International Journal of Trend in Scientific Research and Development (IJTSRD)
Volume 6 Issue 3, March-April 2022 Available Online: www.ijtsrd.com e-ISSN: 2456 – 6470

Digitalisation of Higher Education Instructional Processes and Effectiveness of State University in Cameroon

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ABSTRACT

This study aimed at investigating the effect of digitalisation of instructional process on the effectiveness of state Universities. The study was guided by two objectives which are to: investigate the extent to which digitalisation of instructional processes affect the effectiveness of State Universities, and to find out the challenges/barriers face in the digitalisation of instructional processes in State Universities. The study was guided by one hypothesis. The survey research design using the convergent mixed method was adopted for the study. A sample of 371 academic staff and 24 administrators were selected for the study using the purposive, convenient and proportionate sampling techniques. Questionnaire and interview guides are the instruments adopted for the study. The reliability of the instrument was measured using the Cronach Alpha test and the coefficient value stood at 0.923. The quantitative data were analysed using SPSS version 25 with the aid of descriptive and inferential statistics while the qualitative data were analysed thematically. The findings showed that the digitalisation of instructional process in State Universities is moderate as indicated with a mean value of 2.78 with the inferential statistics showing that digitalisation of instructional process has a significant and positive relationship with the effectiveness of State Universities ($R= 0.444^{**}$, $P= 0.000 < 0.05$). In support of this, many of the respondents 311 (89.9%) said the digitalisation of instructional process is relevant in that it will improve on teaching and learning, improve on university effectiveness and efficiency, promote distant learning/increasing access, enhance research, limit the spread of covid 19, improves on teacher-student relationship, ensure effective management of students, reduce time wastage, ease monitoring and evaluation, reduce physical class size and improve on content coverage. Despite these enormous benefits, the findings also showed that poor internet connection, lack of finance, power failure, inadequate policies, lack of skilled staff, lack of digital tools, lack of knowledge on the use of digital tools, resistance to change, lack of infrastructures and poor decision making are barriers to the digitalisation of instructional process in State Universities. In conclusion, it was observed that there is a positive link between digitalisation of instructional process and the effectiveness of state Universities in Cameroon. Based on this, it was generally recommended state Universities should digitalised their instructional process to enhance the effectiveness of states Universities while also making sure that good internet connection, steady electricity supply and good policies guiding digitalisation of management processes are put in place.

KEYWORDS: *Digitalisation, Digital of Higher Education, Digitalisation of Instructional, Process, Challenges to Digitalization, Effectiveness, State Universities*

How to cite this paper: Dr. Momenyi Mirabel Tangmo | Professor Fonkeng Epah George | Dr. Emefua Rose "Digitalisation of Higher Education Instructional Processes and Effectiveness of State University in Cameroon" Published in International Journal of Trend in Scientific Research and Development (ijtsrd), ISSN: 2456-6470, Volume-6 | Issue-3, April 2022, pp.306-322, URL: www.ijtsrd.com/papers/ijtsrd49523.pdf

IJTSRD49523

INTRODUCTION

Horace Mann, father of U.S schooling had long reiterated for the kind of education system that would best serve children and the society at large. By that, Horace was making allusion to excellence and by extension to the concept of effectiveness. In an attempt to become effective and excellent, Universities are moving towards digitalization, thus moving out of the old ways of delivery processes in higher education. In Cameroon, three of the objectives of the university reforms of 1993 were to provide all Cameroonians with equal opportunities of obtaining university education; make programmes more varied, professional, adapted and responsive to the needs of the job market; and make Universities more accessible to local, regional and international communities. Presently, the mission and vision for most universities in Cameroon incorporate e-learning. The purpose for e-learning is not only to increase access to education but, it also aimed to enhance effectiveness in teaching learning process.

E-learning is an aspect of digitalisation and, digitalization is seen as the integration of digital technology in education system to improve on pedagogic and non-pedagogic activities. Lekhi (2007) states that digitalisation has changed all sectors of society, the way people work, live, communicate, and interact. In addition, the benefits brought about by technological change is affecting everything from infrastructure to administration, learning materials, research, methods of teaching, learning and assessment in the education sector. Thus, a critical look at Lekhi's opinion indicates that digitalization of Higher Education delivery processes would improve on its effectiveness if appropriately used. Patrick and Maria (2011) had said that when students are planning to study in the University, one of the things affecting their choice of University is digital technologies. This is to say that digitalisation of university processes is somehow important in their decision about where to study. The fact that higher levels of technological skills correlate with higher wages (Falck, Wiederhold, & Heimisch, 2016), and the jeopardy of job losses in the future due to digital technology (Hirschbuhl, & Bishop, 2000), HE institutions and other institutions have to implement digitalisation strategies that will foster the acquisition of 21st century skills by students for, this would enable them to be more effective in the use technology, be flexible, adaptive and innovative (Oliver & Jorre de St Jorre, 2018; Redecker, 2017). It is based on this that this paper focuses on the effect of digitalisation of instructional processes on the effectiveness of state Universities in Cameroon.

Background to the Study

Although significant efforts are being made by the government through major projects like construction of multimedia resource centres in selected public schools with Internet connection, construction of telecommunication network linking all State Universities and higher institutes of learning and research, the offer of 500,000 laptops to university students by Cameroon's Head of State, much still needs to be done. State universities in Cameroon have to make sufficient use of ICT tools in their delivery processes. This is so because the strategic plan for the development of the digital economy is anchored on the Cameroon Vision 2035 and the GESP which aim at turning Cameroon into a digital country. The transformation of Cameroon into digital economy is underpinned by three key dimensions; adapting and updating the legal, statutory, and institutional framework; improving the quantity and quality of services provided and making them affordable; and increasing the use of ICT and the industrial fabric of ICT companies (Republic of Cameroon, 2009). From the three above dimensions, it is important that state universities in Cameroon be actively moving in the same direction for better digital economy and to improve on quality of service.

