Use of Instructional Videos to Augment the Teaching of ICT Practical Sessions in the midst of Higher Students Enrollment

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ABSTRACT: *The current study looked at how instructional videos were created and used to augment the practical teaching and learning of information and communication technology (ICT) course. With a sample size of 1620 students, the researcher created customized short instructional videos on the different topics on the course outline and shared videos on the platform of the students in the Fall of 2021/2022 school year. The researcher found evidence that the use of the instructional videos was helpful in the practical lessons. Second, participants indicated that using the instructional videos was their first time in this university. Finally, the participants expressed their desire to use the instructional videos in the near future as well as recommend to their peers in other programmes. Implications for practice are discussed.*

INTRODUCTION

The introduction of the Free Senior High School (SHS) Policy by the New Patriotic Party (NPP) government in the 2017 has created big opportunity for unprecedented number of students, who hitherto would have been denied of senior high school education in spite of having qualified in the Basic Education Certificate Examination. The Government of Ghana, for the first time, paid all school related fees for the first-year senior high school students, who numbered 361,771 as well as provided subsidies for the continuing students during the 2017/2018 school year (MoF, 2018). The second year into the implementation of the policy (2018/2019 school year) shot up enrollment

levels at 490,882 students indicating a sharp increase of 36% over the previous number of students admitted (MoF, 2019). Six years since the introduction of the Free SHS Policy in Ghana, there has been an unpresented number of students who are qualified and ready for tertiary education at the country's colleges and universities. The sudden rise in the students' enrollment at the tertiary level has also created untold pressure on colleges and universities facilities across the country. One area that is suffering is the teaching of practical courses in ICT due to the number of students who have to be at the laboratory for practical sessions at a time. One of the surest ways to manage the students' numbers in a practical course is the use of instructional videos. Ou, Joyner and Goel (2019) indicated that the use of instructional videos has become ubiquitous in formal and informal settings of learning. The researchers further reported that there has not been much research on how to develop and design videos for instructional purpose.

Using instructional videos as a teaching and learning tool for practical courses at the university level provides a range of benefits to both students and instructors. The videos can help lecturers to explain more difficult materials and demonstrate hands-on skills in a more meaningful way. Again, instructional videos can create opportunity for students' engagement and interest in the subject matter, makes it easier for the learners to relate to the content and use what they have studied (Nugraha & Widiana, 2021). As educators are called upon to be inclusive with diverse learners, videos can enhance accessibility for learners with special needs since they provide visual and auditory (dual coding) content that can be easily understood (Robertson & Flowers, 2020). As videos provide the learning opportunities to shades of learners, they can be used to supplement other resources and accommodate different learning styles being visual, auditory, tactile or other representations of knowledge (Roux & Nagel, 2018).

The provision of adequate 21st century digital tools and applications in the classroom continues to be part and parcel of the teaching and learning process regardless of the level of the educational system (Chorianopoulos, 2018; Morrison & Lowther, 2010). In spite of this urgency, there are serious challenges that many African universities face when it comes to the provision of adequate digital tools and applications for learners to interact with in the teaching and learning process, especially, of the practical courses (Buabeng-Andoh & Yidana, 2015; Dawson, 2008). Buabeng-Andoh and Yidana further concluded that "the availability of training, the availability of school support, availability of computers, the availability of electricity and the availability of internet connectivity are inadequate, indicating that these factors are concerns of teachers" (p. 109). Whereas some of the traditional universities in Ghana have almost adequate Information and Communication Technology (ICT) tools in their various computer laboratories, there are others

who still find it difficult to setup and maintain user-friendly ICT laboratory to help university students learn the required literacy.

