technology's support of a degree of interactivity, social networking, collaboration and reflection that can enhance learning relative to normal classroom conditions (Rudestam and Scheonhdtz-Read,2010). Purely online instruction may be an attractive alternative for cost reasons if it is equivalent to traditional face-to-face instruction in terms of student learning outcome. Blended learning on the other hand is expected to be an enhancement of face-to-face instruction. Many would consider blended learning

applications that produce learning outcomes that are merely equivalent to those resulting from face-to-face instruction without the enhancement or a waste of time and money because the addition does not improve student outcome. Different online pedagogical approaches promote different learning experiences by varying the source of the learning content and the nature of the learner's activity (Galvis, McIntyre and His 2006). It is based on this backdrop from mere observation and experience that prompted the researcher to carry out this study on an analysis of the influence of pedagogical approaches in online teaching on learning outcome in higher institutions in Cameroon.

Research objectives

- To find out how pedagogical approach in online teaching affect learning outcome.

Research question

In addressing the influence of pedagogical approach in online teaching on learning outcome among higher education students in Cameroon, the following research questions were raised

- How does pedagogical approach in online teaching enhance learning outcome?

Hypothesis of the study

There is a significant relationship between the pedagogical approach in online teaching and learning outcome of students in Higher Education.

Literature review

Pedagogical approaches in online teaching and learning outcome

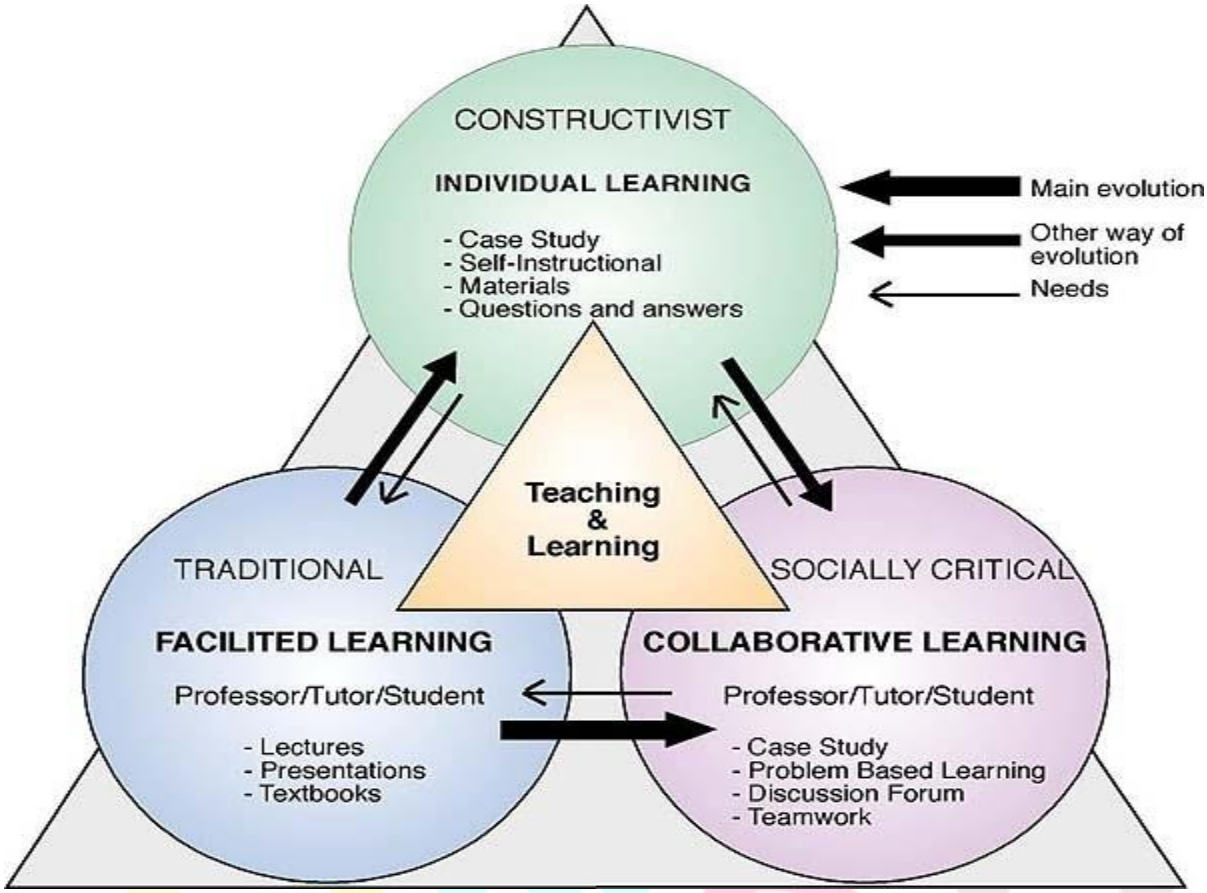
According to Serdykov (2015), the extensive integration of information technologies in teaching and learning in the 21st century has initiated a dramatic change of educational paradigm. To a large extent this change has been caused by the online education. A rapid growth of online university programs raises a number of new pedagogical, psychological and social issues. Online learning creates a learning environment that, compared to traditional, classroom-based education, is less personal, more independent, often fragmented, rarely systemic, distributed in space and time, and dependent on the learner rather than on the teacher.

According to Svenaake(2014), when discussing pedagogical approaches in e-learning, we usually end up in debating instructivist vs constructivist ways of doing things. Here is "information in a nutshell", with no ambition of covering the whole issue. In pedagogy in general and online learning in particular, we talk about stages in learning processes and hierarchies of learning and understanding. Bloom's taxonomy is a classic example of such a hierarchy of knowledge. Bloom's taxonomy of knowledge levels has in turn led to a whole system of questions to test the level each student has managed to attain. Bloom's taxonomy mainly describes content and knowledge.