Kühn Hildebrandt (2019) states that the digitalisation of instructional process through the use of Google Classroom, WhatsApp, YouTube, Skype, Simulations, Telegram, Wikipedia, involve training students in digital competencies as part of their higher education experience is imperative in empowering in the digital spaces and also vital in preparing students for the unavoidable shift instigated by digital transformation since is affecting every part of societal and professional life (EDUCAUSE, 2018). In support of this, Blaschke and Hase (2015) said that the use of digital technology makes teaching and learning more enjoyable while increasing student activity and lifelong learning skills. Minishi-Majanja (2007) had long opined that digitalisation is an impetus for change from the traditional concepts of teaching and learning, as well as, a prime motivation behind the change in scholarly and professional activities. Also, the relevance of digitalisation in higher education delivery processes has been recognized by researchers such as Siragusa and Dixon (2009) to enhance effectiveness. This implied that to address quality education delivery, the use of digitalisation cannot be over emphasised.

Yang (2008) had encouraged higher education institutions to search for ways to effectively train the students in the required skills and to guarantee that the students who graduate will be creative,

competitive and critical thinkers. Digitalization encompasses transformational tools such as Google classrooms, Wikipedia, skype, Facebook, etc. which, when applied appropriately, can promote the move from the traditional teacher centered to a learner-centered learning environment and in turn enhance the quality of higher education and management systems. Most University leaders are opting for a 'middle ground' in terms of changes to the current University model with three-quarter planning to partly digitise their current operations, and at the same time are contemplating the creation of new digital models. While almost all University leaders expect higher education to be disrupted in the next ten to fifteen years, very few are planning to fundamentally create a new digital model for their University, perhaps indicating a high level of confidence about the place of the traditional University model in a disrupted higher education landscape (Patrick & Maria, 2011).

The new policy on university governance in Cameroon laid down in decree No. 2005/383 of 17th December 2005 was aimed at improving governance of higher education in four perspectives (managerial, academic, financial and social governance). The decree emphasizes efficiency, effectiveness, management with rigour transparency and results. With interest in academic, it is belief that effective digitalisation of higher education can contribute to improve on academic. The Bologna Process is one other major reform aimed at shaping Higher Education and digitalisation has not been ignored within the Bologna Process (Orr et. al, 2018).

Statement of Problem

Regardless of the 1993 reforms and 2001 laws on orientation of Higher Education in Cameroon, and other verdicts, the problem of ineffectiveness in Higher Education Institutions in Cameroon is unsolved. The coming of digitalisation presents some optimism to enhance effectiveness in state Universities. It has been observed that all state Universities have vision for e-learning which is a strategy not only to increase access but, also to impact students with the 21st century skills. Despite this vision, state Universities are still face with lot of difficulties ranging from lack of infrastructures to support e-learning and the lack of digital skills/knowledge by it users and staff. With these difficulties face, the vision of e-learning may hardly come by or if comes into existence, it may be ineffective. The increased number of students seeking admission into the Universities makes it challenging for state Universities to continue with the old ways of carrying out teaching and learning. Higher education is supposed to provide highly trained individuals rich in technological skills capable of bringing economic change needed for development. It has been hypothesized that the rate of joblessness in the nearest future will increase if graduate continue to leave school without digital skills.

The vision of e-learning in higher education institutions is not only geared toward increasing access to education but, it is also aimed to enhance effectiveness to enable the smooth integration of graduates into the fast growing technological world. The problem of ineffectiveness of state universities is not novel. It could be traced far back to the early 2000 when the new policy on university governance was laid down in decree No. 2005/383 of 17th December 2005 aimed at improving governance of Higher Education in four perspectives (managerial, academic, financial and social governance). Also, the aspect of increase access could also be traced far back in the 1993 reforms of higher education. Based on this, it is believed that the digitilisation of instructional activities can improve the effectiveness of State Universities as well as access. It is against these backdrops that the study is intended to investigate the extent to which digitalization of higher education instructional processes affect the effectiveness of state Universities in Cameroon.

Objective of the Study

The objectives of the study are to;

1. Investigate the extent to which digitalization of instructional processes affects the effectiveness of state Universities in Cameroon.
2. Find out the challenges faced in the digitalisation of instructional processes in state Universities in Cameroon.

Research Questions

The research questions to the study are;

1. To what extent does the digitalisation of instructional process affect the effectiveness of state universities?
2. What are the challenges faced in the digitalisation of instructional process in state Universities in Cameroon?

Hypothesis of the Study

Ho: There is no significant relationship between digitalization of instructional process and the effectiveness of state universities.

Ha: There is a significant relationship between digitalization of instructional process and the effectiveness of state universities.

Significance to the Study

It is hoped that the study would influence policy makers to provide adequate resources and provide

training to staff on the use of digital technologies access to education would increase both nationally and intentionally as programmes will be available online and people will be able to pursue their education, receive lectures irrespective of where they are. Also, this also significant in that graduates would be impacted with technological skill which is one of the 21st century skills that every graduate is expected to possess. Also, it is hoped that the study would provide teachers with greater opportunities for research and provide a broader framework for them to interact with other expects around the globe.

LITERATURE REVIEW

Conceptual Review

Digitalisation

The first contemporary use of the term digitalization in concurrence with computerization appeared in a 1971 essay first published in the North American Review. In that essay, Robert Wachal (in Sanders, 1974) discussed the social implications of digitalization on society. From that beginning, writing about digitalization has grown into a massive literature. Castells (2010) has view digitalisation as one of the defining characteristics of the contemporary era. In this sense, digitalisation has come to refer to the structuring of diverse domains of social life around digital communication and media infrastructures. Digitalisation has been outlined to incorporate variety of digital technologies, ranging from 5G to artificial intelligence, big data and Blockchain that is commonly used in big companies, industries and banks (OECD, 2019a). Therefore, is imperative for policy decision makers and other stakeholders to take into account these features, and consider the challenges posed by the process. Academics and people working in or with higher education institutions are aware that digitalisation can promote collaboration and efficiency in scientific research.

