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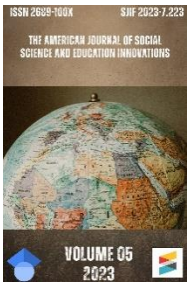

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Research Article

ADOPTING SMART DEVICES IN TEACHING FOR THE ACQUISITION OF 21ST CENTURY EMPLOYABILITY SKILLS BY STUDENTS IN STATE UNIVERSITIES IN CAMEROON

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ABSTRACT

This study on adopting smart devices in teaching for the acquisition of 21st century employability skills by students in State Universities in Cameroon had as objective to find out the extent to which the use of smart devices in teaching can enhance the acquisition of 21st-century employability skills by students in state universities in Cameroon. Two research questions guided the study: - To what extent is the use of smart phones in teaching effective in enhancing the acquisition of 21st-century employability skills by students in State Universities in Cameroon? To what extent is the use of Laptops in teaching effective in enhancing the acquisition of 21st-century employability skills by students in State Universities in Cameroon? It was hypothesized that the use of smart devices in teaching does not significantly enhance students' acquisition of 21st-century employability skills 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 simultaneously 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 study adopted an exploratory sequential research design in a mixed-methods study. The accessible population consisted of 3666 teachers and final-year undergraduate students of eight state universities in Cameroon. Using Krejcie & Morgan (1970), 406 participants from professional faculties in five of the eight long existing state universities in Cameroon, were selected to make up the sample size,

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comprising 386 final-year undergraduate students, and 20 teachers. The stratified purposive sampling, and purposive sampling techniques were adopted for the study. Online Google forms alongside a paper questionnaire, and an interview guide were adopted as the study instruments. The quantitative data were analysed using SPSS version 25 with the aid of descriptive and inferential statistics. The Spearman rho test was used to test the hypotheses and Analysis of Variance (ANOVA) was used for regression analysis. The qualitative data were analysed thematically. The findings of the study showed that the use of smart phones and laptops in teaching had a significant, moderate, and positive impact on students' acquisition of 21st-century employability skills (r- value = 0.418**, p-value 0.000< 0.05) in state universities in Cameroon. In conclusion, the findings of the study showed that smart devices do not only help students in information sourcing but enhanced their communication skills, critical thinking & problem solving skills, creativity and team working skills. Based on the findings of the study, it was recommended that the state should make teaching with smart devices a policy in state universities and university teachers should be encouraged to use of smart Phones and Laptops in teaching to enhance students' acquisition of 21st century employability. It was also recommended that government should take appropriates measure to resolve the energy crisis, internet disruptions and training challenges both teachers and students are currently facing.

KEYWORDS

Smart Devices, Teaching, 21st Century, Employability Skills, Cameroon.

INTRODUCTION

Although Smart devices have been around just for like four decades, the rapid development in education applications on these devices, their affordance and heavy presence in classrooms, plus the enormous advantages like enhancing academic flexibility, motivate and engage students, accelerate and deepen students' skills, have militated for their effective use in teaching and learning (Bughin et al. 2018; Frey & Osborne, 2017; Oksana, Valentina, Irina, & Denis, 2021; McKinsey Global Institute, 2018). For among the many expectations of students upon graduation is getting a good job, and this is determined by their level of preparedness for future work through the pursuit of an organised education that takes account of the demands of the future job market. It is often said that hard skills (subject / technical knowledge) exhibited in paper certificates bring graduates to the doorsteps of opportunities, but it is the soft skills (employability skills) that open the doors to these opportunities.

Unfortunately, it is observed that most students from state universities in Cameroon usually end up as mere degree holders upon graduation, lacking essential 21st-century employability skills. Possible evidence can be found in their deficiency in communication skills (oral and written), inability to think outside the box, lack of creativity, and poor collaborative skills. One factor that may account for this could be the limited use of smart devices in teaching. Perhaps an increased enthusiasm on the part of university lecturers for the appropriation and sustained use of smart devices in instruction could enhance the acquisition of these 21st-century skills by students in state universities in Cameroon. Literature indicates that empirical studies carried out in sub-Saharan Africa, and especially Cameroon, relating the use of smart devices in teaching to enhance the acquisition of 21st-century employability skills are very slim.

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With growing evidence in literature that the use of smart devices in teaching exposes university students to these 21st-century employability skills, since 1990, there have been many reports and papers urging the higher education sector to take key, core, transferable, and employability skills into the heart of students' learning experiences, especially as employers today place the greatest importance on employees' attitudes and basic skills over job-specific skills and having an understanding of the work environment (Ab-Rahim et al., 2013; McKnight et al., 2001; Smith et al., 2000;). This is probably one of the reasons why governments all over the world are making efforts to push the technology-assisted teaching agenda through and to further align schooling with the requirements of the labour market (Pasker 2019). Perhaps this is also what led the Ministry of Higher Education in Cameroon to align its strategic development paper NDS30 with the 2030 Agenda for sustainable development goals (SDG) 4 and 8, wherein emphasis is laid on the need for state universities to embark on the triple objective of "quality assurance, professionalisation and teaching with digital technologies, and employability"(Cameroon, 2020). This is the focus of this study as it attempts to answer the question: "To what extent is the use of smart devices in teaching effective in enhancing the acquisition of 21st-century employability skills by students in State Universities in Cameroon?"