The British educator Gilly Salmon has made a pyramid depicting the typical online learning process; the five step pyramid. Progress in online learning means that we move in steps from mainly being an information exchange group eventually arriving through stages at learning in a community; sharing, supporting, challenging, critiquing, questioning the information presented in order to construct new knowledge, partly building on existing participant knowledge and experience.

Pedagogy is not an exact science, even though some pedagogues would like to look at it that way. As a consequence, exact definitions are not possible. The categories are more concepts, almost heuristics at times. It is easier to say something general, and then state what is typical for each category.

Figure 1: Three main pedagogical approaches in e-learning.

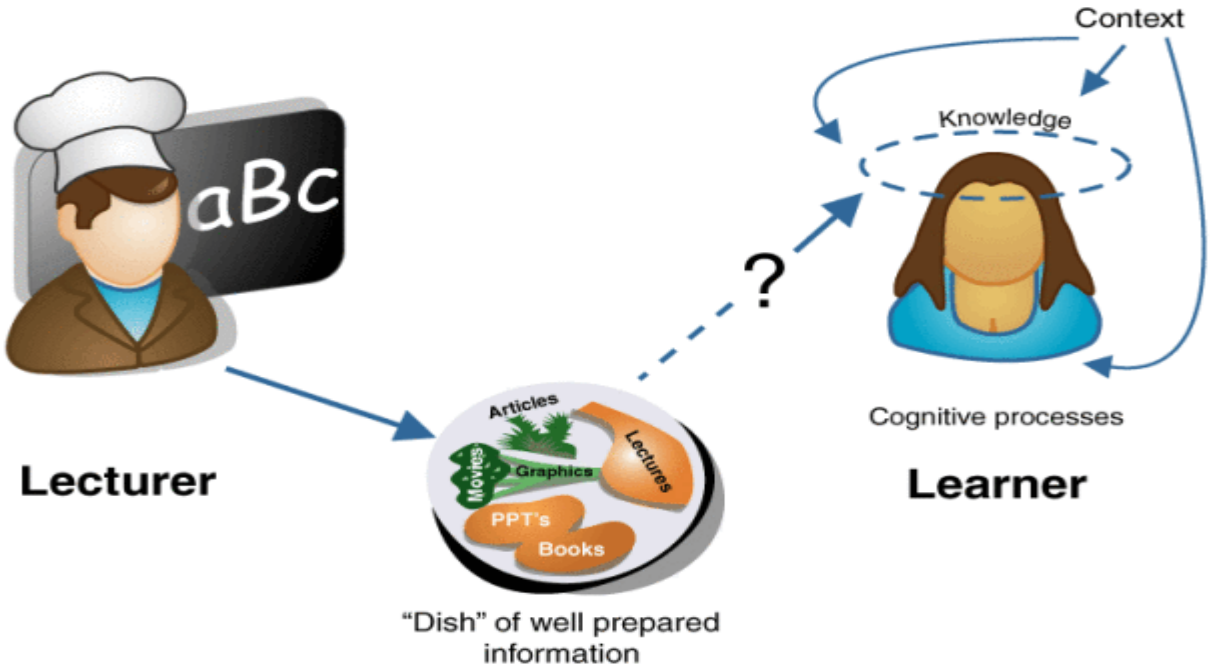


Source: Adapted from Svenaake (2014): Pedagogical approaches in online education

Instructivism or behaviourism in a nutshell and learning outcome

Behavioristic instruction (expository approach) is a traditional way of education delivery. Emphasis is on the transmission of theoretical units of information in a traditional classroom situation: The teacher in front lectures the students facing the teacher. There might be opportunities for dialogue between a student and the teacher. These opportunities are reduced with an increasing number of students present in the classroom. Communication between the students is discouraged as illustrated by figure 3 below.

Figure 2: Communication between the teacher and the students in the traditional approach



Source: Adapted from Svenaake (2014): Pedagogical approaches in online education

The instructivist approach:

The teacher prepares and serves the information for the student to 'absorb'. Focus is on what the teacher teaches. Emphasis is on "getting the message across", where the teacher channels "objective truths" from the information source to the students. A good teacher dishes out the information in well structured "chunks", using didactic skills. The main way of communication is one way. When students communicate with the teacher it usually is in response to control questions posed by the teacher. The teacher knows the answer – s/he has the correct answer, a 'facet'. The teacher controls what is delivered, and decides pacing and process. We therefore call this approach teacher-centered. The information taught is often "decontextualized" i.e. the student studies for the sake of studying, or rather for the exam, in a classroom or school setting. This as opposed to 'contextualized' learning where the student has to learn something in order to solve a problem or assignment connected to real life, maybe even outside of the school situation (Svenaake 2014). As concerns this approach in online teaching in higher institutions in Cameroon, it is mostly used by purely face to face teaching.

The students are able to repeat what the teacher has said and / or what is written in the text book gets to good grades. Rote learning is often used. Own opinions are as a rule discouraged.

Weaknesses:

Many students focus on strategic, shallow learning, just learning the stuff necessary to get good grades on the tests. Critical, independent thinking and acting are often weak points. You risk getting people who without objections accept instructions, or what is written. You also get people who depend on instructions from

somebody "who knows" to lead, motivate and correct. Some students also find that what they learn applies only to the school situation and is not very useful in a work situation in the context of the ordinary society. Many students tend to focus on performance rather than learning. They think that their performance at a test is due to their ability, not effort. ("I can never learn mathematics", rather than: "If I put in more effort, I will learn mathematics"). It has been argued that behaviorism is pedagogy for the industrial society depicted in the Chaplin movie "Modern Times". In the Information age, by some called the rather unclear "postmodern age", it is necessary to add the constructivist dimension to education.