Digitalisation is an umbrella term that includes all technologies for manipulation and communication of information. Based on this, Desai (2010) said that digitalisation includes the use of all digital technologies that already exist to help individuals, businesses and organisations. Irrespective of the fact that Cameroon like most African countries is still in the initial stage of integrating ICT (Digitalisation) in education at large and higher education in particular, most European countries are making effective use of digital technologies in the higher education sectors. For instance, Denmark and Norway have been at the frontline in developing digital solutions for the public sector, and their citizens are at the forefront in relation to using information and communication technology (ICT) in everyday life.

Higher Education and Digitalisation

Digitalisation of education involves various aspects of quality, ranging from organisational issues, technological infrastructure to pedagogical approaches (Bates, 2015; Selwyn, 2016) and influences internationalisation by offering online and flexible educational programmes. Conole (2014) said that digitalisation in higher education provide solution to administrative problems, ensure systems security, empower higher education institutions to detect cheating, plagiarism, ease storage of research data, ease access to library services, support diverse learning and provide opportunities for better collaboration across campuses (Khalid et al., 2018). Digitalisation has been seen as a vital tool in making all stakeholders and policymakers to see the need for innovation in all higher education institution missions. This is because digitalisation is affecting and changing education and other domains such as research, and management activities. For instance, in-line with the study carried out by Momenyi, Fonkeng and Nyenty (2021), findings showed that digitalisation in higher education contribute significantly to improve on the administrative and curriculum activities in state Universities in Cameroon.

Therefore, the education system needs to take some serious measures for better adaptation to progress and take advantage of new the technologies for adequate digital transformation. It should be noted that higher education institutions can become the driver of digital innovation, including in the provision of the types of skills generally needed to navigate it. Stolterman and Fors (2006) states that for higher education institutions to deal with digital transformation, it has incorporate new digital processes in their management processes thereby, aiding students and staff to achieve the skills and competencies needed to effectively operate in the new digitalised societies and economies. In the digitalisation strategy for the higher education sector (2017-2021), Higher education and research is seen as complex and diverse. Therefore, it recommended that it would be necessary to place more operational aspects of ICT and digitalisation efforts in the higher education sector.

Although for example, Lai (2016) said the constant technological changes simultaneously create threats to established business models, it also offers opportunities for novel service offerings. With the advanced and dynamic growth of technologies and while business orgainsations are making effective use of technology to effectively manage and expand their

businesses, higher education institutions which are known for producing the workforce to contribute immensely to the growth of the nation at large should be at the forefront of digitalisation to improve on their delivery systems. In response to this, Lovelock (2001) and Lai (2007) said that in order for Universities to adapt to the global technological advancement, Universities should urgently rethink and upgrade their mission and strategy, and becoming intelligent organizations. Bratianu, Vasilache, and Jianu (2006) also added that higher education institutions must be and remain competitive by embracing technological innovations. Therefore, it is imperative that higher education institutions should support the implementation of digital-based processes for their own functional system and provide digital teaching and learning channels. Nowadays, higher education institutions are at the heart of European agenda policies and, they are considered main actors innovation systems and major stakeholders in generating and disseminating knowledge (Bejinaru, 2017a).

The Digitalisation of Instructional Processes in Higher Education Institutions

The coming of digital technologies in education processes is contributing in providing ample learning openings to those seeking for education from a far engaging in online learning. In the 21st century, learner success requires adequate mastery and acquisition of skills, competencies and knowledge in the use of ICT tools (Vawn Himmelsbach, 2019). Digitalisation of instructional processes entails carrying out teaching and learning online and making sure that materials are easily get via online/ in digital format. Digitalisation of instructional processes refers to the process of translating a piece of information such as a book, journal articles, sound recordings, pictures, audio tapes or videos recordings, etc. into bits. Bits are the fundamental units of information in a computer system. Converting information into these binary digits is called digitalisation, which can be achieved through a variety of existing technologies.

Sharma (2011) states that the appropriate use of digital technology can transform the whole teaching-learning processes leading to paradigm shift in both content and teaching methodology. This is to say that digital technology has the potential to transcend the barrier and space. The integration of technology in the field of education has contributed in improving the quality of education. It is widely believed that digitalization of higher education will help in making education more accessible and affordable. Sharma (2011) further opined that the increasing role of digitalisation makes education more democratic that is, improving the quality of education services available to even students sitting in far-flung remotest corners of the country. Sharma (ibid) states that one of the major advantages for using digital technology in the classroom has been to prepare the present and next generation of students for a workplace where ICT's, particularly computers, internet and others related technologies, are becoming more and more important. The new environment of interactive learner-centered approach of ICT has completely transformed the process of education that is delivery and dissemination. There is considerable hope that technology can expand and improve education at all levels with special reference to design and content of instructional materials, delivery, and assessment and feedback (Sharma, 2011).

It should be noted that in technology enhanced learning, the teacher's role will be more challenging and definitely different from what is presently observe in the traditional classroom teaching. In the new role, the teacher will be more of a director/coach or a facilitator because the technology enhances the quality of teaching and learning by arousing inquiry, curiosity and exploration. One could see that the modes of teaching in higher education have drastically changed in last 15 years. While some old guards still stay with the old "Chalk and Talk" technology, it is very rare to see these days a teacher not using some modern technology in classroom delivery. The digitalisation of education therefore has added new options for teaching, has created a wide variety of new courses, and has increased the enrollment in many academic institutions (increase access) aside teaching and learning (Kim & Bonk, 2006).

