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ASSESSING THE CHALLENGES IN USING DIGITAL TECHNOLOGIES IN TEACHING AND LEARNING IN STATE UNIVERSITIES IN CAMEROON

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Abstract
This study on assessing the challenges in using digital technologies in teaching and learning in state universities in Cameroon had as objective to find out the challenges faculty and students face in the use of digital technologies in teaching and learning in state universities in Cameroon. Four specific research questions guided the study – What challenges do faculty and students face in the use of LMS in state universities in Cameroon? What challenges do faculty and students face in the use of Video Conference Platforms in state universities in Cameroon? What challenges do faculty members face in the use of Microsoft PowerPoint in teaching in state universities in Cameroon? What challenges do faculty and students face in the use of smart devices in state universities in Cameroon? The study based on Rogers' (1962) diffusion of innovation theory, supposing that the adoption of a new idea, behaviour or product does not happen simultaneous in a social system; rather it is a process whereby some people are more apt to adopt the innovation than others and Davis' (1986) technology acceptance model, which posits that the more a technology is perceived as useful and easy to use; its actual usage increases. The researcher adopted a survey design in a qualitative study method. The accessible population consisted of 3666 teachers and final year undergraduate students of eight long existing state universities in Cameroon. Using Kothari and Garg (2014), 406 participants from professional faculties in five of the eight universities were selected to make up the sample size comprising 386 final year undergraduate students and 20 teachers. Stratified purposive sampling and purposive sampling techniques were used in the study. An online Google form alongside an interview guide were adopted as the study instruments. The qualitative data collected were analyzed thematically. The findings of the study showed that Poor internet connection, distractions, and frequent power cuts, were the dominant challenges reported by teachers and students in the use of digital technologies in teaching in state universities in Cameroon. Based on these findings, it was recommended that Government could cause telecommunications companies to improve on their quality of services rendered, as well as reduce the cost of internet. The Government can also diversify energy supply sources to include solar energy in universities Campuses to mitigate the effects of frequent power outages.

Keywords Assessing, Challenges, Digital Technologies, State University.

INTRODUCTION

Using Digital technologies in the context of instruction is expected to support a shift from teacher-centred practices to learner-centred instruction, thereby fostering the acquisition of some 21st century employability skills like creativity, critical thinking and problem solving,

technological literacy, and communication skills, just to name a few (Oben, 2023; Langthaler & Bazafkan, 2020). In distance, online learning, as well as blended learning settings, these digital technologies help widen access to remote populations, especially where lack of resources does not allow for expansion of educational institutions and infrastructure, or to complement the face-to-face teaching and learning process. Langthaler and Bazafkan (2020), referred to the use of digital technology in teaching and learning as an opportunity to improve the quality of education and to offer solutions to long-standing problems such as educational inequalities and restricted access.

Pre-Covid, teaching and learning in Cameroonian universities was dominated by the traditional "brick and mortar only" classroom model which relied heavily on in-person lecture, hard copy educational resources, and little or no use of digital technologies notably, Learning Management Systems, Video conferencing platforms, Microsoft PowerPoint, and Smart devices, just to name these few. Since 2020, most state universities started experimenting with digital technologies in teaching, amidst several challenges. While increasing digitalization has been proven worldwide to enhance academic flexibility, accelerate and deepen skills (Oben, 2023; Endeley, 2018; Chetty et al. 2017, Kornelis and petraka, 2020; Manjusha, 2021;), motivate and engage students, help adapt school to workplace experience (Bughin et al. 2018; Frey & Osborne, 2017; McKinsey Global Institute, 2018; OECD, 2018), thereby enhancing economic viability of graduates, Cameroonian state universities like many other African universities cannot afford to stay behind the technological drive in higher education system.