LITERATURE REVIEW

Teaching with Smart Devices

Teaching according to Impedovo (2013) is 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) defined teaching as "an interactive process, primarily involving classroom talk, which takes place between teacher and pupil and occurs during certain definable activities". 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.

In order to suit the demands of both students and teachers as they attempt to integrate the newest technology into classrooms, institutions have been modifying their educational systems as well (White & Manton, 2011). Smart devices have become a ubiquitous part of our everyday lives, forming our habits. For instance, mobile devices have been extensively used at all levels of the educational system for a variety of purposes (Hunsinger et al., 2008), enabling students to communicate with their peers and teachers and access course materials whenever and wherever they want (Kukulska-Hulme & Shield, 2008; Nihalani & Mayrath, 2010). The combination of these smart devices, social media, and especially free web tools does not only support interaction between students and their instructor but also enhances the teaching-learning process (Rodriguez, 2011) and the acquisition of 21st century skills by learners.

Smart devices are interactive electronic gadgets that support daily activities and comprehend simple human directions. A smart device is an electronic device that can operate to some level interactively and autonomously and is typically connected to other devices or networks by various wireless protocols, including Bluetooth, Zigbee, NFC, Wi-Fi, LiFi, and 5G. Smart phones, laptops, tablets, smart watches, smart glasses, and other personal electronics are some of the most popular smart devices, but for purposes of this

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study, only smart phones, tablets and laptops were considered (Silverio-Fernández et al., 2018).

21st Century Employability Skills Acquired Through Teaching with Smart Devices.

There are many 21st century employability skills that can be acquired by students as a result of teaching with smart devices. The present study considered four: Communication, critical thinking, Collaboration, and creativity.

According to Marissa (2020), communication skills refer to students being able to organise their thoughts, data, and findings and share them effectively through a variety of media, as well as orally and in writing. Oral and written communication skills are very important in today's technological age, where sending a quick text to your friends or family may not include proper grammar, which in turn can result in a sharp decline in your written or oral communication skills. Most often, before an employer sees your curriculum vitae or makes an evaluation of your portfolio, he or she has already made an impression of you, positive or negative, on account of your oral or written communication skills. This impression, most of the time, counts more than the class of your degree. Therefore, keeping a check on your oral and written communication skills is more or less like keeping a gate open to your employability potential. This skill is learnt, and university students must be keen on excelling in it as it tells your whole story in just a jiffy. Smart devices are excellent communication channels, when used in teaching, they serve to improve student-student, student-teacher, and teacher-student group interactions, giving each student the opportunity to have a say and to present their opinions and ideas in a logical, respectful, and acceptable manner on topics of discussion. Students taught with these devices are likely to have more acceptable oral and written communication skills than their peers who have not been taught with them (Marissa, 2020).

Critical thinking skills refer to students being able to analyse complex problems, investigate questions for which there are no clear-cut answers, evaluate different points of view or sources of information, and draw appropriate conclusions based on evidence and reasoning. Henderson (2020) posits that the use of ICT in education adds value to teaching and learning by enhancing the effectiveness of learning, helping students think independently and communicate creatively. According to Kunzler (2011), using the cameras to shoot video, instructional videos or "show your understanding" videos can be created on your mobile device by students, inciting creative thinking in their minds.

Collaboration skills refer to students being able to work together to solve problems or answer questions, to work effectively and respectfully in teams to accomplish a common goal, and to assume shared responsibility for completing a task. Teamwork is necessary for jobs across the spectrum. From construction work to marketing, nursing to acting, teamwork and collaboration are vital to keeping the organisation or company running smoothly. By interacting and collaborating with their peers, each bringing a different skill set to the table, they achieve more in terms of growth and success. Students reach a better conclusion or idea than they would have had individually (Windschitl, 2002).

Creativity skills refer to students being able to generate and refine solutions to complex problems or tasks based on synthesis and analysis and then combine or present what they have learned in new and original ways. With the many different sources of information and solutions available on smart devices connected to the internet, students can easily synthesize, analyze

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and present what they have learnt in new and original ways (Marissa, 2020).

More skills that employers seek in the candidates they hire are technology literacy, Professionalism and ethics, leadership skills, flexibility, life skills, motivation, organisation, ability to learn new skills, just to name a few.