Anecdotal records indicate that the ratio of a student to a personal computer for the last four years of the institution under review has been an average of one personal computer to about 28 students. Mumtaz (2000) provided evidence of a strong correlation between higher performing schools in the ICT and the availability of the ICT resources in such schools. The idea of dividing students into several groups in order to get access to the computer laboratory falls flat in the face of the above study. In many cases, three students are assigned to one personal computer. This intervention also reduces the level of access of a student to a personal computer as against one student to a personal computer during practical sessions. With programmes of large class sizes, many of the students are more likely to intentionally skip the laboratory sessions. Lee (1997) indicated that there was the need for the universities and colleges to provide quality ICT knowledge because many of the non-traditional university students did not get ICT knowledge when they were at the basic and secondary levels of education. Such a trend does not augur well for the students to master the practical skills needed for life and invariably results in graduating students who are technologically not proficient for the world of work. With the few who will be able to demonstrate better performances in the use of ICT, they will still have a struggle when it comes to pedagogically using the ICT Skills to help the students to learn.

In Ghana, many of the elementary schools, across the country do not have ICT laboratories (Peprah, 2016). As a result, students at the elementary school level do not get the opportunity to have first-hand experience with the use of these technologies. The British Educational Communications and Technology (2004), in their work titled "Review of the Research Literature on Barriers to the Uptake of ICT by Teachers" indicated the need for elementary schools to be resourced with digital tools and software applications. The situation at the high school level is a little different from the elementary school level. At this level, almost all the senior high schools in the country have computer laboratories. One would expect that the high schools that have many of the ICT laboratories in Ghana will be a turning point for the students. At the high school level tool, information and communication technology (ICT) is neither taught as an examinable subject nor knowledge of it required during examinations. In addition, Buabeng-Ando and Yidana (2015) concluded that the second cycle teachers in Ghana were yet to exploit the full affordances of ICT and as a result struggled with integrating technology into the teaching and learning. For this and similar other reasons, students are not motivated to take the learning of the 21st century tools serious. Consequently, the students are enrolled in the universities across the country with

challenges in using the 21st century global tools. This inability to provide the required proficiency in ICT at the pre-tertiary level has a cycle, where students' year after year come and demonstrate inadequate knowledge in the use of information and communication technology tools.

1.1 Statement of the Problem

Use of instructional videos is gradually becoming indispensable in many institutions of training and other corporate organizations. Trainers are taking advantage of the enormous impact it has on the learners and as a result use these videos to their advantage (Allen & Smith, 2012; Hsin & Cigas, 2013). However, there are many faculty members in Ghana who are yet to realize the affordances that come along with the use of instructional videos in the teaching and learning process. In recent times, it has become difficult for faculty to reach out meaningfully to the learners during practical sessions due to the size of the class. It is common to see students in their laboratory suit waiting in line all day to get to the laboratory. The impact of the inadequate access to the laboratory for practical sessions is felt when students fail to obtain the required grades expected by the lecturers at the end of the semester. In many cases, the poor students' performance is as a result of denial of access to the laboratories or a reduced time access in order to make room for the other students to also come to the laboratory. Thus, topics that come with considerable amount of difficulty and as such requires illustrations, calculations, and hands-on activities suffer. The students fail to grasp the major concepts of the various topics and invariably contribute to the churning out of graduates with many deficiencies in their areas of specialty. Against this backdrop, the use of instructional videos presents promises to the teaching and learning practical oriented courses.

1.2 Cognitive Load Theory

The cognitive load theory came from the field of cognitive science by an Australian psychologist John Sweller in the latter part of the 1980s (Houichi & Sarnou, 2020). Sweller (1988) explained that the human working memory was so limited in terms of the amount of information that it could process within a period of time. For this reason, there was the need for instructors to be mindful of this deficiency of the working memory so as to design instruction that would not overload or place knowledge in excesses on the working memory. In order to make learning more effective, Sweller (1988) went on to suggest some techniques that instructors could adopt in order to make their instruction align with how the working memory processes information. Sweller (1994; 2010) provided explanation of three distinct types of cognitive load by which the brains of learners could be constrained during the teaching and learning process. These were intrinsic load, germane load

and extraneous load. Out of these three types of cognitive loads, instructors are to manage the intrinsic and germane loads and use better instructional choices to reduce the extraneous load to the barest minimum. Based on the cognitive load theory, there are natural cognitive loads that instructors are not able to avoid even when they come out with instruction consistent with the cognitive architecture of the human brain. In situations where practical courses are handled without the requisite teaching and learning technologies, the students would be over-burdened with knowledge more difficult to grasp. And coupled with poor instructional choices, it would be hard on the learners to be able to learn meaningfully. This will call for tried and tested instructional methods when dealing with courses that require the use of technologies.