Given that empirical evidence in Cameroon on the potential benefits (or value-added) of digitalization in education are slim, and considering the high costs involved in creating and running multimedia centres in state universities, the situation is further compounded by the reluctance to change and skills deficiency for both faculty and students, university administrators and policy makers in Cameroon needed assurances that the investment of increasingly scarce CFA francs into digitalization process offers a good return than investing elsewhere. University faculty also needed assurances that digital technologies are easy to use in instruction, are useful for knowledge dissemination and will not increase their workload, while Students on their part needed assurances that their investment in digitalized learning can make their learning easier, while improving their return on education.

The Higher Education law N° 2023/007 of 25 July 2023, instituting the use of digital technologies in teaching, makes governments' resolve to push through with the digital technology enhanced teaching agenda clear, and firm while taking away these apprehensions. In support of this vision, the Head of State Prior to 2020, donated laptop computers to all state university students in the academic year 2016-2017, and dropped customs charges on the importation of ICT material for education for a number of years. This ambition of the state was also clearly stated in the National Development Strategy paper 2020-2030 as the trinomial "Quality assurance, Professionalisation and digitization of teaching, and Employability" outlined in four programmes to be carried out by the Ministry of Higher Education.

Notwithstanding these measures and incentives, teaching with these digital technologies in state universities has not been a smooth ride. Assessing these challenges avails the government as well as the university authorities, the opportunity to adequately address them thereby creating a conducive environment for the use of these digital

technologies in teaching in state universities in Cameroon. This is the focus of this paper, which aims at finding out what challenges faculty and students are facing in the use of digital technologies in teaching in state universities in Cameroon.

Literature Review

Teaching with Digital Technologies

Several definitions exist for teaching: Impedovo (2013) defined teaching as the concerted sharing of knowledge and experience, which is usually organised within a discipline, and, more generally, the provision of stimulus to the psychological and intellectual growth of a person by another person or artefact. Edmund (1967) also defined teaching as "an interactive process, primarily involving classroom talk, which takes place between teacher and students, and occurs during certain definable activities". Teaching is a process in which one individual teaches or instructs another individual. Teaching is considered the act of imparting instructions to the learners in a classroom situation. To teach is to engage students in learning; thus, teaching consists of getting students involved in the active construction of knowledge. In the context of this study, teaching is considered an interactive process that takes place between a teacher and students within a classroom or virtually using digital technologies for the active construction of knowledge.

Digital technologies according to Vuorkari et al. (2016), denote a wide range of technologies, tools, services, and applications using various types of hardware and software. They facilitate services or activities by using electronic means to create, store, process, transmit, and display information. Broadly, digital technologies include the use of personal computers, digital television, radio, mobile phones, and robots (Rice, 2003; Vuorkari et al., 2016).

Teaching with digital technologies, according to Bloomberg (2018), is understood as the innovative use of technological hardware and software in teaching, often referred to as technology-enhanced learning or e-learning. It allows educators to design engaging learning opportunities in the courses they teach, and this can take the form of blended or fully online courses and programmes, giving students some element of control over time, place, path, or pace. According to Manjusha (2021), teaching with digital technologies involves the blending of data, text, and techniques into day-to-day work, such that there is a transformation from the industrial age to the age of technology and creativity. To this author, what is commonly called "digitalization" can take the form of an online application, an online examination, the exchange of online or web knowledge, digital support materials of various formats (ppt, pdf, and doc), social groups, and digital contents and publications. In the context of this study, digital technologies are electronic tools, systems, devices, applications, and resources, both hardware and software, that generate, store, or process data. Considered in this study are Learning Management Systems, Video Conferencing platforms, Microsoft PowerPoint, and Smart Devices.

Learning Management Systems (LMS)

Learning management systems, according to Barreto et al. (2020), are platforms that assist in the delivery of content online for learning purposes. LMS is a web-based software used to facilitate the delivery of online, face-to-face, and blended courses, whether in an academic setting or in the world of business. A learning management system (LMS) is a software application or web-based technology used to plan, implement, and assess a specific learning process. It is used in administration, documentation, tracking, reporting, automation, and delivery of educational courses, training programmes, materials, and

learning and development programmes. The most common LMS used in educational institutions include Moodle, Google Classroom, Blackboard Learning, and Schoology. In the context of this study, Google Classroom and Moodle are considered the LMS tools for teaching in state universities in Cameroon.