Teachers' Perception on the Use of Smart Devices in Teaching

In the last few decades, many schools across the world banned their students from using smart devices in classroom because they caused distraction in lecture halls, but today, using smart devices in the classroom is extremely popular as an indispensable learning assistant tool. In the era of digital education, smart phones, tablets, or laptops would expectedly replace physical books and study documents inside schools. During the pandemic crisis, schools had to shut down physical classes to pursue virtual classroom apps. The use of smart phones in education became more apparent as it supported this kind of learning. According to Prescott and Oduyemi (2003), teachers can manage their classes by using their smart devices to upload course materials via learning management systems (LMS), place assignments and projects, track students' progress, respond to student complaints and comments, post announcements, launch discussion groups, and carry out any other tasks of a similar nature. Teachers may improve their lesson plans, engage more students, and support customised learning by properly utilising these technologies in the classroom. The instructional activities that students engage in are greatly influenced by smart devices. Students can register for classes, check class and examination schedules, check grades, participate in group discussions, read announcements and pay tuition using their smart phones, among many other things. (Nouri, 2017; Roschelle & Pea, 2002).

According to Nouri (2017), given that nearly all students now possess and use smart devices, the first benefit of using these smart gadgets in education is that it makes keeping track of homework easier. Verification of information from different sources incites critical thinking. Without a doubt, smart devices are a gateway to information, and, if used appropriately, they have the potential to enhance students' learning and the acquisition of the much-needed 21st century skills of critical thinking, creativity, collaboration, and communication (Nouri, 2017; Prescott & Oduyemi, 2003; Roschelle & Pea, 2002; Soloway et al., 2001). Marc (2001) pointed out that; today, mobile learning is a need and not a want. Students have not just changed incrementally when compared to those of the past. They are the first generation to grow up with electronic devices and new technologies. Many teachers believe that by allowing students to use smart devices in the classroom, their motivation to learn and achieve is likely to increase (Kunzler, 2011).

Through knowledge transmission, research and innovation, state universities in Cameroon aim to equip their students with the skills needed to meet the ever changing labour market requirements. With employability concerns ranking top most priority, and available literature attesting to the positive impacts of using smart devices in teaching to enhance students acquisition of these much needed 21st century skills, it is incumbent on university teaching staff to take advantage of the availability and relative affordance of smart devices to improve on teaching for the acquisition of these skills. It is in view of this that Utulu and Ayodele (2012) posited that teaching with the mobile phone can strengthen the capacity of students

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and help them imbibe flexible learning, collaborative learning, and social networking skills that are important in the information society today. Their findings were later corroborated by Twum (2017) when he found out that the mobile phone had great potential as a learning tool and could be positively used for teaching and learning purposes, recommending that students should be aware of and take an interest in using smart phones to support their learning experiences. In the same way Zakaria, Fordjour, and Afriyie (2015) suggested that students should effectively use mobile phones for academic purposes such as storage and retrieval of e-books, taking of lecture notes, taking online evaluations, and submission of assignments. Hannelie and Walter (2014) on their part found out that Mobile phones can be considered an enabling technology in supporting teaching and learning, stressing that mobile phone application can be used successfully to support teaching and learning.

Objectives of the study

The main objective of this study is to find out the extent to which the use of smart devices in teaching can enhance the acquisition of 21st-century employability skills by students in state universities in Cameroon. Specifically the study sought to:

- Find out the extent to which the use of smart phones in teaching can enhance the acquisition of 21st century employability skills by students in state universities in Cameroon
- Find out the extent to which the use of laptops in teaching can enhance the acquisition of 21st century employability skills by students in state universities in Cameroon

RESEARCH QUESTIONS

The main research question of this study is, to what extent is the use of smart devices in teaching effective in enhancing the acquisition of 21st-century employability skills by students in State Universities in Cameroon? Specifically, two questions guided the study:

- To what extent does the use of smart phones in teaching effective in enhancing the acquisition of 21st-century employability skills by students in state universities in Cameroon?
- To what extent does the use of Laptops in teaching effective in enhancing the acquisition of 21st-century employability skills by students in state universities in Cameroon?

Hypotheses

Ho: The use of smart devices in teaching does not significantly enhance students' acquisition of 21st-century employability skills in state universities in Cameroon.

H1: The use of smart devices in teaching significantly enhances students' acquisition of 21st-century employability skills in state universities in Cameroon.

RESEARCH METHODOLOGY

The research design adopted for this study was the exploratory sequential research design in a mixed study. The study area was 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 krejcie and Morgan (1970) the researcher selected a sample size of 406 participants from professional faculties in five of the eight long

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existing state universities in Cameroon, comprising 386 final year undergraduate students, and 20 teachers who must have taught with smart devices 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 teachers. A four-point Likert scale - strongly Agree(SA), Agree(A), Disagree (D) and strongly Disagree (SD), where SA=4, A=3, D=2 and SD=1, questionnaire - both online and paper format (with positively cued statements) was used to collect data from final year undergraduate students, while an interview guide was used to get data from teachers. The administration of the instruments whose face, content and construct validity were established by the University of Buea scientific team were personally carried out by the researcher. The Cronbach coefficient for student questionnaire was established at 0.865.

Qualitative data from the study was analysed thematically while the quantitative data were first processed using EPiData 3.1 then exported to SPSS version 25, then regression analysis were conducted for the questionnaires.

FINDINGS AND DISCUSSION

The findings of the study will be presented, discussed and supported by relevant literature. Quantitative data will be presented first followed by qualitative data.

