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The Use of Information and Communication Technology and Social Media to Improve Change Planning and Effectiveness in Teaching and Learning among Ghanaian Graduate Students

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ABSTRACT

This study examined constituents of students' perceptions on student-instructor, student-student and student-content interactions in a graduate course at University of Ghana. A survey (n=77) and focus group discussion (n=6), were employed in a Research Methods class at the University. Main constituents of students' perceptions of and preference to student-student, student-instructor and student-content interactions were (1) perceived utility of course management systems and their ease of use; (2) perceived importance of social media and convenient access to instructors; and (3) perceived efficacy of the role of course multi-media and timely receipt of course information. The study concluded that, Sakai is a useful intermediary facilitating feedback provision, effective planning and promoting change in the design, development and delivery of graduate education.

Keywords: Content interactions, Collaborative, Inclusive Education Learning Pedagogy, Learning Management Systems, Sakai, SDG 4

INTRODUCTION

Modern society has been marked by a massive explosion of all kinds of technological advancements in the world. In the last three decades, global communication systems have given rise to a plethora of Information and Communication Technologies (ICT) that have made interactions possible across spaces (Chen, 2010). This has also resulted in the shrunken distance between remote places. All forms of technology, including ICT, are currently ubiquitous in universities and colleges (Aljawarneh, 2019). Seaman, Allen, and Seaman (2018) report that online enrollments in institutions of higher education in the United States have continued to grow with approximately 31.6% of all higher education enrollments in 2016, which is a 4.5% increase from 2012.

Advances in ICT have enabled the offering of online courses, distant education programs and the usage of online course management systems (Abrami et al., 2012). There has also been the creation of internet-based knowledge tools and course-specific software which have been designed to meet the ever-changing educational landscape. ICT educational tools provide new openings to reach non-traditional students, make distance mentoring possible and afford contemporary means of instruction, including the integration of online tools into face-to-face instruction models (Norberg et al., 2011). Online tools are providing new forms of autonomy to student-learning processes while offering opportunities for the creation of communities for learning and co-teaching. These tools also encourage co-participation – collaborating with others who have objectives similar to those others have already attained.

A number of universities in Africa have embraced the use of ICT for instruction and recruitment in their various fields of study (Ng'ambi., Brown, Bozalek, Gachago, & Wood, D. (2016). Apart from some programs using ICT for online courses, others are employing ICT for blended instruction (Willems & Bateman, 2013). The advantages of ICT in teaching are well documented. These include the ability to increase students' affective cognitive learning (Akcaoglu & Bowman, 2016). However, little is known about student preferences about specific ICT tools. Also little is known about how these specific ICT tools may help students to achieve learning outcomes. In the African context; this, therefore, is the focus of this exploratory study. A few studies have highlighted the problems instructors face in an attempt to incorporate learning technologies into their courses in Africa. For example, in a blended course environment, lecturers have had to abandon their intended blending model due to, among other problems, students' poor computer skills

and limited access to computers (Tshabala et al., 2014). We draw on the concept of interaction to implement three components of ICT instruction tools (Sakai – online course management system, email and social media – Facebook) in a graduate (post-graduate) blended Research Methods class at the University of Ghana. This study is important because an understanding of students' perception in student-professor interactions using ICT, creates the avenue for holistic and successful learning. The need to understand this perception is crucial because students' perceptions influence their attitudes toward learning (Ferreira & Santoso, 2008), which in turn impacts their performance. This paper clearly outlines four goals:

These goals are enshrined in the specific targets and indicators of the Sustainable Development Goals (SDG). The goal of the fourth SDG is to ensure there is inclusive and equitable quality education for all. It also aims at promoting life-long learning opportunities for all. The ways through which this study ensures the fulfilment of the aims of the said SDG goal are outlined as follows:

a. The use of ICT devices and applications for teaching and learning emphasize and promote gender equality in education. This leads to relevant and effective learning outcomes for both boys and girls (Target 4.1);
b. The promotion of the development of national benchmarks in the use of ICT devices and their application to champion effective and inclusive teaching and learning;
c. The attainment of affordable but quality technical, vocational and tertiary education for all women and men eliminates discriminations in many forms. (SDG Targets 4.5, 4.1, and 4.3). These goals help to put an end to gender disparities and promote the inclusion of people living with disabilities, indigenous peoples and children in vulnerable situations, among others; and
d. The application of this study and its findings will ensure that learners acquire the knowledge and skills needed to promote sustainable development. It will also ensure the promotion of human rights, gender equality, peaceful and non-violent cultures, global citizenships, the appreciation of cultural diversity and culture's contribution to sustainable development and the completion of tertiary education (SDG targets 4.7, 4.1).