Video Conferencing Platforms

Massner (2021) described video conferencing platforms as tools that facilitate online communications for video meetings, audio meetings, and seminars. They mostly have built-in communication features like screen sharing, chat, and recording. In education, video conferencing platforms allow teachers to connect with students no matter where they are. Examples of these platforms are Zoom, Google Meet, Skype, GoToMeeting, Lesson Space, Slack, BlueJeans, and BigBlueButton. For this study, Google Meet and Zoom are considered video conferencing platforms used in teaching in state universities in Cameroon.

Microsoft PowerPoint

Microsoft PowerPoint is simply a presentation-based programme that uses graphics, videos, pictures, and the arts, just to name a few, to make a presentation more interactive and interesting. According to Luke (2021), Microsoft PowerPoint is a slide-based presentation tool that comes as part of Microsoft's Office 365 package. It can be used by teachers and students as a way of creating slideshows. PowerPoint allows users to share the presentations live in the room as well as digitally online via a video conference interface. Students can also work through a presentation in their own time, making this a versatile way to communicate. In this study, Microsoft PowerPoint is considered a slide show presentation programme that uses slides projected on a screen or clean surface to convey rich multimedia information. It accepts the addition of text, images, art, and videos.

Smart Devices

Silverio-Fernández et al. (2018) defined smart devices as interactive electronic gadgets that understand simple commands sent by users and help in daily activities. These devices are generally connected to other devices or networks via different wireless protocols and can operate to some extent interactively and autonomously. Examples of smart devices are mobile phones, tablets, laptops, phablets, smart watches, smart glasses, and other personal electronics. For this study, smart phones and laptops are considered as smart devices used in teaching in state universities in Cameroon.

From a theoretical standpoint, the researcher focused on two theories to support the research work: the theory of diffusion of innovation by Everett Roger (1962) and the Technology Acceptance Model (TAM) by Fred Davis (1986).

Theory of Diffusion of Innovation (DOI)

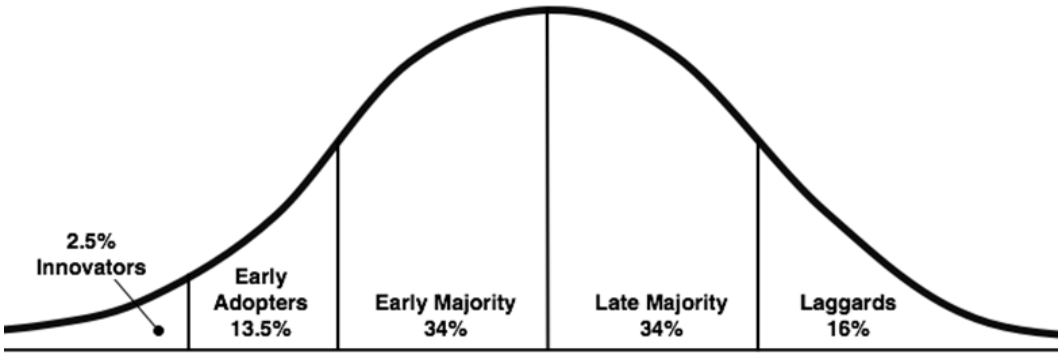
The Diffusion of Innovation (DOI) theory, one of the earliest social science theories, was created by Roger in 1962. The theory describes how a fresh concept or product gathers momentum over time and diffuses or spreads among a particular population. The idea is most suited for looking into how technology is being adopted in the educational system, particularly in higher education institutions. It is a theory detailing how innovations in science, technology, and other fields travel among communities and cultures before being widely accepted. Innovators, early adopters, the early majority, the late majority, and laggards are the primary participants in the idea.