The use of Smart Phones in Teaching and the Acquisition of 21st Century Employability Skills

Data for this section were collected from final year undergraduate students using a questionnaire and an interview guide for teachers. The data from students will be presented first then the qualitative data.

Students' Appreciation of the use of Smart Phones in Teaching

Students' opinions on whether smart phones were used in pedagogical activities and their appreciation of the skills acquired as a result of the use of smart phones in teaching were summarised in table N° 3.

Table 3

Students' Appreciation of the use of Smart Phones in Teaching

Statements	Stretched				Collapsed	
	SA	A	D	SD	SA/A	D/SD
Teachers in my department use Smart phones in teaching.	225 (58.3%)	126 (32.6%)	23 (6.0%)	12 (3.1%)	351 (90.9%)	35 (9.1%)
Teachers assess assignments using smart phones.	69 (17.9%)	149 (38.9%)	139 (36.0%)	29 (7.5%)	218 (56.5%)	168 (43.5%)
Teachers give feedback using smart phones	115 (29.8%)	187 (48.4%)	72 (18.7%)	12 (3.1%)	302 (78.2%)	84 (21.8%)
I use my smart phone to participate in group work	161 (41.7%)	165 (42.7%)	47 (12.2%)	13 (3.4%)	326 (84.5%)	60 (15.5%)

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I use my smart phone connected to the internet to access a variety of information sources	233 (60.4%)	105 (27.2%)	34 (8.8%)	14 (3.6%)	338 (87.6%)	48 (12.4%)
I will recommend the use of smart phones for all my courses	113 (29.3%)	151 (39.1%)	103 (26.7%)	19 (4.9%)	264 (68.4%)	122 (31.6%)
Smart phones in classroom are distractive e.g. students use them for social media chats during lectures	161 (41.7%)	141 (36.5%)	61 (15.8%)	23 (6.0%)	302 (78.2%)	84 (21.8%)
Through increased access to a variety of information sources thanks to the use of smart phones, my ability to construct knowledge of my own has been sharpened.	187 (48.4%)	171 (44.3%)	25 (6.5%)	3 (0.8%)	358 (92.7%)	28 (7.3%)
Learning in small groups using my smart phone has enabled me develop cooperative skills.	154 (39.9%)	172 (44.6%)	53 (13.7%)	7 (1.8%)	326 (84.5%)	60 (15.5%)
The use of my smart phone in learning enables me convey messages clearly and concisely	168 (43.5%)	157 (40.7%)	49 (12.7%)	12 (3.1%)	325 (84.2%)	61 (15.8%)
Learning with smart phones help me imbibe problem-solving skills	182 (47.2%)	159 (41.2%)	39 (10.1%)	6 (1.6%)	341 (88.3%)	45 (11.7%)
Multiple Responses Set (MRS)	**1768 (41.6%)**	**1683 (36.6%)**	**645 (15.2%)**	**150 (3.5%)**	**2750 (81.2%)**	**366 (18.8%)**

With reference to smart phones, 90.9% (351 students) indicated that teachers in their department use smart phones in teaching. At an individual level, 87.6% (338) of students indicated that they use smart phones connected to the internet to access a variety of information sources. Similarly, still at an individual level, 84.5% (338) of students indicated they used smart phones to participate in group work. 78.2% (302) of students indicated that smart phones in the classroom are distractive, for example, students use them for social media chats during lectures. With reference to giving tests, 47.7% (184) of students indicated that their teachers gave tests using smart phones, and 56.5% (218) also indicated that their teachers assessed assignments using smart phones. 78.2% (302) of students opined that teachers gave feedback using smart devices. Finally, 68.4% (264) of students indicated that they would recommend the use of smart devices for all their courses.

Based on students' appraisal of the use of smart phones in teaching to enhance the acquisition of 21st century employability skills, 92.7% (358) of them indicated that their ability to construct knowledge of their own (creativity) had been sharpened through increased access to a variety of information sources by

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smart phones. 88.3% (341) of students also indicated that they were capable of generating personal solutions to complex problems due to variety of information access using smart devices (critical thinking enhanced). Furthermore, 84.5% (326) of students indicated that learning in small groups using smart phones enabled them develop cooperative skills. Finally, 84.2% (325) of students opined that the use of smart phones in learning enabled them convey messages clearly and concisely (communication).