Strengths:

The teacher controls what is "served". The correct information is given. Time is not wasted on understanding why it is correct. Basic knowledge such as learn how to read, write, do simple calculations, grammar etc. can be efficiently taught by cramming, drilling, repetitions and tests. Pupils are e.g. told about Archimedes' law and Pythagoras rule. They don't have to think this out by themselves. They also do not have to learn the difference between poisonous and edible mushrooms by trial and error. Discipline and correct individual behaviour in the learning situation are important values. It is fairly easy to control curriculum and content. The students' ability to cram and reproduce to an exam can be externally verified, e.g. by standardised multiple choice tests and quizzes. Authorities can check whether the teacher has covered the curriculum or not.

The pedagogical challenge:

Do my students really learn, i.e. understand what I teach them? Do they just learn things by heart, forgetting them the day after the test? Do they use words they think I like to hear, even if they don't understand them? What if I ask the test questions in half a year, will they be able to answer then? Is the knowledge they gain of any use in real life outside the classroom? Retention – the ability to remember knowledge – as a rule increases with the time used to work with the information, number of senses and emotions used, testing out one's own understanding and negotiate meaning in interaction with others, and level of understanding gained (Svenaake 2014).

What is more efficient:

a) Learning by heart, drilling, study a text for the sake of studying, testing etc or

b) Active problem-solving, activities building up insight and understanding, critical reflexion?

The answer is probably: It depends. If you want your students to learn irregular French verbs, some types of theoretical mathematics and the latin names of plants and animals, you might consider the instructivist method. If you rather want to develop information literacy – the ability to assess various types of information critically, develop skills that can be used in 'real life'; independence, integrity, social awareness and interpersonal skills, communicate, solve unknown problems, use heuristics, take initiative, decision-making, responsible behaviours and ability to administrate own work etc; other methods might be more efficient (Svenaake 2014).

Constructivism (active approach) and learning outcome

The constructivist approach argues that people have to be active learners and construct knowledge themselves based on what they already know. The knowledge is seen as more subjective, dynamic and expanding rather than objective and static. The main tasks here are processing and understanding of information, making sense of the surrounding world. The learner has a clear responsibility for his / her own learning. This approach is therefore "Learner centred". This approach can be summed up as "I made sense of…". Constructivism demands participation at all levels and moves responsibility and empowerment down the hierarchy, thereby flattening it. The teacher, the "instructivist "Sage on the Stage", will increasingly become a "Guide on the Side" in this setting. The approach is often Problem-Based Learning (PBL). The student is given a task or a problem to solve. E.g. "Make a vehicle for transportation of two persons that can go on land as well as water!". This approach is mostly used by both purely and blended learners with the help of their teacher.

a) The student must decide the process him/herself how to solve the problem or task. S/he must find the resources and tools and decide how to use these resources. The individual student may choose to learn in isolation or obtain interaction and feedback from peers. Mainstream constructivists such as Piaget, claim that learners learn best in interaction with peers (as opposed to interaction with teachers or other authorities).

b) The student may get some guidance with suggestions on how to solve the problem or task, and may be given some resources.

c) The student gets access to a mentor or tutor to ask when stuck. The tutor gives guidance but not the answer. Various resources are provided.

d) Assessment of product as well as process.

Strengths:

The student develops independence and creativity; s/he learns to be critical when choosing his/her resources. The problems or tasks are authentic, and the student as a rule sees that what s/he learns can be applied in the real world. The learning is contextualized: the entire society around can be used when learning, the student is not secluded in a closed classroom with an artificial setting. Constructivism encourages learning rather than performance.

Weaknesses:

It is time-consuming to find out by trial and error, going to the library, asking various people etc. There is a real danger of developing completely individual systems which in some cases may be useful and creative, but often are idiosyncratic; i.e. too individual to be communicated to others. Focus is on the individual or the individual learning in interaction with others. The student may risk becoming a "nerd". Weaker students who are used to a lot of support will have problems. Undisciplined students may simply give up and do other things they find

more amusing without the guiding hand of an authoritative teacher. This way of study may be best suited for elites of the resourceful and independent (Svenaake 2014). External control of what has actually been covered is difficult, and standardised multiple choice testing is often less relevant.

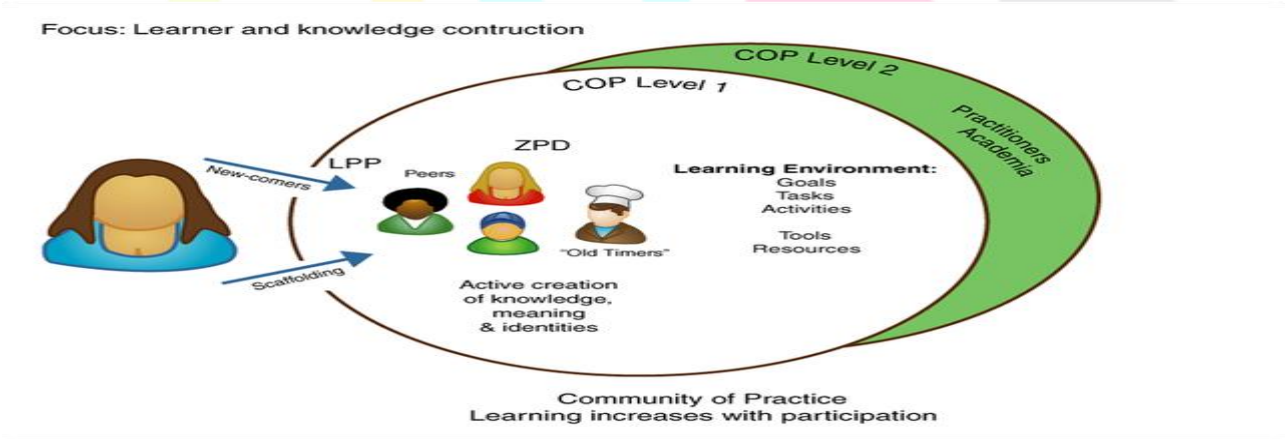
Pedagogical challenge:

Make the student find the 'correct' information and use it properly by e.g. questioning reliability and relevance. It might also be difficult to decide when to guide and when to let the students get on with it. Making the less resourceful and dependent work well in this type of environment without disturbing the others, might be problematic. It takes some experience to find the correct balance between giving no resources at all and define, prepare and deliver all learning resources for the students (Svenaake 2014). Some of the pedagogical challenges faced with this approach in the ICT university; by teachers includes poor familiarity with online teaching, lack of sufficient resources, poor network and by students, lack of familiarity with the learning platform, being present in class but absent in participation, poor network and lack of good learning tools.