Thus, it is very important that higher education institutions and its leadership must consider the digital revolution program to continue and flourish. Higher education has been a topic of discussion in increasing marketisation globally because it competes for talent (students and staff), funding and prestige. Lane (2012) states that as Higher Education is recognised as playing a key role in building national competitiveness and contributing to a more equal and cohesive society, there is strong interest from a wide range of stakeholders in its impact (HEA, 2015). One of such impact is the quality of teaching and learning offered to students and graduates. DBEI (2018) stated that while the world of work is changing, higher education institutions must be aware of the evolving needs of employers and facilitates flexible learning pathways. By so that citizens can access educational opportunities and develop relevant skills to tackle current and future global challenges throughout their

lives. Digital technologies can be critical enablers of education, opening new avenues for learning and transforming the learning experience. Technology is changing the way children and young adults think and learn, including the ways in which they process information, their attention span, decision making and memory (Taylor, 2012).

Barriers to Effective Digitalisation of Higher Education

In the past years, studies have been carried out on students use of technology in learning in Australia, United States, Canada and Turkey and, they found out that students who are proficient in ICT, and collaborative are less resistant to change and they are also flexible thinkers (Barak, 2018). This is implies that resistant to change constitute one of the barriers to digitalisation of higher education institutions. Again, the lack of adequate digital skills by students is also another barrier. For example; Oliver and Jorre de St Jorre (2018) in their study indicated that student usage of technology in higher education is mostly limited to simple activities. Based on this, Margaryan et al. (2011) said that students need more explicit help in understanding why technology is important.

Furthermore, Henderson et al. (2017) and Parkes et al., (2015) in their research revealed that student preparedness for e-Learning environment was inadequate as many students were poorly. In support of this, Margaryan et al., (2011) in their own study had earlier reported that many students lack sufficient digital skills. Furthermore, Lai (2007) in their study of 880 students discovered that roughly 40% of students do not adequately use digital technologies for university purposes. This again could help explain the inadequate use of digital technologies in Universities by many students. The main factor to be taken here is that for effective digitalisation of public Higher Education institution in Cameroon to occur, not only the staff needs training and knowledge on how to use them, students on the other hand needs to be trained as well.

This is because digitalisation requires adequate competencies for those involved (Rientieset al., 2013). Rampelt et al. (2018) said digitalisation has not reached its full potential partly because digitalisation is view as an additional challenge, rather than a means to meet existing challenges for higher education. Today, over 90% of organisations/companies/institutions had indicated that they need employees with adequate knowledge and skills in ICT but, more than 75% of educators and students are lacking in the ability to meet the skills needs of the IT workforce. Research carried out by the World Economic Forum had revealed that 65% of pupils entering primary school will find themselves in jobs that today do not exist. Therefore, it is imperative for the education sector to prepare learners in skills needed for the digital economy (https://navajocodetalkers.org/12-advantages-and-disadvantages-of-technology-in education, 2019).

Effectiveness of Higher Education Institutions

Effectiveness is the ability to produce a desired result or the ability to produce desired outputs. Therefore, educational effectiveness is operation that address how to do things right (Rogers, 2003). It should be noted that graduates from an effective educational system are equipped with the appropriate skills for self-reliance and effectively contributes to economic development and the wellbeing of his or her family. Fonkeng and Ntembe (2009) have stated that given the high level of externalities associated with higher education, the role of the State in promoting investment in the sector should equally be enhanced. Socially, public education should guarantee access to quality education for all children. The problem of employability is usually linked to the failure of delivering education in terms of effectiveness and efficiency. Based on this, Harasim (2010) maintained that since effectiveness does not directly compare resource use or costs, what is effective is not necessarily what is most efficient. On this back-drop, many writers have concluded that, if we find anything that appears effective, it would be appropriate in developing policies to achieve it.

The digitalisation of higher education delivery processes in some European countries has been very helpful in improving the educational system of some advanced economy. Viljoen (1994) have said that it is easy to create an efficient organization than an effective one. Viljoen said that when students perceive an institution as effective, their interest in the institution is explicitly retained. Hughes and Bush (1991) had long states that achieving effectiveness and efficiency in higher education depends on public authorities creating the right framework within which higher education institutions can operate. Saiti and Prokopiadou (2004) said that cost-effective technology combined with flexibility in learning and administrative activities is essential to enhance efficiency and effectiveness in the higher education delivery system. In the educational context, academic institutions such as universities are complex social and activity systems, involving a number of interrelated variables and functioning within a larger dynamic environment.

Despite the fact that universities are partly or entirely state funded, they remain multi-purpose organisations that undertake teaching and research but also provide

a public service (working mainly for the good of the community). Organisations of this nature cannot be run like a private business that operates purely for its own benefit. Therefore, the need for effective system delivery is needed. The management needs to play a crucial role in identifying and understanding the major developments in academic institutions. According to Drucker (1973), effective public management protects democratic societies from sliding into totalitarianism which could result if public organisations not been effectively managed. Effective management of public sector organisations in Cameroon has remained elusive since independence as a result of systemic and institutional corruption. Effectiveness is a feature that can be attributed to any organization, private or public, for profit or non-profit, small or big (Dressler, 2004).

To be effective, public sector organizations need to respond to public perceptions regarding public needs and demands, and maintain equity in provision of public goods and services (Jones & Thompson, 2007). Mention is often made of effectiveness or ineffectiveness in most discussions on management of public sector organizations. To different people in different situations and environments, effectiveness means different things. In profit-oriented organizations, it often refers to monetary returns or outputs in respect of a given input (Siddiqi, 1995). However in a non-profit organization like higher education institutions, effectiveness means the ability of the institutions to attain it goals and objectives (Christensen, Lægreid, Rones & Rovik 2007). Effectiveness therefore, varies according to organizations and their goals. If effectiveness is simply seen as getting things done, going by the understanding of effectiveness as simply getting things done or goal achievement, in societies where corruption is systemic and institutionalized, by digitalizing it services, this would help to provide a quicker means for goal actualization which in that sense literally represents effective management.

Theoretical Review

Cognitive Flexibility Theory by Rand Spiro (1898-1980)

Educational Technology is increasingly developed and the 21st Century is characterized by the development of media technology. Technology in education is has brought lot of changes in fields, including education. The invention of computer and networking technology, technology in media, and digitalisation, has affected daily life. The Cognitive Flexibility Theory was coined by Rand Spiro and others. The Cognitive flexibility theory states that while learning must have its specific environment, it should gain informational support from various fields. According to Cognitive Flexibility Theory, technology supports the designing of artificial intelligence system and educational technology influence students' learning outcomes.