In aggregate, 81.2% of students agreed to have acquired some 21st century employability skills as a result of learning with smart phones and this finding corroborates studies carried out by Prescott and Oduyemi, Twum (2017), and Nouri, (2017). To Prescott and Oduyemi the opportunity to access a variety of information sources using smart devices connected to the internet enables students to imbibe flexible learning, collaborative learning, and social networking skills. Nouri posits that verification of information from different sources using smart phones incites critical thinking. It is also important to recall that the use of smart devices in teaching intervenes within the paradigm shift from the teacher-centred to the learner-centred practise, and just like every other innovation, the acceptance and use of smart phones and laptops in teaching should not be without challenges. But the affordance and near omnipresence of smart phones and laptops in classrooms, initially intended for use mostly for other communicative and business purposes, is an opportunity for the education community to use them in the context of instruction, given the many advantages they bring to knowledge construction and dissemination. And as Roger (1962) puts it in his theory of the diffusion of innovation, not everyone will embrace these technologies at the same time; therefore, there will always be the innovators and the laggards

Roger posits that the adoption of a new idea, behaviour, or product does not happen simultaneously in a social system; rather, it is a process whereby some people are more apt to adopt the innovation than others. Some will be innovators, early adopters, early majority, late majority, and laggards. To him, the stages by which a person adopts an innovation and whereby diffusion is accomplished include: awareness of the need for the innovation, decision to adopt (or reject) the innovation, initial use of the innovation to test it, and continued use of the innovation. The findings of this study show that smart phones and laptops can be trusted for use in teaching despite the challenges reported, and teachers and students can spread the good news of their usefulness to sceptics. As many students get to move from one stage of adoption to another, the rate of distraction will be greatly reduced just like the other challenges, and the acquisition of 21st century employability skills will be enhanced.

Teachers' Appreciation of the use of Smart phones in Teaching for the Acquisition of 21st Century Employability Skills by Students

Table 6:

Teachers' Opinion on the Use of Smart Phones in Teaching

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	Themes	Quotations
Use of Smart phones	Frequently used by teachers	"They occupy a priority position in my teaching" ""I used them in teaching all my courses". "Smart phones are very important for my teaching. I use the smart phone every time in my teaching"
	High usage by students	"Very important place because my students and I use them all the time" "A very important place in my teaching"
Appreciation of the use of smart phones	Information sourcing	"The students are glued to this gadgets for all forms of information and they master how to go about information search from different sites" "My students master how to use the smart phone to search for information on internet sites so as to complete their assignments" "They master how to go about information search from different sites".
	Enhance communication skills	The tools facilitate communication for example the smart phone checks spelling, corrects grammar etc. helping the student improve in language" 'Smart phones are excellent tools for development of communication skills. "Smart phones facilitate all forms of communication - audio-visual and these tools help in the development of skills in the students.
	Enhance class interaction / collaboration	"The tools also facilitate interaction: teacher – student & student – student, and group work is made easy". "Thanks to the mobile phone and its applications like SMS, WhatsApp and other social media platforms, student interaction and working as a team is made easier, even teacher –student interaction is facilitated". "Class interaction is at its best with the help of smart phones. Even students who do not make it to class are up to date with the help of these devices. Teacher –student and student- student collaboration is very good" "I put my students in pairs to work and present their findings on most topics and this plays positively on their class interaction and collaboration thanks to the use of these tools"
	Enhance critical thinking	"Thanks to the variety of information sources that the smart phones make available to the students, they can easily get inspiration from them to generate their own ideas".
	Creativity	"Smart devices provide students with a variety of sources of information from which they can copy good ideas from and imitate to generate their own solutions to problems" "The volume of information that these tools bring to the student via their different applications are a source of inspiration for the students to imitate and develop their own solutions to problems".

Based on teachers' opinion on smart phones used in teaching, many of them said they frequently used smart phones in teaching as depicted in the following statements: "They occupy a priority position in my teaching" ""I used them in teaching all my courses". "Smart phones are very important for my teaching. I use the smart phone every time in my teaching" Based on teachers' appreciation of the use of smart phones in

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teaching, many of them said it helps students in sourcing for information, as depicted in the following statements The students are glued to this gadgets for all forms of information and they master how to go about information search from different sites" "My students master how to use the smart phone to search for information on internet sites so as to complete their assignments"

Many of the teachers said that it enhances students' communication skills, as depicted in the following statements: "The tools facilitate communication for example the smart phone checks spelling, corrects grammar etc. helping the student improve in language" 'Smart phones are excellent tools for development of communication skills. "Smart phones facilitate all forms of communication - audio-visual and these tools help in the development of skills in the students."

Many of the teachers also added that the use of smart phones in teaching enhances class interaction and collaboration among students, as depicted in the following statements: "Class interaction is at its best with the help of smart phones. Teacher –student and student- student collaboration is very good" "I put my students in pairs to work and present their findings on most topics and this plays positively on their class interaction and collaboration thanks to the use of these tools". Again, many of the teachers said it enhances critical thinking in students, as reflected in the following statements "Thanks to the variety of information sources that the tools make available to the students, they can easily get inspiration from them to generate their own ideas",

Finally, many of the teachers also said that the use of smart phones in teaching enhances students' creativity due to the ability of students to copy, imitate and gain inspiration from information gathered from different sources as depicted in the following statements: "Smart phones provide students with a variety of sources of information from which they can copy good ideas from and imitate to generate their own solutions to problems" "The volume of information that these tools bring to the student via their different applications are a source of inspiration for the students to imitate and develop their own solutions to problems".

The use of Laptops in Teaching and the Acquisition of 21st Century Employability Skills

Data for this section were collected from final year undergraduate students using a questionnaire and an interview guide for teachers. The data from students will be presented first then the qualitative data.