Researchers have discovered that early adopters of innovations differ from those who accept them later in life. Understanding the traits of the target demographic that will facilitate or impede acceptance of the invention is crucial when promoting it to that group. There are five

established adopter categories, and while the majority of the general population tends to fall into the middle categories, it is still necessary to understand the characteristics of the target population. When promoting an innovation, there are different strategies used to appeal to the different adopter categories, as seen in figure 1.

Figure 1:

Diffusion of Innovation Theory



Source : http://blog.leanmonitor.com/early-adopters-allies-launching-product/

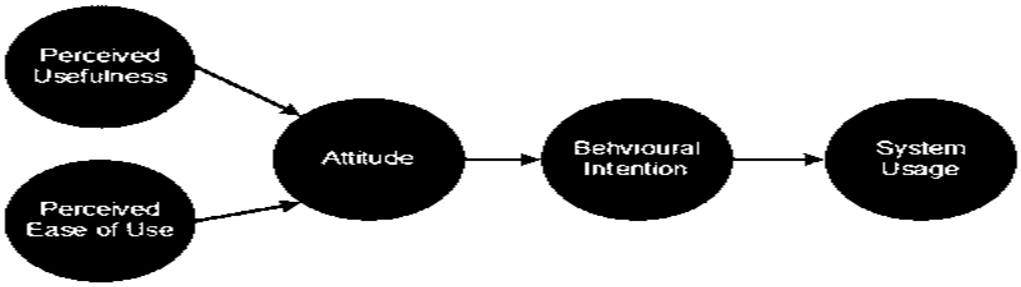
The innovators—those willing to test the innovation—come first. They are bold and curious about novel concepts. They are frequently the first to generate novel ideas and are very eager to take chances. If anything, not much has to be done to appeal to this group. Then follows the group of early adopters, who are thought leaders, value leadership opportunities, and represent opinion leaders. They are usually open to embracing new concepts and mindful of the necessity for change. This group does not require any additional information to persuade them to embrace the innovation, therefore manuals and information sheets on implementation are sufficient to get them started. Next is the early majority. They are the third category. They are rarely leaders in the adoption of new ideas, but they do adopt new ideas before the average person. All they need is evidence that the innovation works and that they are willing to adopt it. Therefore, success stories and evidence of the innovation's effectiveness are all that are needed to get them on board. The late majority is a category of adopters who are typically sceptical of change and will only adopt an innovation after it has been tried by the majority. They require information on how many other people have tried the innovation and adopted it successfully before they too can follow. The last group of adopters are the laggards. This group of people are bound by tradition and very conservative. They are very resistant to change and are the hardest group to bring on board. Strategies to appeal to this group include statistics, fear appeals, and pressure from people in the other adopter groups. According to Rogers, a person's decision to adopt or reject an invention is influenced by a variety of factors, including relative advantage, compatibility, complexity, trialability, and observability. In this study, Roger's diffusion of innovation theory describes the pattern and speed at which university lecturers adopt digital technologies and tools in teaching students in state

universities. As the use of digital technologies in teaching continues to spread among the teaching community in state universities, more and more teachers will adopt innovative teaching methods moving from one stage to another.

Technology Acceptance Model (TAM) by Fred Davis (1986)

This study also stands on the theoretical foundation of the Technology Acceptance Model (TAM) by Fred Davis who designed it to measure the adoption of new technology based on customer attitudes. TAM states that the success of new technology adoption is based on positive attitudes towards two measures: perceived usefulness and perceived ease of use. Its foundations lie further back in time when Ajzen and Fishbein (1980) developed the 'Theory of Reasoned Action', but Davis wanted an easier-to-use model to look at technology at work.