Social constructivism or socio-cultural pedagogy (interactive approach) and learning outcome

A community of practice requires activity and questioning. Social constructivism means that the students join a knowledge-generating community; community of practice (CoP), and in collaboration with others solves real problems and assignments in an authentic context as part of their study. In a social constructivist environment, the teachers will, though an "old-timer" (a master), to some extent be a learner together with his/her students, as the generic skills of collaboration, problem-solving and creating new knowledge are important goals by themselves. In the ICT University, interactive learning is promoted through What Sapp groups, Facebook groups, emails and group discussions on the Moodle platform.

Figure 3: interactive learning in online teaching



Source: Adapted from Svenaake (2014): Pedagogical approaches in online education

In a community of practice the newcomer is regarded as a "legitimate peripheral participant"(LPP), "scaffolded" or guided and supported into the community, meets participants, take part in goal-directed activities and learn in "zones of proximal development (ZPD)". According to Svenaake (2014), Learning takes place in "zones of proximal development" (ZPD) where newcomers or novices meet and interact with more

advanced peers; the More Knowledgeable Other (MKO) and old-timers or masters. Newcomers become members of a community by participating in simple tasks that are nonetheless productive and further the goals of the community. The MKOs will meet the newcomer at various stages and make "scaffolds" facilitating the newcomer to approach the Centre of the community. Learning is defined as increased participation.

Through peripheral activities; legitimate peripheral participation, novices become acquainted with the tasks, vocabulary, and organizing principles of the community. The more experienced may give advice and corrections, but as a rule there are few "correct answers" or "facets" in a learning community of inquiry. Everything is up for questioning.

Through this, social interaction learning takes place and competence increases through socio-cultural development according to the Russian psychologist Vygotsky. The tasks will be processing and assessing knowledge, negotiate meaning and generating and co-constructing new knowledge. Learning is a social activity where the students have to use the information they gather actively by applying it in discussion with others. It is not enough to just state opinions; the students must support their statements by referring to reliable and verifiable sources. The demands to academic rigor are about the same as for instructivist courses. Studying for the sake of studying is avoided. Studies should be undertaken for a purpose, and the participants should critically assess information according to relevance and usefulness in solving the task at hand. Often,the educational institution requires that their students develop core values or characteristics like: courage, compassion, curiosity, respect, responsibility and integrity and work systematically to install such values in the daily studies (Svenaake, 2014)

Strengths:

The strengths are similar to those of constructivism. In addition: the participants learn synergistic collaboration and socializing. Socio-cultural learning requires collaboration. The students are not competitors, group work and a grade in common for the group. The constructivist approach emphasizes the individual learner cooperating with others in order to learn. In socio-constructivism, focus is more on the group and group learning than on the individual. It is much easier to keep up the study motivation together with others. The student uses the information gathered by formulating and stating arguments. The knowledge gained is actively used and modified in confrontation with the opinions of others, and thus understanding and insight increase with the discussions.

Weaknesses:

In a learning situation, the various methods can be used in combination. The challenge is to find the right balance. The tutor can see these approaches as tools. Metaphorically: At times it is appropriate to use a hammer, at other times a saw. The same is the case with pedagogical approaches. The good pedagogue knows when to choose what tool and how long to use it.

Assessing the Effectiveness of Online Instruction

As concerns the ICT University the Moodle platform, teaching online courses for the first time requires a period of adjustment; teachers must be able to assess how well an instructional method is working and adapt accordingly. Teachers teaching classroom-based courses can evaluate instructional success through testing, students' and teachers questions, and visual feedback during lectures. Online instructors can also evaluate various teaching methods through assessments and student communications, but the data-driven nature of online technology offers a less subjective measurement of success. Even though these advantages are offered, lecturers in the ICT University use mostly the teachers centered method in teaching online which is less interactive. Learning management systems can monitor progress and behaviors for each individual student, and then compile them for instructor review. The data, called learning analytics, tells teachers how often students are logging in, how much time they spend on each task, and how well they master the material. Such tracking can be valuable. Learning analytics help instructors quickly identify areas of concern at any point so that they can adjust teaching methods, course materials, or objectives accordingly. Teachers new to online instruction who would benefit from more guidance in this area—or online instruction in general—should not hesitate to find the support they need (Svenaake 2014).

Research Methodology

Research Design

This study employed both the quantitative and qualitative research approaches. For the purpose of this study, in order to investigate online teaching and learning outcome, descriptive survey and correlational design were employed. This is because it enabled the researcher to collect and describe large variety of data related to the online teaching and learning outcome. It also help to minimize the influence of extraneous variables. As argued by Kumer (1999) descriptive research design is used to describe the nature of the existing conditions. Seyoum and Ayalew (1989) also agreed that "descriptive survey design is the more appropriate to gather several kinds of data in a broad size to achieve the objectives of the study". In the same line of argument, correlational design is concerned with establishing relationships between two or more variables in the same population or between the same variables in two populations (Leedy & Ormrod 2010). This is also supported by Creswell's (2012) opinion that in correlational research design, investigators use correlation statistical test to describe and measure the degree of relationship between two or more variables or set of scores. This opinion also implies that the researchers in this type of research do not attempt to control or manipulate the variables as in experiment; instead they relate using the correlation statistics. Specifically, this study used the explanatory correlation research design since this study was just to investigate the degree of association between online teaching and students' learning outcome.