Students' Appreciation of the use of Laptops in Teaching

Students' opinions on whether laptops were used in pedagogical activities and their appreciation of the skills acquired as a result of the use of laptops in teaching were summarised in table N° 4.

Table 4

Students' Appreciation of the use of Laptops in Teaching

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Statements	Stretched				Collapsed	
	SA	A	D	SD	SA/A	D/SD
Teachers in my department teachers use laptops in teaching.	200 (50.0%)	126 (32.6%)	23 (6.0%)	37 (9.25%)	326 81.5%)	60 (18.5%)
In my department teachers give tests using laptops.	42 (10.9%)	142 (36.8%)	143 (37.0%)	59 (15.3%)	184 (47.7%)	202 (52.3%)
Teachers assess assignments using laptops.	169 (42.25%)	149 (38.9%)	39 (9.75%)	29 (7.5%)	218 (81.15%)	68 (18.85%)
Teachers give feedback using laptops	100 (25.0%)	190 (47.5%)	72 (18.7%)	38 (9.5%)	290 (72.5%)	110 (27.5%)
I use my laptop connected to the internet to access a variety of information sources	243 (60.7%)	125 (31.25%)	14 (2.85%)	14 (2.85%)	368 (92.0%)	32 (8.0%)
I use my laptop to participate in group work	165 (42.7%)	161 (41.7%)	13 (3.4%)	47 (12.2%)	326 (84.5%)	60 (15.5%)
I will recommend the use of laptops in teaching for all my courses	151 (39.1%)	113 (29.3%)	103 (26.7%)	19 (4.9%)	264 (68.4%)	122 (31.6%)
Through increased access to a variety of information sources thanks to the use of laptops in learning, my ability to construct knowledge of my own has been sharpened.	185 (46.25%)	187 (46.75%)	25 (6.25%)	3 (0.75%)	372 (93.0%)	28 (7.0%)
Learning in small groups using the laptop has enabled me develop cooperative skills.	164 (41.0%)	192 (48.0%)	37 (9,25%)	7 (1.8%)	356 (89.0%)	44 (11,0%)
The use of laptops in learning enables me convey messages clearly and concisely	168 (43.5%)	171 (42.75%)	49 (12.7%)	12 (3.1%)	345 (86.25%)	55 (13.75%)
Learning with laptops help me imbibe problem-solving skills	202 (50.5%)	159 (39,75%)	19 (4.75%)	20 (5.0%)	361 (90.25%)	39 (9,75%)
Multiple Responses Set (MRS)	**1789 (41.1%)**	**1825 (39.6%)**	**1523 (12.5%)**	**209 (6.8%)**	**3635 (80.7%)**	**997 (19.3%)**

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With reference to the use of laptops in teaching, 81, 5% (326 students) indicated that teachers in their department use laptops in teaching. At an individual level, 92% (368) of students indicated that they use their laptops connected to the internet to access a variety of information sources. Similarly, still at an individual level, 84.5% (338) of students indicated they used laptops to participate in group work. With reference to giving tests, 47.7% (184) of students indicated that their teachers gave tests using laptops, and 81, 15% also indicated that their teachers assessed assignments using laptops. 72.5% (290) of students opined that teachers gave feedback using laptops. Finally, 68.4% (264) of students indicated that they would recommend the use of laptops for all their courses.

With reference to students' appraisal of the use of laptops in teaching to enhance the acquisition of 21st century employability skills, 93.% (372) of them indicated that their ability to construct knowledge of their own (creativity) had been sharpened through increased access to a variety of information sources by laptops. 90, 25% (361) of students also indicated that they were capable of generating personal solutions to complex problems due to variety of information access using laptops (critical thinking enhanced). Furthermore, 89% (356) of students indicated that learning in small groups using laptops enabled them develop cooperative skills. Finally, 86.25% (345) of students opined that the use of laptops in learning enabled them convey messages clearly and concisely (communication).

In aggregate, the findings showed that 80.7% of students agreed that laptops are used in pedagogical activities in their departments and this enabled them to acquire some 21st century employability skills. These findings align with those of previous studies by Utulu and Ayodele who suggested that project based learning (PBL) can imbibe flexible learning, collaborative learning, and social networking skills in students; although their study findings did not confirm this hypothesis. Rodriguez, (2011) also posited that the combination of these smart devices, social media, and especially free web tools does not only support interaction between students and their instructor but also enhances the teaching-learning process and the acquisition of 21st century skills.

The findings of the present study, just like the majority of previous studies that corroborate them, stand on the theoretical foundations of Davis' (1986) technology acceptance model, which posits that the more a technology is perceived as useful and easy to use, its' actual usage increases. In the context of this study, both teachers and students were found to accept the use of laptops in pedagogical activities. They also agreed to the usefulness of laptops and their capacity to enhance the acquisition of 21st century employability skills like communication, creativity, collaboration and critical thinking skills. According to Davis, the more teachers and students are brought to perceive the use of laptops as a useful and easy-to-use digital technologies in teaching and learning, adopting a positive attitude towards their use despite the challenges, the more the actual usage of the technology in the context of instruction can be improved. These will likely impact students' ability to acquire communication skills, be creative, stimulate critical thinking in them, instill teamwork spirit, and above all, improve their academic performance.