University Students and Smartphones

The integration of smartphones in the teaching and learning experience is consistent with the constructivism. The constructivist is of the view that children (students) create their own knowledge as they are exposed to the teaching and learning experiences rather than being spoon-fed by teachers in a typical behaviourist learning environment (Sternberg & Williams, 2002). Constructivism embodies the ideas of discovery learning. For one to obtain knowledge for himself or herself requires an active participation of the learner in the various activities of the lesson. Smartphone use with its numerous software applications provides flood of options available to the student to explore the learning environments rather than listen passively to teachers. The number of university students with smartphones keeps on increasing. Manu et al, (2018) reported that 74.3% of students of university had smartphone with 25.7% of the participants either did not owe smartphone, loss of their phone or owed faulty phones. Since there were no previous studies to compare the trend of smartphone ownership among university students in Ghana, it was a little difficult to have a comprehensive idea of how university students have owned phones over the years.

In an attempt for faculty to consider using instructional videos in the teaching and learning process, there is the need to figure out the medium by which the students would access the videos. The context within which the instructional videos is provided is something that has to be considered as part of the front-end analysis (Dick, Dick & Carey, 2005). Research shows that there has been increased acceptance of the use of smartphones among students at the higher learning of level (Manu, et al., 2018). Wong and Wong (2016) commented that the improvement in the digital tools and applications has created opportunity for lecturers to use their phones to engage their learners meaningfully. Miah, Hossain and Rahman (2017) also indicated that the smartphone is an

important communication tool and therefore, people need to use it appropriately to facilitate learning.

Smartphones have seen a lot of advancement with regards to the functions they can perform. Emmanuel (2013) surveyed 403 students in one of the universities in the United States with the view of reporting on the ownership; general use; in-class use; perceived appropriate use; and general attitudes, feelings and opinions about cell phones. The researcher concluded that: (1) they are pervasive and powerful; (2) they help meet basic needs of convenience and safety; (3) they provide new, but not necessarily superior means of communicating with each other; (4) they encourage talk, not conversation; (5) they link users to those they know, but remove users from the strangers who surround them in public" (p. 75). This study was ten years ago and as a result of the advances in the applications on the various brands of smartphones, students can accomplish more within the instructional process. Smartphones are found everywhere and students use them for varied purposes on various campuses across the globe. Nonetheless, their use for educational purpose, especially within the classroom, has generated a lot of resistance from educators. It is admitted that smartphones could help with many pedagogical activities but can also be a potential source that could divert students' attention in class (Batista & Barcelos, 2014). This therefore opens the discourse on how effectively smartphones could be incorporated into the teaching and learning experiences of higher education. Smartphone usage in classrooms and for academic purpose has been investigated among students from United Arab Emirates through a survey study. Results of the study specified that students use smartphones for their academic purposes such as downloading study material, browsing for related course material and reading. The cumulative effect is motivation to participate in class discussion, improvement of studying skills, early preparation and submission of assignments (Johnson & Radhakrishnan, 2017).

According to Bentley (2017), there are different ways that the classroom teacher can integrate the use of smartphones by students in the teaching and learning experiences. The researcher explained further that there are many applications installed on the smartphone that makes it possible for the learners to immerse themselves with the content regardless of the time or place. Among the things discussed by the researcher were access to internet, access to social media sites, availability of cameras, opportunity to do online discussions, calendar for organization of events, video and audio recording of lectures, among other things. In comparison,