History has shown that the technology has affected education, it development and classroom activities. In as much as educational technology is only a tool, the effectiveness of using them depends greatly on how teachers interact with students during learning process and how teachers select educational technology related theories, and implement them in specific instructional activities. Educational technology specialists do not only see a computer as an electronic device but, a tool that can also be used to facilitate learning. Supporting the instructional environment, with computing technology has brought forward a new way of thinking in relation to instruction and learning, and has also set new goals and objectives in education. Artificial intelligence system in education (Digitalisation) is a way of bringing artificial intelligence into instructional activities. Digitalisation in education has help in simulating teaching and learning processes. In support of this, research has shown that, since 1990s, artificial intelligence through digitalisation in education has helped people understand how to apply educational artificial intelligence effectively in instruction and learning to guide classroom instruction and learning activities (Issroff & Scanlon, 2002).

Chikatla and Reese, (2009) stated that cognitive flexibility theory helps establish a hypertext computer assisted instruction environment. This theory is important in this study in that, the study aimed to examine the extent to which digitalisation of instruction (teaching/learning process) influences the effectiveness of State University in Cameroon. The cognitive flexibility theory as reviewed in this study has clearly explained the relevance of educational technology to the instructional processes (teaching/learning). The cognitive flexibility theory has made us to understand that with the implementation of digital technologies in higher education institutions, teachers and students stand a better chance to be exposed to a variety of knowledge from different sources with the use of lesser resources.

Fullan Change Theory, a Force for School Improvement (2006)

According to Fullan Change Theory for School Improvement (2006), he stated in order to understand the need for school improvement; literature on educational innovation and literature on organisational change are required. Literature on

educational innovation suggests that elaborate procedures of planning and preparation are necessary to effect such a change and that the degree of involvement of the participants is crucial to success. That is, the more the participants perceive the innovation as instrumental to realisation of their own goals, the better the chances of success. This implied that an extended process of preparation is necessary to involve participants and achieve their commitment to the change before actually implementing it. Literature on organisational change, on the other hand, suggests that at times it can be effective to apply some force. Several studies have demonstrated that ICT investments are beneficial for performance and productivity (Hitt and Brynjolfsson, 1996).

However, the implementation of an ICT system always entails both organizational and individual changes (Rogers, 1995) Fullan (2006) in his theory of change for school improvement stated that for effective change to take place within an institutions, there must be effective capacity building. This is so important in that digitalisation of state Universities in Cameroon which is a change process moving from analog (manual) to digital platforms, requires substantial capacity building for actors who are to use it to avoid resistance or a short fall. By so doing, this might help overcome some of the barriers to the implementation of digitalisation.

METHODOLOGY

Research Design: The survey research design was adopted for the study using the convergent mixed method approach. This convergent mixed approach was adopted because the researcher collected both the quantitative and qualitative data at the same time to provide adequate data for the study.

Population of the Study: The population of the study is comprised of 4,620 academic staff and administrators in eight (08) state Universities in Cameroon such as Vice Chancellors, DVCs/TIC, Registrars, Deans, Directors and HODs.

Target Population of the Study: Participants for the study were sample from four state Universities which are; University of Buea, University of Bamenda, University of Douala and University of Yaoundé I. Based on these four Universities, the total number of academic staff is 2,718.

Sampling Technique and Sample Size: The purposive, convenient and proportionate sampling techniques are the three types adopted for the study. The purposive sampling technique was used because the four state Universities were purposively chosen while academic staff and administrative officials working were sample using the convenient sampling technique. The proportionate sampling technique was also used because the number out of the 371 academic staff and 24 administrators that made up the sample size for the study, a definite number was sample from the four targeted universities.

Instrumentation: In this study, the questionnaire and interview guides are the instrument adopted for the study. The questionnaire was used because enable the researcher to collect data from a large number of academic staff while the interview guide was used to capture the views of a few top administrative officials in each of the state Universities.

Reliability of the Instrument: The reliability of the instrument (questionnaire) was measured using the Cronbach Alpha test with data collected from on 20 academic staff in one of the state Universities that was not sample for the final study and the results showed that the questionnaire was reliable for the study with the Cronbach Alpha value stood at 0.923 above the recommended threshold of 0.7.

Data Analysis: The quantitative and qualitative approaches were use in analyzing the data collected for the study. The quantitative data were analyzed using SPSS version 25 with the aid of descriptive and inferential statistics. The descriptive statistics used are frequency, percentage, mean and standard deviation while, the Spearman rho test (inferential statistics) was used to test the hypothesis of the study. The qualitative data on other hand were analyzed using the thematic analysis approach. Finally, statistics were presented at 95% confidence interval with alpha set at 0.05 levels.

Findings

Question One: To What Extent does the Digitalization of Instructional Processes Affect the Effectiveness of State Universities?