Teachers' Appreciation of the use of Laptops in Teaching for the Acquisition of 21st Century Employability Skills by Students

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Table 6:

Teachers' Opinion on the Use of Laptops in Teaching

	Themes	Quotations
Use of Laptops	Frequently used by teachers	"I use the laptop regularly in my teaching" "I use the laptop computer every time in my teaching" ".I used the laptop during teaching regularly"
	High usage by students	"Laptops occupy a very important place because my students and I use them all the time" "A very important place in my teaching"
Appreciation of the use of laptops	Information sourcing	"Almost all my students use laptops in their studies and they master how to source information". "Most of my students are digital natives, they use laptops very well and are capable of sourcing information using them". "My students use these devices in searching for information from different sources with ease"
	Enhance communication skills	'Laptop computers help check spelling, correct grammar etc. helping the student improve in language and communication as a whole" "These tools are first of all communications gadget which have been introduced to the teaching and learning environment. Oral and written Communication skills are enhanced". The laptop computer helps in grammar, proof reading, and spelling check". "Communication and the acquisition of the skill is at its best with the use of these tools in teaching". "These gadgets facilitate communication both oral and written".
	Enhance class interaction / collaboration	"Class interaction and working as a team is enhanced by laptops". "Class interaction and collaboration between students and between teacher and students is perfect with the help of laptops in teaching". "Student –teacher interaction continues even out of classroom and students' work in small groups is facilitated by the laptop computer".
	Enhance critical thinking	"Thanks to the variety of information sources that the tools make available to the students, they can easily get inspiration from them to generate their own ideas.
	Creativity	"Students are always verifying what internet sources say about every topic they want and the use of the laptop can enable them develop the capacity to generate their own solutions to challenging situations". "Through information gathering from other sources thanks to the laptop, my students are able to generate their own solutions to challenging situations with ease".

Based on teachers' opinion on laptops used in teaching, many of them said they frequently used laptops in teaching as depicted in the following statements: "I use the laptop regularly in my teaching" "I use the laptop computer every time in my teaching" ".I used the laptop during teaching regularly." Based on teachers' appreciation of the use of laptops in teaching, many of them said it helps students in

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sourcing for information, as depicted in the following statements: "Almost all my students use laptops in their studies and they master how to source information". "Most of my students are digital natives, they use laptops very well and are capable of sourcing information using them". "My students use these devices in searching for information from different sources with ease"

Many of the teachers said that laptops enhances students' communication skills, as depicted in the following statements: "Laptop computers help check spelling, correct grammar etc. helping the student improve in language and communication as a whole" "These tools are first of all communications gadget which have been introduced to the teaching and learning environment. Oral and written Communication skills are enhanced". Many of the teachers also added that the use of laptops in teaching enhances class interaction and collaboration among students, as depicted in the following statements: "Class interaction and working as a team is enhanced by laptops". "Class interaction and collaboration between students and between teacher and students is perfect with the help of laptops in teaching". "Student –teacher interaction continues even out of classroom and students' work in small groups is facilitated by the laptop computer" Again, many of the teachers said laptops enhances critical thinking skills in students, as reflected in the following statements: "Thanks to the variety of information sources that the tools make available to the students, they can easily get inspiration from them to generate their own ideas" Finally, many of the teachers also said that the use of smart phones in teaching enhances students' creativity due to the ability of students to copy, imitate and gain inspiration from information gathered from different sources as depicted in the following statements: "Students are always verifying what internet sources say about every topic they want and the use of the laptop can enable them develop the capacity to generate their own solutions to challenging situations". "Through information gathering from other sources thanks to the laptop, my students are able to generate their own solutions to challenging situations with ease".

Verification of Hypothesis:

Ho: The use of smart devices in teaching does not significantly enhance students' acquisition of 21st-century employability skills in state universities in Cameroon

Ha: The use of smart devices in teaching significantly enhances students' acquisition of 21st-century employability skills in state universities in Cameroon.

Table 5:

Perceived Impact of Smart phones and laptops in Teaching on Students' Acquisition of 21st-Century Employability Skills

		Use of smart phones and laptops in teaching-learning	Students' acquisition of 21st-century employability skills
Spearman's rho	R-value	1	.418**
	p-value	.	.000
	N	386	386

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

Statistically, the findings of the study showed that the use of smart phones and laptops in teaching had a significant, moderate, and positive impact on students' acquisition of 21st-century employability skills (r-value = 0.418**, p-value 0.000 0.05). The positive sign of the correlation value implies that students are more likely to acquire 21st-century employability skills when adequately exposed to the use of smart phones and laptops in teaching and learning. Therefore, the hypothesis that states that the use of smart devices in teaching significantly enhances students' acquisition of 21st-century employability skills in state universities in Cameroon was accepted.