Modified Core Module of T.A.M



Source: www. Smartinsights.com (2022)

Using digital technologies in teaching is an innovation in state universities in Cameroon, and as with every innovation, there are bound to be challenges and even resistance to its use despite its apparent advantages. It is therefore important that the technology be accepted for use by the end users—university faculty and students. To Davis, greater acceptance or adoption of digital technologies in teaching and learning can only be possible when the faculty and students see the technologies as useful and easy to use and change their attitudes towards them by frequently using them. While TAM has been criticised on a number of grounds, it serves in this study as a useful general framework and is consistent with a number of investigations into the factors that influence older adults' intentions to use new technology (Braun, 2013).

Objective of the study

The main objective of this study is to find out what challenges faculty and students are facing in the use of digital technologies in state universities in Cameroon. Specifically, the study sought to:

- Find out what challenges faculty and students face in the use of LMS in teaching in state universities in Cameroon
- Find out what challenges faculty and students face in the use of Video Conferencing platform in teaching in state universities in Cameroon

- Find out what challenges faculty members face in the use of Microsoft PowerPoint in teaching in state universities in Cameroon
- Find out what challenges faculty and students face in the use of smart devices in state universities in Cameroon

Research Questions

The main research question of this study is, what challenges do faculty and students face in the use of digital technologies in teaching in State Universities in Cameroon? Specifically,

- What challenges do faculty and students face in the use of LMS in state universities in Cameroon?
- What challenges do faculty and students face in the use of Video Conference Platforms in state universities in Cameroon?
- What challenges do faculty members face in the use of Microsoft PowerPoint in state universities in Cameroon?
- What challenges do faculty and students face in the use of smart devices in state universities in Cameroon?

METHODOLOGY

According to Kothari and Garg (2014), a research design is the arrangement of conditions for the collection and analysis of data in a manner that aims to combine relevance to the research purpose with economy in procedure. The study followed a survey design with a qualitative method. The study was carried out in five state universities in the cities of Buea, Douala, Dschang, Maroua and Yaoundé. The population of the study was made up of the total number of students and teachers of state universities in Cameroon. Using Kothari and Garg (2014), the researcher selected a sample size of 406 participants from professional faculties, comprising 386 final year undergraduate students, and 20 faculty members who must have taught with digital technologies for at least five years. Stratified purposive sampling was used to select 5 out of 8 long existing state universities, and purposive sampling to select final year undergraduates and faculty members. A questionnaire with open ended questions was used to collect data from final year undergraduate students while an interview guide was used to collect data from faculty members. The administration of the instruments was done by the researcher and two research assistants trained for the purpose. Qualitative data gathered from both the questionnaire and the interview guide was analyzed thematically with the help of quotations and themes.

DISCUSSION

The findings of the study are presented in tabular form and discussed, following the specific research objectives.

Challenges faculty and students face in using Learning Management Systems

Table 1: *Challenges Faculty and Students Face in Using LMS*

	Themes	Quotations
Students	Poor/unstable internet	"Internet problem", "Connection problem", "Problem of connection", "Network issues", " Unstable network", 'Internet issues", 'Poor network at times", 'Slow internet by using MTN sims makes it difficult", 'Poor unstable network in my environment", "Network fluctuations"

	Inadequate teacher interaction	"Lack of interaction with teacher", 'No interaction with the teacher", "Absence de partitions de tout le monde", "Lack of interaction with teacher"
	Distraction	"Distraction". 'Concentration", 'Distraction from home",
	Data	"Data problem", "Learning online need enough mobile data" 'Inadequate finance to often buy data", 'Data and connection subscription".
	Power failure	"Power failure and internet", 'Power failure"
Teachers	Internet connection	"The main challenge I face is internet connection" , "The problem here is that of poor internet connection", "Poor internet connection", 'Sometimes, there is poor internet network", "Internet connection problems", "Poor internet connection", "The network in Buea is not very good plus frequent power outages that make teaching with LMS challenging".
	Lack of computers	"A few students don't have the computer to work on". "Some students do not have laptops".
	lack of interest by few students	"A major challenge I have using Google Classroom are: students' lack of interest", "One of the challenges is that a few students are not comfortable with the technologies"
	Power failure	"Power outages", "As challenge there is the problem of power failure"