CONCEPTUAL FRAMEWORK

ICT serves as a support structure to the achievement of all 17 Sustainable Development Goals (SDGs). With regards to the universal coverage of basic services, the use of ICT is especially essential in helping to advance these goals. By integrating the service of ICT into a country's public and private sectors, the goals put forth by the SDGs will be met more easily. The application of this knowledge, therefore, becomes crucial for governments of countries like Ghana where the implementation of SDGs is a priority. With a specific focus on the relevance of ICT in the attainment of SDG4 (a breakthrough for the achievement of quality education and lifelong learning for all), the issue of connectivity becomes extremely important. With connectivity and interactions, students can access learning resources and opportunities even in remote and low-income areas. Teachers can also prepare for their classes anytime and anywhere. ICT opens up access to education at all levels – graduate, undergraduate, secondary and basic – to all underserved populations for whom improved education opportunities lead to improved economic opportunities.

Interaction is fundamental to any informational and educational endeavor, and ICT enhances interpersonal communication and the flow of information required to achieve that enterprise. Over three decades ago, Moore (1989) identified three forms of interactions in distance education (1) student-student interaction – interactions among individual students and among students working in small groups, (2) student-instructor interaction – communication between a student(s) and instructor(s) and (3) student-content interaction – a student(s) making meaning of the materials in the subject matter under study. Studies on these interaction types have shown that the thoughtful designs of educational programs which include the aforementioned interactions result in a positive impact on student learning (Bernard, 2009). This is primarily because instructors are the connection between students and knowledge (Hassini, 2006).

Impediments to the incorporation of ICT tools into learning include inadequate technological literacy on the part of some instructors and students, the lack of access to the needed technologies, the inability to fully depend on the technology and difficulties in using the needed technology (Reid, 2014). In spite of these, ICT offers greater flexibility with respect to time and place when compared to only face-to-face interactions. The online learning environment does not, by itself, reduce the likelihood of students achieving learning outcomes (Hong, 2002). For this reason, students' feedback on

interaction in pedagogy has been a crucial determinant in the adoption of online technologies in teaching (Brown, 2016).

The use of course management systems has been shown to improve student learning, but it also cautions that merely posting syllabi on a learning management system would not constitute the satisfactory use of such a system (Brown, 2016). These systems have become platforms where many instructors are storing course content. Providing PowerPoint slide access to students has become easy due to course management systems (Worthington & Levasseur, 2015), and students are expressing positive attitudes toward PowerPoint slides for a number reasons including enabling them to record good course notes (Ahmadi et al., 2007). Thus, the perception of students, regarding their interactions with instructors, influences their performance. Although students with positive perceptions of student-instructor interaction have improved grades and report higher satisfaction with the course (Hong, 2002), some students have expressed a feeling of isolation in such learning environments (Hong et al., 2003). While the greater level of interactions with instructors is associated with higher levels of course satisfaction (Kuo et al., 2014), other researchers have asserted that student-instructor interaction is the best predictor of students' course satisfaction (Battalio, 2007). Consequently, it is essential to understand students' perceptions of their interaction with their instructors for the successful incorporation of ICT into teaching; this is important irrespective of the learning environment –blended or exclusively web-based.