Table 1: Academic Staff's Opinion on Instructional Processes

Opinion Statements	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Standard deviation
The university offers online learning/classes using Google classroom.	75 (21.7%)	164 (47.4%)	83 (24.0%)	24 (6.9%)	2.84	.843
The university has made some books available online for students and teachers to use.	58 (17.0%)	135 (39.5%)	103 (30.1%)	46 (13.5%)	2.60	.922
Lecturers are capable of giving instruction online.	56 (16.2%)	233 (67.5%)	50 (14,5%)	6 (1.7%)	2.98	.614
The university has platforms for online learning.	77 (22.6%)	202 (59.2%)	47 (13.8%)	15 (4.4%)	3.00	.736
Lecturers have Google group for the dissemination of instructions to students.	58 (16.9%)	165 (48.0%)	83 (24.1%)	38 (11.0%)	2.71	.876
Many students are supervised online during their research work.	40 (11.6%)	170 (49.1%)	110 (31.8%)	26 (7.5%)	2.65	.782
Research assignments are given online.	54 (15.7%)	195 (56.5%)	81 (23.5%)	15 (4.3%)	2.83	.734
Lecturers are capable of evaluating students online.	51 (14.8%)	130 (37.8%)	112 (32.6%)	51 (14.8%)	2.53	.919
Some lecturers have created WhatsApp platforms to disseminate instruction to students.	150 (43.4%)	162 (46.8%)	26 (7.5%)	8 (2.3%)	3.31	.711
Lecturers sometimes mail notes to students.	93 (27.1%)	175 (51.0%)	49 (14.3%)	26 (7.6%)	2.98	.848
Lecturers sometimes offer lectures using Zoom app and Wikipedia.	73 (21.2%)	146 (42.4%)	83 (24.1%)	42 (12.2%)	2.73	.933
Lectures are offered to students via instagram, twitter, emor and telegram.	54 (13.1%)	88 (25.7%)	110 (32.1%)	100 (29.2%)	2.23	1.012
Aggregate	**830 (20.1%)**	**1965 (47.6%)**	**937 (22.7%)**	**397 (9.6%)**	**2.78**	**0.827**

Cumulatively, findings showed that 239 (69.1%) of the academic staff agreed that their university offers online learning/classes using Google classroom. Findings also showed that 149 (43.6%) of the academic staff disagreed that their university has made some books available online for students and teachers to use. Findings equally showed 289 (83.8%) and 279 (81.8%) of participants respectively, agreed that lecturers are capable of giving instruction online and that the University has platforms for online learning. Findings also show that 223 (64.8%) of the academic staff agreed that lecturers have Google group for the dissemination of instructions to students. The results also indicated that 210 (60.7%) of the academic staff agreed that many students are supervised online during their research work. Findings also showed that 249 (72.2%) of the respondents agreed that research assignments are given online. 312 (90.2%) of academic staff also agreed that some lecturers have created WhatsApp platforms to disseminate instruction to students. 268 (78.1%) of the respondents also agreed that lecturers sometimes mail notes to students. Finally, findings also showed 219 (63.7%) of the respondents also indicated lecturers sometimes offer lectures using Zoom app and Wikipedia. In overall, findings showed 67.7% of the academic staff agreed that their instructional processes are digitalized while 32.3% of them disagreed. The average overall mean of 2.78 on a scale of 1-4 showed that the digitalisation of instructional processes in states Universities is moderate and, the low value of the standard deviation 0.827 showed that the respondents share almost the same opinion irrespective of their university.

Table 2: Academic Staff's Opinion on the Relevance of Digitalisation of Instructional Processes to their University

In your opinion, do you think that the digitalization of the institutions instructional processes will improve on the university's effectiveness and efficiency in activities?	Frequency	Percentage
Yes	311	89.9
No	35	10.1
Total	**346**	**100**

Despite findings on table 1 showed that digitalisation of instructional processes in moderate, findings on table 2 showed that a majority of respondents 311 (89.9%) accepted that the digitalisation of the university' instructional processes will improve on their university's effectiveness.

Table 3: Comparing Academic Staff's Perception of the Relevance of Digitalisation of Instructional Processes to State University's Effectiveness by Universities

University		In your opinion, do you think that the digitalization of instructional processes will improve on state University's effectiveness?		Total	Chi-Square Test ($\chi 2$)
		Yes	No		
Buea	n	41	6	47	$\chi 2=6.365$ df=3 P=0.095
	%	87.2%	12.8%		
Douala	n	95	17	112	
	%	84.8%	15.2%		
Bamenda	n	39	3	42	
	%	92.9%	7.1%		
Yaoundé I	n	136	9	145	
	%	93.8%	6.2%		
Total	**n**	**311**	**35**	**346**	
	%	**89.9%**	**10.1%**		

Comparing the academic staff's perception of the relevance of digitalisation of State University's instructional processes, findings show that in all the four State Universities, a strong majority of the academic staff; Buea 87.2%, Doulaa 84.8%, Bamenda 92.9% and University of Yaoundé I; 93.8% accepted that the digitalization of instructional processes will improve on State University's effectiveness and this perception of the relevance of digitalisation of State University's instructional processes not does significantly differ by universities (P= 0.095, > 0.05).

Table 4: Academic Staff's Opinion on how Relevant is the Digitalisation of Instructional Processes in State Universities

Themes	Groundings	Sample Quotations
Improves on learning and teaching	95	"It will facilitate the teaching and learning process and therefore, impact the development of digital skills of both students and teachers" "Introduces learners to a wealth of materials and facilitate learning out of classroom and anywhere". "This helps to facilitate learning processes for the students". "It will enable students to access more study materials" "The will help improve on students learning". "This will improve on students' learning". "This helps to facilitate students learning". "This will facilitate the learning process especially during time of restriction (Covid 19)".
Improves on effectiveness and efficiency	89	"Having information online improves on effectiveness because students can study even at home and make use of all online study materials". "Improves on effectiveness". "I think the digitalization of instructional processes will improve the