Instructional Videos in Higher Education

The idea to bring instructional videos to the classroom as either supplementary material or the main content for a particular course at the higher education level has been around for some time (Gold & Holodynski, 2017). Instructional videos have the ability to carry different forms and levels of learning for different disciplines based on the audio and visual dimensions they carry (Moussiades, Kazanidis, And Iliopoulou, 2019). Beheshti et. al, (2018), in their project dubbed the *characteristics of instructional videos*, explained thirteen characteristics of instructional videos. These were increased social interaction; unlimited accessibility; provide individual learning environment; simpler delivery; improves motivation and concentration levels, etc. (p. 63-64). The researchers further added that instructional videos continue to present learning opportunities for online and blended modes in the last decade. Luangmongkol (2021) explained that the content of the videos could be designed in such a way that it is easily made available through the smartphones of the students in order to make the learning of the content more convenient on the learners. The availability of the videos on their phones provides the learners with the opportunity to learn the materials regardless of the time and place of the day (Birundha, 2020). To Srinivasacharlu (2020), the students are able to pause back and forth as well as repeat certain aspects of the content until they are able to relate to the content of the videos. Such features of the instructional videos allow the students to take meaningful notes since the videos are available on their smartphones with no distractions whatsoever as usually experienced are the lecture halls.

In a research methods and statistics course with a higher failure rate as well as dropout of learners from the course, Henderson (2019) reported how the use of short instructional videos, released on weekly basis in an 8th week period, changed the outlook of her course. At the end of the period, there was 90.5% success rate. The students confirmed at the end of the semester that the instructional videos were helpful to them in a survey administered to these university students. They further recommended that similar videos be used in other courses to make the teaching and learning less stressful. Similar study in the use of instructional videos to augment the face-to-face teaching and learning had majority of the students passing the course (Breneiser et al., 2018). Fyfield, Henderson, Heinrich and Redmond (2019), in their editorial issue titled "Videos in higher education: Making the most of a good thing", explained three areas where the use of instructional videos has seen many research activities in the past decade. These were "improving video design, investigating platforms and technologies that increase student engagement, and developing pedagogical approaches that take full advantage of the affordances of videos" (p. 1). Likewise, Sonmez and Hakverdi-Can (2012) observed that preservice teachers were able to develop good

observational skills in complicated instructional environments and therefore concluded that such a feat was more likely to influence positively in their own teaching. Fyfield (2022), studying the uses of instructional videos in mainstream classroom, reported that the use of videos has a clear link between the experiences of the teacher user and the extent to which the videos could be innovative to address the learning needs of the students. For this reason, he concluded that the use of the videos is a pedagogical skill on the part of the teacher that needs to be improved as he or she practices. The findings call for teachers to start thinking of the innovative ways they can use the videos to engage their learners

Characteristics of good Instructional Videos

There are different kinds of instructional video formats available on the landscape. However, there has not been conscious effort to compare the different formats in order to come out with heuristics on how to prepare instructional videos (Chorianopoulos, 2018). As institutions of higher learning begin to embrace the integration of instructional videos into the teaching and learning process, a need exists to be familiar with the different formats of videos available. Beheshti et al., (2018) reported that videos were being used as the principal delivery system of information or used to supplement the traditional face-to-face method of teaching. According to these researchers, there seems to be a shift from the traditional method of instruction to the incorporation of videos in many blended and online courses. In their study captioned "Exploring the Creation of Instructional Videos to Improve the Quality of Mathematical Explanations for Pre-Service Teachers", Kay and Ruttenberg-Rozen (2020) found that preservice teachers struggled in the creation of instructional videos for mathematical course. Among the challenges were "providing a clear problem label, using visual supports, noting potential errors that might occur, writing legibly, highlighting key areas, listing key terms and formulas, being concise, and using a clear, conversational voice" (p. 1). Carson and Choppin (2021) explained that there were challenges with logistics and human capacities especially in the rural areas in the attempt of teachers to integrate instructional videos into distant learning.

Since videos have taken the center-stage in the various halls of higher education, it is prudent to pay attention to some of the features of a good instructional video. Beheshti et al., (2018), after reviewing literature on tips in creating instructional videos shared their general view on how to make instructional videos more impactful in the teaching and learning process. The tips shared by these researchers were as follows:

1. Need to be objective-oriented
2. Simplicity and shortness of the videos

3. Text for specific highlights
4. Use of graphics to provide visual backgrounds
5. Provision of closed caption to enhance cognition
6. Clarity of the voice
7. Use of screen recording
8. Animated characters to make the videos interesting (p. 67).