Area of study

The area of study was the centre region, with its 10 divisions and 54 sub-divisions to represent the whole Country. The Centre Region (French: Region du Centre) occupies 69,000km^2 of the central plains of the Republic of Cameroon. It is bordered to the north by the Adamawa Region, to the south by the South Region, to the east by the East Region, and to the west by the Littoral and West Regions. It is the second largest of Cameroon's regions in land area. Major ethnic groups include the Bassa, Ewondo, and Vute. Yaounde, capital of Cameroon, is at the heart of the Centre, drawing people from the rest of the country to live and work there (source: https://en.m.wikipedia.org/wiki/Centre_Region). Yaounde serves as an important industrial centre and provide good educational facilities in the Higher education such as online teaching in some higher institutions. Since online teaching is still considered as a young phenomenon in Cameroon, its partial or complete absence in most regions of Cameroon permitted me to use the Centre Region as the area of study to represent the whole country in online education.

Population of the study

According to Creswell (2012), population is a group of individuals who have the same characteristics. In the same line, Popoola (2011) defines population of the study as the 'totality of the items or objects under the universe of study. It often connotes all the members of the target of the study as defined by the aims and objectives of the study'. It was based on this that all the students undergoing online education in Cameroon were considered as the population of the study. For a convenient and easy study, the population of the study was broken down into the target and accessible population.

Target population

The target population consists of all members of all the online students in Cameroon to which the results of the investigation shall be applied. Due to the fact that not all the students undergoing online education could be reached in this study, the target population of this study was all the online students in the ICT University and the National School of public works in Yaounde.

Accessible population

Due to the fact that all the online students in the ICT University and the National School of Public Works could not be accessed due to some factors such as the fact that the National School of Public Works did not offer online teaching this year and other factors like time and finances, the accessible population of the study were all of the over 350 online students of the ICT University.

Sample size and technique

Sample size

In quantitative approach, a sampling frame is a group of individuals with some common defining characteristics that the researcher can identify and study (Cresswell, 2012). The sample frame of this study from which the sample had been selected involves all the online students of the ICT University which included all the students from level two right up to PhD with the exception of the level one since they were not undergoing online teaching. From a population of over 350 online students, a sample size of 187 was deemed sufficient to generalize the results of the study as clearly analyzed by the sampling technique. From all the online lecturers, 15 online lecturers were observed. The online students were between the ages of 17 and 30+ years and consisted of the 2nd, 3rd , masters and Ph.D students. The 15 online lecturers that were observed were teaching online classes and it included all the levels and all the departments of the university.

Sampling technique

In determining the sample, the researchers employ either probability or non-probability sampling approaches (Creswell, 2012). In order to get relevant and authentic information about the online teaching on students' learning outcome, respondents were selected using the probability sampling technique. Probability Sampling is a sampling technique in which sample from a larger population are chosen using a method based on the theory of probability. For a participant to be considered as a probability sample, he/she must be selected using a random selection (www.QuestionsPro.com). In this research, the probability sampling with simple random sampling was employed. In this form, the researcher selected participants for the sample so that any individual had an equal probability of being selected from the population. This was done by assigning numbers to the individuals (sample) and then randomly choosing from those numbers through an automated process using the lottery method. The numbers that were chosen were the members that were included in the sample. To determine the sample size, the Yamane (1967) simplified formula for proportions at a 95% confidence level and 5% level of precision was used.

Mathematically,

$$n = \frac{N}{1 - N(e)^2}$$

Where n is the sample size (187), N is the population size (350), and e is the level of precision (0.05. When this formula was applied to the above sample, we got the following;

$$n = \frac{N}{1 - N(e)^2} = \frac{350}{1 - 350(0.05)^2} = 187 \text{ students}$$

Accordingly, 187 online students were used to collect quantitative data through the questionnaire and 10 online classes were used to collect qualitative data through a structured observation guide.

Reliability of the Instrument

According to Sekaran and Bougie (2013), reliability is the degree to which an assessment tool produces stable and consistent results. This refers to the extent to which results are consistent over time. The research instrument is considered to be reliable and accurate when the results of a study can be reproduced under a similar methodology.

This study tested for inter-rater reliability and average inter-item correlation reliability. Inter-rater reliability is used to assess the degree to which different judges or raters agree in their assessment decisions. This is useful because human observers will not necessarily interpret answers the same way. A Cronbach's alpha of 0.995 was gotten after calculation. This shows that 99.5% of the data collection instruments were acceptable for data collection. The descriptive research study established that the questionnaire and observation guide were reliable and suitable for data collection. The study recommended modification to some questions in order to meet the reliability of the instrument for this study.