Among the students who accepted to the use LMS in teaching, the challenges they face in the use of said digital technology are grouped into five categories and, the frequently mentioned challenge is Poor internet connection, while inadequate/no interaction with teacher, distraction, data and power failure are other challenges reported. Similarly to the students, many of the teachers said they are faced with the problem of poor internet connection when using LMS in teaching as narrated "The main challenge I face is internet connection", "The problem here is that of poor internet connection", "Poor internet connection".. Other problems faced with are that some students do not have computers, lack of interest by few students and power failure.

Challenges Faculty and Study Face in Using Video Conferencing Platforms

Table 2: *Challenges Faced Using Video Conferencing Platforms*

	Themes	**Quotations**
Students	Poor/unstable internet	"Poor internet", "Problem of connection", "Internet problem", 'Network issues", "Poor internet connection" "Unstable network", 'Internet issues", 'Problem of connection", 'Connection problems", 'Poor connection network", 'Internet challenge", 'Internet facility", 'Network fluctuations".
	Distraction	"Distraction", 'Home distractions".
	Data	"Data connection", 'Lack of data", 'Data connection problem", "Uses more data"

	Power failure	"Power failure", "Frequent power failure".
	Poor video quality	"Poor video quality"
	Organisation	"Poor scheduling of tasks".
Teachers	Internet connection	"The main challenge is poor network connection", "Poor internet connection", "Internet connections", "Poor internet connection", "A major difficulty is the problem of network failures", "Poor internet connection", "The main challenge I face is that most students don't get to follow the lessons till the end for poor connections", "Poor network is a major challenge".
	Data	"The main challenge I face is that most students don't get to follow the lessons till the end for poor connections or lack of data, "Students inability to connect due to lack of data", "Lack of data"
	Evaluation difficulties	"It is difficult to evaluate the students on the platform"
	Lack of good devices	"Students inability to connect due to lack of good device", "Sometimes students don't have adapted gadgets that support video conferencing"
	Students' digital illiteracy	"The inability of some students to use the tools"

From these findings, among the students who accepted to the use video conferencing in teaching, the challenges they face were grouped into six categories and, the frequently mentioned challenge was poor internet while, distraction, data, poor video quality, power failure and organization of tasks are other challenges reported. Similarly to the students, many of the teachers indicated that poor internet connection is the dominant challenge they are faced with when using video conferencing platforms in teaching as narrated "The main challenge is poor network connection", "Poor internet connection", "Internet connections". The lack of data, difficulty in carrying out evaluation using video conferencing, digital illiteracy of some students and the lack of good devices by some students are other challenges reported by teachers.

Challenges Faculty Members Face in Using Microsoft PowerPoint in Teaching

Table 3: Challenges Faced Using Microsoft PowerPoint in Teaching

Themes	Quotations
Power failure	"Power failure which unfortunately is more frequent now", "We have a lot of disruptions in energy supply that make the classes to sometimes end before time or not even hold", "Frequent Power failure", "Frequent power outages disrupts my lessons", "Power failure is regular in Douala and so the equipment cannot function", "There is the problem frequent power cuts", 'The frequent power cuts are a challenge to teaching with PowerPoint", 'Irregular energy supply is a challenge", "Frequent

	power cuts that interrupt and end the lecture", "The frequent power cut in Buea is the main challenge I have teaching with PowerPoint".
Unsupportive school infrastructures	"Most lecture halls are not equipped with overhead projectors and the necessary electrical connections to support teaching with the tool"

Based on challenges faced by teachers in using Microsoft PowerPoint in teaching, many of them complain of frequent power failure as narrated "We have a lot of disruptions in energy supply that make the classes to sometimes end before time or not even hold", "Frequent Power failure", "Frequent power outages disrupts my lessons", "Power failure is regular in Douala and so the equipment cannot function". The other challenge recorded was unsupportive school infrastructure as depicted in the following: "Most lecture halls are not equipped with overhead projectors and the necessary electrical connections to support teaching with the tool"