Research Questions

1. What percentage of students uses smartphones?
2. What is the prior experience of students with the use of instructional videos?
3. How do students see the quality of the instructional videos?
4. Would students recommend the use of these instructional videos to their course mates?

METHODOLOGY

The researcher used survey research design to collect data from 1620 out of the 1800 students from one of the public universities in Ghana after completing an introduction to Information and Communication Technology (ICT) (GPD 112) course in the Fall semester of 2022. The ICT laboratory had fifty (50) desktop computers to serve 1800 university students in the Fall semester of 2022. Due to the students' class sizes, ranging from 60 students per a programme to 477 students, it was not feasible to give adequate practical instructional time to each student as required. For this reason, there was the need to come out with an intervention to make sure that students have the opportunity to learn meaningfully at the lab and outside the lab. Based on the situation, the researcher designed instructional videos for the 1800 students via the course platform on WhatsApp.

Development of the Instructional Videos

The researcher designed and recorded series of screencast videos with the Camtasia 2021version application software. Areas like windows management, Microsoft Word, Microsoft Power Point, Microsoft Excel, emailing (Gmail), Google Sheets, Google Forms, and Google Sites were carefully broken down into specific competencies that the students were required to master. Each of the videos lasted for a maximum of one minute. This strategy of the short duration of the video was to make it possible for easy download. At the same time, it was intended to help the students to stay focused and learn one concept of the topic at a time. Finally, each set of videos for a particular topic was made available to the students on the platform just after going through the

practical session at the computer lab. At the end of the semester, the researcher announced to the students of the intended research and explain the need for them to take part in the online survey. After the announcement, a link to the survey questions was shared with the students on their course platform.

Instrument

The questionnaire was developed by the researcher after piloting the items for three consecutive times with the view of improving upon the reliability of the constructs. The questionnaire had three sections based on three constructs (experience of the instructional video, quality of the instructional video and the extent to which the respondents were likely to recommend the use of the instructional videos to other students). The three constructs had ten, eight and four items respectively after running the reliability test to delete the items that did not align well with the constructs being measured. The Cronbach Alpha for the three constructs were 0.84, 0.91 and 0.92 for experience of the instructional video, quality of the instructional video, and the extent to which learners were willing to recommend the use of the videos to their mates. The link to the survey was active for three weeks with weekly alert to remind students of the need to respond to the survey questions so as to use their feedback to improve upon the quality of the teaching and learning of the ICT course.

Demographics

In order for the readers to have some level of background knowledge of the nature of the respondents used in the study, the researcher collected data on the gender, age and ownership of smartphone. Out of the total cohort of 1800 students, 1620 took part in the study representing 90%. The number of male students, who took part in the study was more than the number of females. The males were 1166 students, representing 72% whereas the females were 454 students, representing 28%. Table 1 has information on the gender outlook of the respondents.

Table 1. Gender of Respondents

Gender	Frequency	Percentages
Male	1166	72.0
Female	454	28.0
Total	**1620**	**100**

In terms of the age of the students, the researcher wanted to know the average age and the standard deviation of the of the total respondents on one hand, as well as certain categories of ages of the students for analysis purposes. After running the simple descriptive statistics, the mean age was 25.2 years with a standard deviation of 3.8 years. It seems to suggest that the respondents were comparatively older than the ages one would expect with traditional university students. This finding, based on the normal curve, would imply that about 68% of the respondents' ages were from 21.4 – 29.0 years. As a follow-up activity to further understand the age distribution of the respondents, they were divided into three groups. The categories were 18-22 years, 23-25 years, and 26 years and above. There were 398 respondents, representing 24.6% for the first category. The rest were 577 respondents, representing 35.6% for ages 23-25, and 645 respondents, representing 39.8% for 26 years and above.

Table 2. Age of Respondents

Age	Frequency	Percentages
18-22	398	24.6
23-25	577	35.6
26 and above	645	39.8
Total	**1620**	**100**

The ownership of phones has gradually become a commonplace in Ghana as compared to the use of personal computers. The researcher wanted to identify the number of students who have phones during the semester under review. After the data analysis, the researcher found that 96.6% of the university students owned smartphones whereas 3.4% of them did not have smartphones. The findings seem to suggest that mobile learning continues to be promising if faculty members would take advantage of it. At the same, there are still a number of students without smartphones and must be factored into the instructional process by the members of faculty. Table 3 provides additional information on phone ownership.