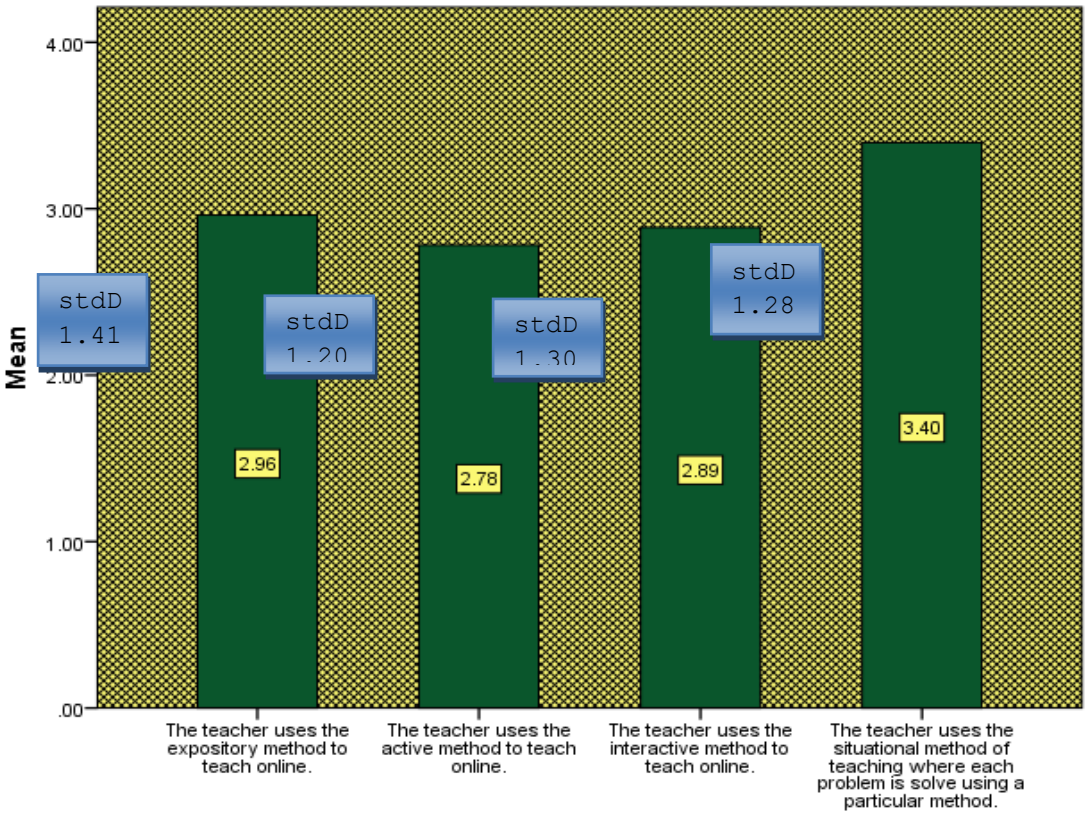
Method of Data Analysis

Data that was obtained through questionnaire was analyzed using SPSS for windows version 20 based on table 3 below. Descriptive statistics was done using bar graphs, sample population(N), mean and standard deviation(SD). Inferential statistics such as Pearson Product Moment Correlation (rxy) was used to analyze the data collected through questionnaire. The data collected from online students through closed ended items of the questionnaires that respondents background information especially, their gender, age, rating of online skills, effectiveness of learning online, online learning enjoyment and media familiarity were analyzed by using bar graphs and percentages. The questions related to proportion online (from question 7 to 10), pedagogical approach (from question 11 to 14), communication synchronicity (from question 15 to 18), and instructors knowledge in online teaching (from question 19 to 22) on learning outcome(from question 23 to 30) were analyzed using the bar graphs showing the mean and standard deviation per question. The questions on each variable were combined to form one variable and its relationship with learning outcome was tested using rxy. At the end, to test the relationship between online teaching on learning outcome, all the questions on online teaching were combined to form one variable and its significance with learning outcome was tested using rxy. Data collected from the observation guide was analyzed using Microsoft Word 2016. This was done by extracting comments and interpreting the results to judge the level of relationship that exists between online teaching and learning outcome.

Results and discussion

Descriptive statistics

Chart 2: Respondents' opinions on pedagogical approach on learning outcome.



Source: Field work, 2019

According data from the questionnaire on chart 2, item 11 on whether the teacher uses the expository method to teach online has a mean of 2.96 and a standard deviation of 1.41, from respondents' opinions 30(16.0%) of the respondents were in strong agreement, 60(32.1%) respondents agreed, 23(12.3%)respondents were neutral, 35(18.7%) disagreed and 39(20.9%) strongly disagreed. This means that most lecturers use the expository method to teach online.

Item 12 examined the respondents' opinions on whether the teacher uses the active method to teach online. It has a mean of 2.78 and a standard deviation of 1.20. As concerns respondents' opinions, 23(12.3%) strongly agreed, 77(41.2%) agreed, 18(9.6%) were neutral, 56(29.9%) disagreed and 13(7.0%) strongly disagreed. This means that most lecturers use the active method to teach online. A learner-centered approach acknowledges what students bring to the online classroom—their background, needs, and interests—and what they take away as relevant and meaningful outcomes. With the instructor serving as facilitator, students are given more control and responsibility around how they learn, including the opportunity to teach one another through collaboration and personal interactions (Palloff & Pratt, 2013).

Item 13 investigated the respondents' opinion on whether the lecturers use the interactive method to teach online. The results in chart 1 indicates the summary of respondents opinions with a mean of 2.89 and 1.30 as the standard deviation. Responses from the respondents shows 27 (14.4%) of the respondents strongly agreed, 65(34.8%) respondents agreed, 21(11.2%) of the respondents were neutral, 50(26.7%) disagreed and 24(12.8%) strongly disagreed to this fact. This shows that few lecturers use interactive method to teach online. Research

has found that online instruction is more effective when students collaborate rather than working independently (Means et al., 2010; Schutte, 1996). There are a variety of ways for students to collaborate online, including synchronous and asynchronous discussions and small group assignments. In addition, the relative anonymity of online discussions helps to create a "level playing field" for quieter students or those from typically marginalized groups. When posed questions in advance, students have the opportunity to compose thoughtful responses and have their voices heard, as well as respond to one another in a manner not usually afforded by face-to-face instruction (Kassop, 2003). This means their learning outcome is highly affected due to minimal interactive teaching as some students learn effectively from interactions.

Item 14 investigated the respondents' opinions on whether the lecturers use the situational method of teaching where each problem is solved using a particular method. The summary of respondents opinions on chart 2, shows a mean of 3.40 and a standard deviation of 1.28. From the respondents' opinions, 22(11.8%) strongly agreed, 25(13.4%) agreed, 35(18.7%) neutral, 67(35.8%) disagreed and 38(20.3%) strongly disagreed. This shows that most lecturers do not use the situational method of teaching where each problem is solve using a particular method. Different online pedagogical approaches promote different learning experiences by varying the source of the learning content and the nature of the learner's activity (Galvis, McIntyre and His 2006).This means that for online teaching to positively influence students learning outcome, lecturers must practice the situational method of teaching where each problem is solved using a particular method.