		effectiveness and efficiency of the University". 'Effectiveness will be attained'. 'If instructional processes are digitalized, it will improve on effectiveness and efficiency". Effectiveness will be ensured even during crisis while efficiency will be attained at all-time relative to content".
Promotion of distance learning/ Increase access to university education	76	"Promotes distance learning and allows physical contact only when necessary'. 'This will enable distance learning to take place especially in contexts similar to covid 19 lockdown". 'This will limit the unnecessary movement of teachers and students". "It makes distant learning possible hence; the University can have students and lecturers in any part of the world". "It gives room for teaching and learning to continue taking place irrespective of barrier measures put in place". "Because it limits distant barrier" "Due to the overcrowding of the students and lack of infrastructure, this process will help more students to have access to education".
Enhances research	37	"It encourages research". 'More personal research will be carryied out". "This will open the way for academic flow and intelligence. It will enable the stakeholders to participate in higher education system and improve on the flow of knowledge and research". "This will help improve on research". "Facilitates effective education and research",.
Limits spread of covid 19 by making e-learning possible	34	'This would help to reduce the spread of covid 19". "The spread of covid 19 will be reduced". 'With the covid 19 pandemic, it will be easier to teach students". "E-learning can easily take place and with restriction measures like in the case of covid 19 pandemic, learning will still take place"
Improves on teacher-student relationship	12	"This will help to improve on teacher-student relationship". "This will establish a healthy relationship between students and teachers thereby enhancing the study atmosphere". "It will build better relationship between teachers and students".
Better management the students	11	"This will make it possible to resolve the number of students in the faculty who are unable to take courses simultaneously". "Learning will be delivered to student on time and effectively" "There will be better management of the students" "Students' management become more effective"
Reduces time waste	2	"It will reduce wasting time". "It save students time".
Eases monitoring and evaluation	2	"The evolution of teaching and research will be monitored". "Better control of teaching and evaluation of students".
Reduces physical classroom size	2	"Because it will reduce the number of overcrowded classrooms". "This will help the students by reducing their number in classes that are usually full".
Improve on content coverage	1	"It helps the lecturer do much in covering course contents".

Based on how relevant is digitalisation of instructional processes to state Universities, many of the academic staff said it will improve on teaching and learning, improve on university effectiveness and efficiency, promote distant learning/increasing access, enhance research and limit the spread of covid 19. The academic staff also said digitalisation of instructional processes will improves on teacher-student relationship, ensure effective management of students, reduce time wastage, ease monitoring and evaluation, reduce physical class size and improve on content coverage.

Table 5: Academic Staff Opinion on the Effectiveness of state Universities

Opinion Statements	Strongly Agree	Agree	Disagree	Strongly Disagree	Mean	Standard deviation
Decision making in your institution is effective.	90 (26.4%)	166 (48.7%)	67 (19.6%)	18 (5.3%)	2.96	.820
The institution is efficient in carrying out its activities.	78 (22.7%)	172 (50.0%)	77 (22.4%)	17 (4.9%)	2.90	.801
There is effective attainment of the institution's goals and objectives.	68 (19.8%)	177 (51.6%)	88 (25.7%)	10 (2.9%)	2.88	.748
The outputs from the institution (graduates) are adequate in technological skills, a 21st century skill required by the job market.	73 (21.2%)	122 (35.4%)	109 (31.6%)	41 (11.9%)	2.66	.943
There is high transparency in the management processes.	64 (18.7%)	114 (33.2%)	127 (37.0%)	38 (11.1%)	2.59	.916
There is effective interaction between the university and the outside world.	78 (22.7%)	157 (45.6%)	94 (27.3%)	15 (4.4%)	2.87	.811
The quality of research and education is high.	68 (19.7%)	174 (50.4%)	87 (25.2%)	16 (4.6%)	2.85	.784
The university is relevant to it environment.	92 (27.0%)	173 (50.7%)	68 (19.9%)	8 (2.3%)	3.02	.751
The university is responsive to the needs of the economy (Cameroon).	95 (27.8%)	151 (44.2%)	73 (21.3%)	23 (6.7%)	2.93	.870
The university programmes are effective.	79 (23.0%)	184 (53.5%)	63 (18.3%)	18 (5.2%)	2.94	.788
Graduates easily fit into the job market.	67 (19.5%)	119 (34.6%)	116 (33.7%)	42 (12.2%)	2.61	.935
There is good governance in the university management processes.	68 (19.8%)	136 (39.7%)	95 (27.7%)	44 (12.8%)	2.66	.937
The university system is very competitive in terms of classification.	75 (21.8%)	123 (35.8%)	103 (29.9%)	43 (12.5%)	2.67	.954
Students can move from national to foreign universities without any problem.	86 (25.1%)	141 (41.2%)	82 (24.0%)	33 (9.6%)	2.82	.920
Aggregate	**1081 (22.5%)**	**2109 (43.9%)**	**1249 (26.0%)**	**366 (7.6%)**	**2.81**	**0.856**

Based on university effectiveness, findings showed that 250 (72.7%) of academic staff agreed that their University is efficient in carrying out its activities. Findings also showed that 98 (28.6%) of the academic staff disagreed that their University effectively attain it goals and objectives. 195 (56.5%) of the academic staff agreed that the outputs from the institution (graduates) are adequate in technological skills, a 21st century skill required by the job market, while 150 (43.5%) of them disagreed with findings also showed that 165 (48.1%) disagreed that there is high transparency in the management processes. Findings also showed that 235 (68.3%) of the academic staff agreed that there is effective interaction between the university and the outside world while 109 (31.7%) disagreed. Findings also showed that 186 (54.1%) of respondents agreed that graduates easily fit into the job market with 158 (45.9%) of them disagreed. Finally, findings also showed that 198 (57.6%) of the academic staff agreed that the university system is very competitive in terms of classification, while 146 (42.4%) of them disagreed. In aggregate, findings showed that 66.4% of respondents indicated that their university is effective while 33.6% of them indicated that their university is not effective. The average overall mean of 2.81 indicated that university effectiveness is moderate.

Question Two: What are the challenges faced in the digitalisation of instructional processes in state Universities in Cameroon?