LITERATURE REVIEW

Learning Management Systems

Research carried out in Ghana and elsewhere found that most students have used Learning Management Systems (LMS) and have had positive experiences. According to researchers, LMS' are used differently in different institutions (Dias & Diniz, 2014; Boateng, 2020, Asamoah, 2020). In the United States, LMS adoption by institutions stands at 99% and by faculty at 88% (Pomerantz, Brown & Brooks, 2018). When assessing the factors that contributed to the positive experiences with the use of LMS, Caruso and Kvavik (2005) also found that student participants who agreed or strongly agreed that "courses using LMS helped them to take greater control of their course activities in terms of planning and managing time", reported the most positive experience with LMS. Other factors which were realized to be important in the research were the perceived skills of the instructor and the instructor's use of the LMS to provide prompt feedback.

Flexibility in Using Learning Technologies

Learners always look for flexibility in time, space, place, content selection and delivery of instructions. In time past, however, learners did not have all of these variables at their disposal because the proper tools required to meet the learner's needs did not-exist. The flexible access to content and learning resources via networks across conventional classrooms, homes and community centres have been the defining characteristic of what has come to be known as distributed learning (Flecher et al., 2007; Shimoni et al., 2013). Being able to learn anytime and anywhere with synchronous and asynchronous communication across space, time and pace are key to web-based instruction. Communicating through e-mail, searching for information and locating a proper website has now become the key to success in online learning. Additionally, developing online and offline learning resources using various learning management system software have become some of the key competencies of modern-day teachers. Searching, locating and categorizing knowledge and information via the internet have opened new vistas in the implementation of flexible learning strategies.

Different types of Learning Management System

According to McNulty (2016), an increase in mobile access in Africa (especially in Ghana, Nigerian and South African markets) has enabled educational technology businesses and non-profits to broaden education, taking learning to students in the comfort of their homes who would otherwise be commuting daily to schools that are located in distant places. As education that that makes use of mobile devices such as cell phones, smart phones and tablets, mobile learning has the huge potential to be employed as a tool to create new education by African design. As more people gain access to mobile devices (while quality in-classroom education remains less consistently available), learners get additional ways to access and share vital knowledge using mobile devices (McNulty, 2016). The LMS markets, in similar vein, is expected to be worth over $15.72 billion in 2021 The highest proportion of revenue contribution is expected to be generated in North America with 42% and roughly half of all college classes will be eLearning-based (Pappas, 2020). Two Main types of LMS are generally discussed in African Tertiary Institutions. These are Cloud-based LMS and Open Source LMS. Examples of Cloud-based LMS in the African markets include: Docebo, Adobe Captivate Prime, TalentLMS, SAP Litmos LMS, LearnUpon LMS. And examples of Open Source LMS popular among African Higher Education Institutions include Sakai, Moodle, Chamilo, Open edX, Totara Learn and Canvas (Pappas, 2020). It is clear that eLearning has revolutionized

and changed the way knowledge and skill acquisition happens in African Education.

Utility of Learning Management System (LMS)

LMS allows effective complete overall control of administration, atomization, communication with users, teachers and trainers, and of course content management. Learning Management System (LMS) has been defined as a software that allows organizations and institutions of learning to create and manage lessons, courses, quizzes and any other training material (Ismail, 2017). An LMS enables a firm or institution to deliver training material and lessons to employees or students. Becker, Cummins and Davis et al. (2017) show that LMS is made up of a category of software and web applications that allow online delivery of course materials as well as tracking and reporting of student participation. Universities adopt LMS to manage and administer online and blended courses. With an LMS, students are able to access syllabi, notes, submit assignments, check grades, contact and communicate with faculty. Instructors are able to track the engagement and performance of each student. Within the higher education space, Becker, Cummins and Davis et al, (2017) point out that, some common LMS include Canvas, Blackboard, Moodle, Edmodo, Desire2Learn and Sakai.