According to data from the observation guide, pedagogical approach was divided into expository, active and interactive. In the first observation class, in the course of teaching, the expository, active, interactive, expository and active, and active and interactive approaches. There was also the use of the situational approach where all the three methods were used to solve a particular problem. In the second observation class, in the course of teaching, the expository, active, interactive, active and interactive approaches were used. It was mostly teacher's centered. Interaction between purely online students and blended students was very poor because there was no communication. In the third observation class, in the course of teaching, active and interactive approaches were used. It was mostly teachers centered. In the observations in the education department, in the course of teaching, the expository, active, interactive, and expository and active were used. The teaching was mostly teacher's centered since the communication between the purely online student and blended students was very minimal. From this result, we ca see that most online teaching is lecturers' centered meaning that the active method of teaching is the highest method that is used. This reduces the learning outcome of students due to the fact that there is limited expository teaching and little or no interactive teaching.

Test of Hypothesis

Verification of research hypothesis, H_2: There is a significant relationship between pedagogical approach and learning outcome.

Correlations			
		Pedagogical Approach	Learning outcome
Pedagogical Approach	Pearson Correlation	1	.985**
	Sig. (2-tailed)		.000
	N	187	187
Learning outcome	Pearson Correlation	.985**	1
	Sig. (2-tailed)	.000	
	N	187	187
**. Correlation is significant at the 0.025 level (2-tailed).			

The test was to verify whether there is a significant relationship between pedagogical approach and learning outcome or not. The Pearson Correlation Coefficient of .985 at 95% confidence level shows a very high positive significant relationship between pedagogical approach and learning outcome. This shows that the significant relationship is at 98.5% which is very high. This means that the more efficient and effective the pedagogical approach, the higher the learning outcome of online students and vice versa. Thus the null hypothesis that there is no significant relationship between pedagogical approach and learning outcome was rejected and the alternative hypothesis was retained. Therefore, it was concluded that there is a significant relationship between pedagogical approach and learning outcome.

Implication and Conclusion

From the analysis, it was found that there is a very high positive relationship between pedagogical approaches in online teaching and learning outcome (r = 0.985). The relationship is statistically significant at 0.05(a 5% chance of error) level of significance. This implies that increase in pedagogical approach (like expository, active and interactive methods) helps to enhance students' learning outcome. The findings indicated that a majority of students agreed that the lecturers use the expository method to teach online and a moderate usage of the active method to teach online. This showed that most lecturers use the expository method to teach online which is highly lecturers' centered and considers the students the students as empty vessels who have to be filled with knowledge. This does not predict well for students' learning outcome as most students' learning needs are not always taken into consideration. It also showed a moderate use of active which is purely students'

centered. This means that the learners' needs are not fully taken as the Centre of teaching as the case should have been, this hinders students' learning outcome. It also indicated that barely a majority of the lecturers use the interactive method to teach online. This does not predict well for effective online teaching and good students' learning outcome as online teaching according to most researchers is supposed to be mostly interactive with the students and lecturer(s) fully involved. Most lecturers do not use the situational method of teaching where each problem is solved using a particular method. Students who learn through the combination of active, interactive and situational methods have enough time to perform interactive activities due to fact that they always with their mates during classes, have enough time to ask questions and search for answers or participate in hands-on learning than in expository method teaching. This does not mean that expository method is not important, the fact is true that no specific approach is pure in its entity but using the methods interchangeably can improve learners outcome. This showed that students' learning outcome increases with the situational method of teaching where there in no use of a specific method. From the results, it can be concluded that the situational method of teaching online is minimally used in the ICT University. This does not show a good footing for online teaching in the University as the phenomenon is still very new to most Higher institutions in Cameroon and these results from situational method of teaching can act as a barrier to its implementation in some Universities.

The study showed that better students learning outcome in the ICT University might be well improved through pedagogical approach by online teaching. The study concluded that; the way lecturers teach online using expository, active and interactive methods might have a significant effect on students' learning outcome in the ICT University.

Recommendations

Based on the above conclusions, the following recommendations were forwarded to be the remedy of the effect by concerned bodies to alleviate and to improve the online teaching which are associated with learning outcome in the ICT University.

Recommendations to the teachers (lecturers)

- Acquire new skills and new expectations of the educational practice of online teaching through constant attendance of seminars and research. With the advent of online teaching as a result of advancement in technology, teachers are expected to have the required skills to meet the expectations of online teaching. So this research can guide and equip teachers with some new skills needed for online teaching.
- Pursue professional development opportunities to prepare them for their new roles. The effectiveness and efficiency of an online teacher depends on his/her ability to pursue professional development opportunities to better up his/her skills in online teaching. The findings of this research can guide, prepare and direct teachers on some professional development opportunities.
- Develop agreements about the intellectual property rights of courses delivered online. Online teaching comes with a lot of differences from traditional teaching thus showing its uniqueness. This research can

guide teachers on the best practices of online teaching through an improvement in lecturers' knowledge in online teaching .

- ❖ Continuously mentor new entrants into this new teaching and learning environment. As an experienced online instructor that some teachers are, their role is to teach and mentor their colleagues who are new into the online teaching. New teachers should always ask for help whenever they have difficulties and also make thorough research to improve on their skills.
- ❖ Collaborate with colleagues and administrators to develop new strategies and support systems for delivering online education. New teachers in online education with the help of this study can learn to collaborate with colleagues who are experts in the field and the school technicians in order to grow in their online teaching skills.

Recommendations to the Higher institutions

- ❖ Ensure educators who instruct online receive comprehensive preparation for this medium. Workshops and seminars provide professional development opportunities for online teachers. Higher institutions practicing online learning should constantly organize training workshops and seminars so as to enable educators to receive comprehensive preparation for the medium.
- ❖ Develop language for determining the intellectual property rights to online courses by clarifying the skills/terminologies of specific online courses.
- ❖ Allow lecturers adequate preparation time for the development and delivery of online courses.
- ❖ Ensure lecturers have the technical infrastructure and technical support prior to initiating online education.
- ❖ Develop accountability mechanisms that assume instruction may occur beyond the normal school building or normal school hours.