Challenges Faculty and Students Face using Smart Devices

Table 4: *Challenges Faculty and Students Face using Smart Devices*

	Themes	Quotations
Students	Distraction	"Problem of concentration", 'Distraction", 'Lack of concentration", 'Concentration problem", 'I am tempted to be distracted", 'Easily get distracted by social media". 'La distraction", 'Distract a lot", 'Psychological distractions", 'Distractions from recurrent pop-ups", 'Distracting yet useful', "It distract, La distraction facile", 'La distraction quotidienne", 'Beaucoup de distractions par les".
	Power failure	"Power outage", 'Electricity failure", "Lack of electricity to charge laptop", "Power supply", 'Unstable electricity", 'Absence of power supply in most classes", 'Lack of power supply in the classrooms".
	Poor/unstable internet	"Poor network", 'Manque de connexion", "Network", 'Connection problem", 'Disruption by internet connection','Poor network".
	Teacher interaction	"Lack of interaction with the teacher", "Lack of interaction with the teacher", 'Interactivity".
	Cost	"High cost of gadget", 'Financial costs".
	Data	'I don't always have money to buy Data".
Teachers	Students' distraction	"Lack of concentration from the students, plagiarism is common place", 'The main challenge I have is to manage distraction from students who are on social media while in class", 'Distractions in class", "Lack of concentration from the students", "The main challenge in using smart devices is the issue of distraction, as students sometime have divided attention: on the lesson and on social media", 'The main challenge I have is getting students attentive in class and not to be on WhatsApp and Facebook during class", "The main challenge is to manage the distraction that these tools bring to class", "The main challenge in using smart devices is the issue of distraction, as students sometime have divided attention: on the lesson and on social media","Student's abusive use of the devices in class e.g. social media chats during lectures", "A real problem with these devices especially the smart phone is disruption", "The challenge resides in managing disruptions from the wrong use of the devices e.g. chatting on WhatsApp during the class", "The main challenge in using smart devices is the issue of distraction,

	as students sometime have divided attention: on the lesson and on social media".
Plagiarism by students	"Cheating in examination is common and copy work from internet sources", "Copy work is more from internet sources", 'Plagiarism".
Cheating in examinations	"The devices favour cheating in examinations", "The main challenge is to manage cheating"
Laziness by students	"This device may make students lazy as they copy from internet sources".

From these findings, most of the students accepted that they used smart devices in learning. Grouping their challenges into six categories, the frequently mentioned challenge was distraction, followed by power failure and poor/unstable internet. Limited interaction with teachers, cost of gadgets and data were other challenges reported.

Based on challenges reported by teachers in using smart devices in teaching, many of them like the students themselves complained of distraction as depicted in the statements: Distractions in class", "Lack of concentration from the students", "The main challenge in using smart devices is the issue of distraction, as students sometime have divided attention: on the lesson and on social media"., 'The main challenge I have is getting students attentive in class and not to be on WhatsApp and Facebook during class", "The main challenge is to manage the distraction that these tools bring to class". Plagiarism by students (coping work from other sources), cheating in examination and laziness by some students are other challenges mentioned.

CONCLUSION

The findings of the study culminated in the conclusion that Poor internet connection, distractions, frequent power cuts, and unsupportive classrooms are the dominant challenges reported by teachers and students in the use of digital technologies in teaching in state universities in Cameroon.

RECOMMENDATION

From the findings of the study, it was recommended that Government could do the following: cause telecommunications companies to improve on their quality of services rendered as well as reduce the cost of internet. Government could diversify energy supply sources to include solar energy in universities Campuses to mitigate the effects of frequent power outages. University authorities can regularly organize training sessions for teachers and students on how to use digital technologies in the context of education. University authorities can ensure that lectures halls are equipped with overhead projectors to facilitate teaching with these digital technologies.

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