Table 6: Barriers to the Digitalisation of Instructional Processes

Themes	Groundings	Sampled Quotations
No/poor internet connection	95	"Lack of reliable internet connectivity to match with the purpose". "We have problems with internet connection". 'We have serious problems with our internet connection". 'No internet connection". 'Poor internet connectivity/facilities". "Lack of internet facilities". "Lack of internet connection". "Power communication network".
Lack of finance	75	"Lack of finance" "I think there's lack of finance". "Financial barrier". "Lack of funds". "Financial constraints". "Lack of financial resource".
Power failure/no electricity	45	"Power failure". "Lack of electricity for smooth functioning". "Electr icity problem". "Constant power failure". 'Instability of energy supply". "Lack of electricity is a major challenge"
Inadequate policies/lack of strong political will	45	"Lack of strong management policy to achieve the digitalization of all the service". "Lack of will from the top administration". "Lack of will". "Lack of a strong will from the top management". "Lack of will of the major funding body of the University which is the government". "Lack of will by the administration".
Lack of skilled staff	35	"Lack of skilled man power in the area of IT". "Lack of competent staff". "Lack of computer resource engineers". 'Lack of training in the necessary tools". 'Lack of sufficient skilled staff". "Lack of qualified personnel".
Lack of digital tools	30	"Lack of computers" "Lack of equipment like computers". "Lack of digital devices". "Lack of equipment and tools for digitalization". "No digital devices". "Lack of tools/equipment".
Lack of knowledge/ digital skills	20	"Lack of knowledge of some lecturers to use online resources". "Lack of computer skill and knowledge". "Lack of digital skill". "Poor knowledge on IT service". "Some lecturers are not computer literate".
Resistance to change	12	"Resistance to change". "Change resistance due to the fact that many people do not changing thing". 'Reluctance to change". "Difficulty in accepting change".
Lack of infrastructures	2	'Lack of infrastructures". 'Lack of infrastructural resources"
Poor decision making	1	"Improper decision making"

Based on the barriers to the digitalisation of instructional processes, findings showed that many of the respondents reported poor internet connection, lack of finance, power failure, inadequate policies, lack of skilled staff, lack of digital tools and lack of knowledge on the use of digital tools. Resistance to change, lack of infrastructures and poor decision making are other barriers to the digitalisation of higher education delivery processes.

Testing of Hypothesis : There is a Significant Relationship between Digitalization of Instructional Processes and the Effectiveness of State Universities.

Table 7: Relationship between Digitalization of Instructional Processes and the Effectiveness of State Universities

Test	Statistical Parameters	Digitalisation of Instructional Processes	Effective Delivery System in State Universities	Explanatory Effect of the Relationship in Terms of % (Cox and Snell Statistics)
Spearman's rho	R-value	1.000	.444**	87.7%
	P-value	.	.000	
	N	346	346	

****. Correlation is significant at the 0.01 level (2-tailed).**

Statistically, findings showed that there is a significant and positive relationship between digitalisation of instructional processes and effective delivery system in State Universities (R= 0.444**, P= 0.000, far less than 0.05). The positive sign of the relationship implied that State Universities are more likely to be effective in their delivery system when they make optimal use of ICT tools and internet in carrying out instructional activities. This relationship is supported with a high explanatory power of 87.7%. In support of this, findings from the descriptive results showed that 311 (89.9%) of academic staff accepted that the digitalisation of the university's instructional processes will improve on their University effectiveness in service delivery. Therefore, the null hypothesis was rejected while the alternative hypothesis that states that there is a significant relationship between digitalization of instructional processes and effective delivery system in State Universities was accepted.

DISCUSSION AND CONCLUSION

Findings have shown that the digitalization of instructional processes has a significant and positive effect on effectiveness of state Universities. In addition to this, the respondents said the digitalisation of instructional processes will improve on teaching and learning, improve on university effectiveness and efficiency, promote distant learning/increasing access, enhance research and limit the spread of covid 19. The academic staff also said digitalisation of instructional processes will improves on teacher-student relationship, ensure effective management of students, reduce time wastage, ease monitoring and evaluation, reduce physical class size and improve on content coverage. This finding tied with that of the ICF Consulting Services Ltd (2015) that carried out a study on the impact of digital technology on learning and teaching. The study was designed to help inform the development of a strategy for digital learning and teaching by providing evidence on how and why digital learning and teaching can benefit learners, teachers and schools. The study was equally aimed at identifying the conditions that lead to its successful implementation and any differences between primary and secondary settings.

A literature search undertaken by collecting nearly 1,000 items from academic, governmental and professional sources to identify evidence of relationships between digital learning and teaching activities and the expected outputs, outcomes and impacts showed that digital equipment, tools and resources where effectively used can raise the speed and depth of learning. Also, the findings showed that the use of digital tools and resources can help to reduce gaps in subject attainment when they are effectively implemented.

Despite the significant effect that digitalisation of instructional processes has on the effectiveness of state Universities, findings also showed that the digitalisation of instructional processes in state Universities is moderate. This could be as a result of barriers faced such as poor internet connection, lack of finance, power failure, inadequate policies, lack of skilled staff, lack of digital tools, lack of knowledge on the use of digital tools, resistance to change, lack of infrastructures and poor decision making. Based on the Cognitive Flexibility theory by Spiro (1980), technology supports the designing of artificial intelligence system and educational technology influence students' learning outcomes. Educational technology specialists do not only see a computer as an electronic device but, a tool that can also be used to facilitate learning. Supporting the instructional environment, with computing technology has brought forward a new way of thinking in relation to instruction and learning, and has also set new goals

and objectives in education. Digitalisation in education has help in simulating teaching and learning processes. In support of this, research has shown that, since 1990s, artificial intelligence through digitalisation in education has helped people understand how to apply educational artificial intelligence effectively in instruction and learning to guide classroom instruction and learning activities (Issroff & Scanlon, 2002). In conclusion, the findings have shown that digitalisation of instructional processes is very beneficial to the University in many angles such as; in management, enhancing effectiveness, and increasing coverage and access).

Recommendations

Based on the findings, it was recommended that;

1. Instructional processes within State Universities should be fully digitalised, for findings have shown that the digitalisation of the instructional processes also facilitates teaching and learning, increases access to education by permitting distance learning, promotes research, eases students' access to information/materials, enables new skills acquisition by students and lecturers, enhances the university's competitiveness, effectiveness and efficiency.
2. It was also recommended that staff and students be trained on the use of digital technologies while good internet connection, steady electricity supply and good policies guiding digitalisation of management processes be put in place.

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