References

Allen, I. E., & Seaman, J. (2010). *Learning on demand : Online education in the United States,* Retrieved from http://www.sloan c.org/publications/survey/pdf/learningon demand.pdf

Allen, I. E., & Seaman, J., with Lederman, D., & Jaschik, S. (2012). *Conflicted: Faculty and online education, 2012*. Washington, DC: Inside Higher Ed, Babson Survey Research Group, and Quahog Research Group.

Allen, I., & Seaman, J. (2007). *Online nation: Five years of growth in online learning.* Retrieved July 10, 2013, from http://www.bobbebaggio.com/Presentations/PADLA111208/online-nation.pdf

American Association Of Law Liberaries URL 3

Bilola, T. S. D (2015). *Evaluating the Strategic Objectives of Cameroonian Higher Education: An application of the Balanced Scorecard*. Research Unit for the Sociology of Education, University of Turku-Finland

Creswell, J. W. (2009). Research design: Qualitative and mixed methods approaches. London: SAGE.

Galvis, A. H., McIntyre, C., & Hsi, S. (2006). *Framework for the design and delivery of effective global blended learning experiences*. Report prepared for the World Bank Group, Human Resources Leadership and Organizational Effectiveness Unit. Unpublished manuscript.

Graham, C. R. (2005). *Blended learning systems: Definition, current trends, and future directions*. In C. J. Bonk & C. R. Graham (Eds.), Handbook of blended learning: Global perspectives, local designs (pp. 3–21). San Francisco, CA: Pfeiffer.

Jaggars, S. S. (2013). *Online learning in community colleges.* In M. G. Moore (Ed.), Handbook of distance education (3rd ed, pp. 594–608). New York, NY: Routledge

Jonassen, D. H., Lee, C. B., Yang, C.C., & Laffey, J. (2005). *The collaboration principle in multimedia learning*. In R. E. Mayer (Ed.), The Cambridge handbook of multimedia learning. (pp. 247–270). New York, NY: Cambridge University Press.

Kim K., Bonk C. J. (2006, January 1). *The future of online teaching and learning in higher education:* the survey says…, EDUCAUSE Quarterly. Available online at: http://www.educause.edu/ero/article/future-online-teaching-and-learning-higher-education-survey-says

Korenman L. M., Peynircioglu Z. F. (2007). *Individual differences in learning and remembering music: auditory versus visual presentation*. J. Res. Music Educ. 55, 48–64 10.1177/002242940705500105 [CrossRef] [Google Scholar]

Locke E. A., Latham G. P. (2002). *Building a practically useful theory of goal-setting and task motivation*. Am. Psychol. 57, 705–717 10.1037/0003-066X.57.9.705 [PubMed] [CrossRef] [Google Scholar]

Mebane M., Porcelli R., Iannone A., Attanasio C., Francescato D. (2008). *Evaluation of the efficacy of affective education online training in promoting academic and professional learning and social capital*. Int. J. Hum. Comp. Interact. 24, 68–86 10.1080/10447310701771498 [CrossRef] [Google Scholar]

Mick and Middlebrook search-based literacy pedagogy. *In Marohang Limbu & Binod Gurung (Eds.), Emerging pedagogies in the networked knowledge society: Practices integrating social media and globalization (pp. 120-143)*. Hershey, PA: IGI Global.

Murray B. (2000). *Teaching students how to learn. Monitor Psychol*. 31, 62 Available online at: http://www.apa.org/monitor/jun00/howtolearn.aspx [Google Scholar]

National Institute For Learning Outcomes Assessments (2011): *Assessing Learning in Online Education: The Role of Technology in Improving Student Outcomes* by Matthew Prineas and Marie Cini. Foreword by Peter Ewell

Njodzeven, B. T. (2014). *School processes and Teachers commitment*. An unpublished educational article

Porter, A. L., Pitterle, M. E., & Hayney, M. S., (2014). *Comparison of online versus classroom delivery of an immunization elective course*. American Journal of Pharmaceutical Education, *78*(5), 1-9. doi:10.5688/ajpe78596

Shelton, K., & Saltsman, G. (2005). *An administrator's guide to online education*. Charlotte, NC: IAP-Information Age.

Summers, J. J., Waigandt, A., & Wittaker, T. A. (2005). *A comparison of student achievement and satisfaction in an online versus traditional face-to-face statistics class.* Innovative Higher Education, *29*(3), 233-250. doi:10.1007/s10755-005-1938-x

Svenaake, B. (2014). *Pedagogical approaches in online education*. WordPress.com

Tetang, T. J. (2007). *SURVEY OF ICT AND EDUCATION IN AFRICA*: Cameroon Country Report. Available at www.infodev.org

U.S. Department of Education, National Center for Education Statistics. (2003). *Distance education at degree-granting postsecondary education institutions*, 2000–2001 (NCES 2003-017). Washington, DC: Author. Retrieved from http://nces. ed.gov/pubs2003/2003017.pdf

U.S. General Accounting Office. (2002). *Distance education: Growth in distance education programs and implications for federal education policy (Statement of Cornelia M. Ashby, Director, Education, Workforce, and Income Security Issues*. Testimony before the Committee on Health, Education, Labor, and Pensions, U.S. Senate [GAO-02-1125]).

Xu, D., & Jaggars, S. S. (2011a). *The effectiveness of distance education across Virginia's Community Colleges: Evidence from introductory college-level math and English courses*. Educational Evaluation and Policy Analysis, 33(3), 360–377

Xu, D., & Jaggars, S. S. (2013). *Adaptability to online learning: Differences across types of students and academic subject areas (CCRC Working Paper No. 54). New York, NY*: Columbia University, Teachers College, Community College Research Center.