Table 3. Smartphone Ownership of Respondents

Ownership of phones	Frequency	Percentages
Yes	1565	96.6
No	55	3.4
Total	**1620**	**100**

RESULTS AND DISCUSSIONS

The purpose of this study was to identify the perception of university students on the use of instructional videos to augment the practical ICT lessons. With a sample size of 1620 students, the respondents shared their views on the knowledge of instructional videos, the quality of the videos and the extent to which they were likely or not likely to recommend the use of instructional videos to their peers at the university. Below is a presentation of the findings and discussion of these findings.

Research Question 1: What percentage of students uses smartphones?

University students are always glued to their phones and there was the need to investigate the number of students with smartphones for instructional decision purposes. The researcher found evidence that 96.6% of the participants has smartphone. This finding shows that there has been a significant increase in smartphone ownership among students for the past four years. Manu et al, (2018) reported that 74.3% of students of the same university had smartphone. The 22.3% increment in smartphone ownership is an opportunity for lecturers to begin thinking about how they can engage their students within and without the lecture hall with smartphone-based activities. Though the percentage of smartphone use is on a higher side, this finding seems to suggest that there are still other university students in the 21st century who have no smartphones in case they are to use them to aid their academic work. Nonetheless, they should not be left out when teachers are planning for mobile learning or academic activities that would require that students use their smartphones to accomplish such tasks.

Research Question 2: What is the prior experience of students with the use of instructional videos?

The researcher wanted to identify the prior experience of the students before the introduction of the videos as well as the extent of training provided to the students before using the videos. With ten items to measure this construct, the first five elicited data to suggest that the lecturer of course provided the students with adequate information on when and how to use the instructional video. From a lowest mean score of 3.95 (*SD= 1.56)* to a highest mean of 4.18 (*SD= 1.48)*, there seem to be an agreement that students were provided with adequate training on the use of the videos before the videos were provided. The provision of this vital information before the start of the sessions is of major importance to the instructional designer due to the potential cognitive overload that can be created for the learners (Sweller, 1994, 2010).

However, on the second five items purported to identify whether the participants had been exposed to instructional videos, the mean figures ranged from 2.37 (*SD= 1.64*) to 3.76 *SD= 1.61)*. The finding seems to suggest that the use of instructional videos was not common among the students in other courses of the semester. For example, over 72.1% indicated that the use of instructional videos was not common in the other courses they have enrolled in the semester. The implication of the finding was that the lecturers were predominantly using the traditional lecture method, which is evidently known that when solely used is not in the best interest of the students. The Table 4 has detailed information on the mean and standard deviations of the various items.

Table 4. Prior Experience of the Students with the Use of Instructional Videos

No.	items	Mean	SD
Exp_1	I am aware of videos created by my lecture	4.18	1.48
Exp_2	I am informed that videos on lectures are on WhatsApp as well	3.95	1.56
Exp_3	I had instruction on how to download the videos on the platform	3.91	1.54
Exp_4	The videos were available on time to students	4.02	1.49
Exp_5	The availability of the videos was announced to the whole class	4.11	1.49
Exp_6	I was expecting to get videos on ICT topics	3.73	157
Exp_7	Teaching videos are commonly used by lecturers	3.24	1.67
Exp_8	This is my first time of getting video of this nature	3.70	1.65
Exp_9	I have received similar videos from the other courses	2.37	1.64
Exp_10	I had instruction on how to use the video	3.76	1.61

Research Question 3: How do students see the quality of the instructional videos?