Table 5:

Regression Estimating the Unit of Impact of the use of smart devices on Students' Acquisition of 21st-century Employability Skills

	Unstandardized Coefficients		Standardized Coefficients	t test	*p*-value
	B	Std. Error	Beta		
Constant	11.074	2.096		5.284	.000
Use of smart devices in teaching	.461	.079	.267	5.816	.000
Model Summary					
R (Multiple coefficient determination value)	.476				
R-square	.227				
Adjusted R Square	.218				
Std. Error of the Estimate	5.654				
ANOVA[a]					
F- test value	27.892				
P-value	.000				

a. Dependent variable: Enhancing acquisition of 21st century employability skills

b. Predictors: (Constant): Use of smart devices in teaching

Regression analysis showed the following statistics, at a significance level of 0.000: that holding all other factors constant, a unit of improvement in the use of smart phones and laptops in teaching, every other factor being constant will lead to a 0.461 increase in students' acquisition of 21st century employability skills. The model was significant (F-test value = 27.892, p-value 0.000), and total variability was explained at 47.6% (R = 0.683), while 52.3% was not explained.

Finally, going by the descriptive statistics, inferential statistics, thematic analysis, regression analysis, and the empirical literature that corroborates the findings of this study, it can be concluded that the use of smart phone and laptops in teaching each have a significant, moderate, and positive impact on students' acquisition of 21st-century employability skills in state universities in Cameroon.

CONCLUSION

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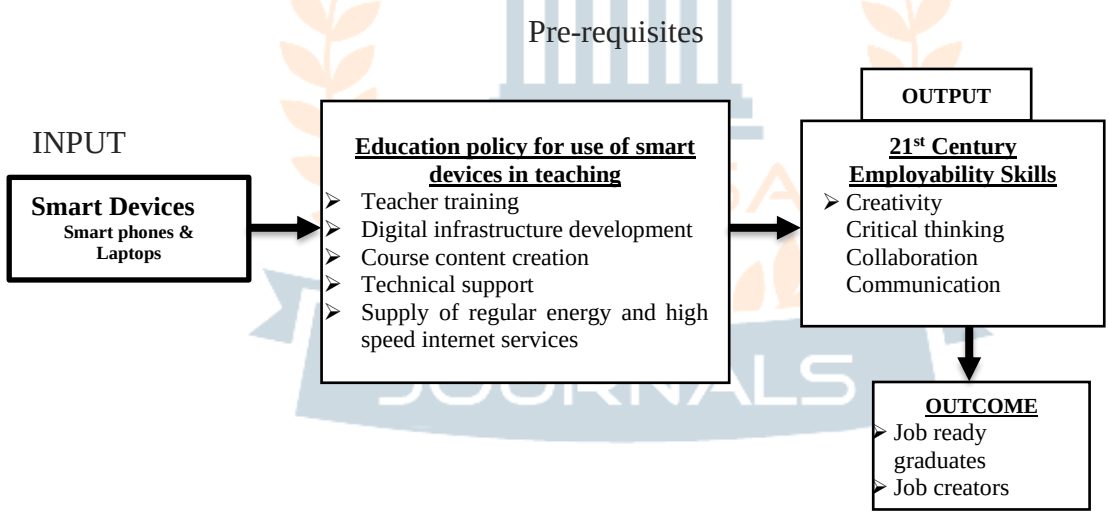
From the findings of the study, the following conclusions were drawn: that smart phones and laptops are well used in pedagogical activities in state universities in Cameroon; that the use of smart phones and laptops in teaching has each, a significant, moderate, and positive impact on students' acquisition of 21st-century employability skills: communication, creativity, critical thinking, and collaboration (r-value = 0.418**, p-value 0.000 0.05); that regression analysis show that a unit improvement in the use of either smart phones or laptops in teaching, with all other factors held constant, results in a 0.461 increase in students' acquisition of 21st century employability skills at a significant level of 0.000, and that teachers and students reported that a major challenge in the use of these devices in teaching is distraction.

RECOMMENDATIONS

From the findings of the study, it was recommended that government should make teaching with smart phone and laptops a policy in state universities, while university authorizes should encourage teachers and students to increase the use of their smart phones and laptops in pedagogical activities. It was also recommended that government ameliorates on the quality of internet connection and energy supply.

Figure 1

Proposed Model for Teaching with Smart Devices in State Universities in Cameroon.



For the effective use of smart phones and Laptops in teaching in state universities in Cameroon, government should as a matter of priority cause the adoption of a policy for the use of these smart devices in teaching within the higher education sector. This policy should define what model of techno-assisted teaching is to be carried out in the higher education sector: either it is distant learning, online teaching or blended learning models. This policy on the use of smart devices in teaching will be incumbent on all teachers. The government will hence guarantee the effectiveness of the use of these smart devices through provision of material, financial and human resources necessary for the proper functioning of teaching with these devices: Course content creation, technical support, teacher training, the supply of constant electricity and internet to name just a few, will be taken care of by the state.

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