Since the purpose of the instructional videos was to help improve upon the teaching and learning of the course, there was the need to collect data on the quality and suitability of the videos. With

the items to solicit data on different aspects of the videos like text, picture, speed, sound, order of presentation and so on. From the data, item four had the least mean score of 3.24 (*SD=1.66*), which sought to ask information on the coverage of the instructional videos on the various topics on the course outline. Also, item two on the sound quality of the videos had a mean of 3.61 (*SD=1.56*). this finding indicates there were some issues with the sound of the videos, which is directly linked with the ability of the students to clearly hear the content of the videos and understand it. Here, one would expect the clarity of the sound of the videos to be at least a mean score of 4.0 or better to ensure that there is no miscommunication whatsoever when it comes to the content. Among the items that received the slightly highest rating was item five, which centred on whether the videos were presented logically one after the other. Once again, the ability to present the material logically reduces the level of the cognitive overload that the learners have to experience (Sweller, 2010). Luangmongkol (2021) observed that it is the responsibility of the one using the instructional videos to pay close attention to the quality of the videos and the processes involved in the production before they are used in the teaching and learning process.

Table 5. Quality of the Instructional Videos

No.	items	Mean	SD
Quali_1	The pictures of the videos were clear	3.87	1.49
Quali_2	The sound of the video was clear	3.61	1.56
Quali_3	The speed of the video was appropriate	3.93	1.41
Quali_4	The videos covered all the topics for the semester	3.24	1.66
Quali_5	The lecturer presented the videos logically	4.07	1.42
Quali_6	I had no difficulty following the videos	3.80	1.54
Quali_7	All the texts in the video were clear	3.81	1.51
Quali_8	I could zoom in and zoom out when watching the video	3.80	1.59

Research Question 4: Would students recommend the use of these instructional videos to their course mates?

There were four items that sought to collect data on this research question. Among the three constructs, the one on recommendation received the highest mean rating. Almost all the mean scores for the various items fell within the strongly agree range of the Likert scale. With this finding, the participants indicated their willingness to use instructional videos in the future as well as recommend to their course mates to take advantage of the learning opportunities that come along with them. The implication of this finding is that the participants were receptive to the use of instructional videos during practical sessions at the laboratory and that can be extended to the other practical courses that supplement the teaching and learning process (Roux & Nagel, 2018).

Table 6. Recommendation of the Instructional Videos

No.	items	Mean	SD
Recomm_1	I would like to have similar videos in the future	4.21	1.39
Recomm_2	I would recommend the use of the videos to other students	4.25	1.37
Recomm_3	I would share the videos with friends who might need them	4.29	1.26
Recomm_4	I would like to use the videos beyond this course	4.18	1.39

CONCLUSION

In many Ghanaian universities, there are issues of inadequate digital tools and applications for effective practical lessons in information and communication technology. Fortunately, the creation and use of quality instructional videos provide stress-free just-in-time intervention to help the learners master the required literacy without necessarily being physically present at the laboratory during practical sessions in ICT. The ownership of smartphone among university students keeps on rising and as such, lecturers who have inadequacies in assembling the needed digital tools and applications, can take advantage of the use of contextualized instructional videos to help reduce the cognitive overload that learners encounter when learning practical courses in the traditional lecture format. Based on the current findings, many students are willing to get more instructional videos in other practical courses to help them easily understand the concepts. Meanwhile, majority of the lecturers, per this study, are not using these instructional videos in their various courses to ensure meaningful learning. The introduction of the Free Senior High School Policy in Ghana six years ago has led to a sudden increase in the enrollment levels of the senior high schools and as such there is huge pressure on the digital tools and software applications that are already available.

The use of instructional videos will go a long way to help the university students during practical courses.

Implication for Practice

1. That the use of smartphones is no more a luxury but a student life-survival tool that lecturers are supposed to take advantage of and integrate its use formally into the teaching and learning process.
2. The university students are more likely to learn meaningfully if ICT practical sessions could be supported with short instructional videos that teach them specific competencies instead of the sole traditional long lectures that are likely to be forgotten as soon as the session ends.
3. That lecturers who plan to use instructional videos should be mindful of the quality of the videos since it can work against the success of the video use. Issues like internet connectivity, phone compatibility, cost of data use, source of power, among others should be well-managed.
4. Creating simple short instructional videos for practical sessions allows for dual-coding, which is a recipe for meaningful learning among students. Need, therefore, exists for more lecturers to incorporate these instructional videos into the teaching and learning processes especially at a time that students' enrollment is increasing in many universities in Ghana.

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