Becker, Cummins and Davis et al. (2017) report that technology advancement of LMS has enabled institutions to access learning analytics, adaptive learning and dynamic communication. Nevertheless, there exist certain challenges which call for new and advanced models. The 2017 Higher Education Expert Panel, cited by Becker, Cummins and Davis et al. (2017) noted that the companies that own the LMSs tightly control their platforms. As a result, it is difficult for institutions of learning to customize and expand the features and integrate external features that best suit their needs i.e. both academic and institutional. Pomerantz, Brown and Brooks (2018) noted that, LMS has become vital to teaching and learning. A larger percentage of universities thus have in place an LMS. In the United States, LMS adoption by institutions stands at 99% and by faculty at 88% (Pomerantz, Brown & Brooks, 2018). This illustrates the importance of LMS for effective instruction delivery. Pomerantz, Brown and Brooks (2018) further pointed out that, as much as LMS is effective it has to be blended with face-to-face methods of teaching and that blended instruction has better learning results as compared to face-to-face or online learning alone. Kraleva, Sabani and Kraley (2019) proposed an analysis of the usability and software functionality of LMS frameworks. Based on the survey of the state-of-art science research,

the criteria for analysis of the LMS was summarized in three categories: Learning skills tools, Communication tools, and Productivity tools.

Social Media and Convenient Access to the Instructor

Martin, Wang, and Sadaf (2018) observe that facilitation strategies like timely instructor responses to email and discussion fora timely instructor grading and feedback of assignments, and instructor personal response to reflections appear more influential on key learning outcomes, whereas other strategies like synchronous learning sessions or an interactive syllabus have been less effective. Similarly, Martin and Bolliger (2018) note that instructor-led facilitation strategies leads to a stronger sense of community among the student. Martin and Bolliger (2018) also found that, students valued instructor-to-student interactions most when compared to student-to-student and student-to-content strategies. McNulty (2016) provided specific examples in Africa of cases where social media and mobile learning has been effectively used to transform and design education.

Course Multi-media and Timely Receipt of Course Information

Course multi-media improves communication among the instructor, student and content thus promoting a timely receipt of course information. Martin, Ritzhaupt, Kumar and Budhrani (2019) show that, online course facilitation broadly refers to how, what, when, and why an online faculty member makes decisions and takes actions to help students meet the learning outcomes. Course multi-media is what makes online course facilitation possible. Therefore, online course facilitation refers to the day-to-day operations of a "live" course (Martin et al, 2019). Best practices, standards, and competencies in the employment of course multimedia have been developed and tested in varying online courses across studies. According to Gillett-Swan, (2017), as online learning has the potential to isolate learners, the course multi-media used and facilitation strategies employed by faculty should target student behaviors that mitigate this threat. Guerrero-Roldán and Noguera (2018) observe that course multi-media helps in the selection of appropriate learning experiences and technologies that support learning experiences, and help educational administrators document the outcomes of courses and programs for accreditation purposes.

Interaction Mediums used in Ghana

Interactive multimedia education has contributed to improving the effectiveness of learning in African Higher Learning Institutions. In Kenya, Kipkurui, Wanyembi, and Ikoha (2014) reveal that, LMS is the backbone of

e-learning and universities have accepted e-learning systems and tools for teaching and learning. Universities benefited by having a suitable e-learning system and utilizing it correctly with benefits such as improved lecturer productivity, consistent learning, flexible delivery, measurable learning and multi-cultural learning.

In Ghana, different researchers working independently in different Institutions of higher learning have arrived as similar conclusions. These include, Asamoah, (2020), who found in a study of Moodle LMS at the Central University College that despite initial challenges, students found LMS useful in learning and that lecturers and school authorities played pivotal roles in routinizing LMS in the Ghanaian context. Asampana, Akanferi, and Ami-Narh (2017) investigating the factors that affected the post implementation success of a Web-based LMS at the University of Professional Studies, Accra (UPSA), in Ghana such as BlackBoard and Moodle found that, the level of acceptance of LMS was very low owing to poor IT infrastructure, inadequate training, and the relevance of the system to quality lecture delivery.

However, students' intention to use LMS and the usefulness of LMS were perceived to be high, especially among students at higher levels. Essel and Wilson (2017) investigating students' perception about the usefulness of the Moodle LMS as well as the perceived ease of use of Moodle at the University of Education, Winneba, in Ghana, found that students' perceived usefulness of Moodle combined with perceived challenges in using Moodle contributed significantly to their rate of Moodle use. Boateng (2020), researching on the Sakai Learning Management System at the University of Ghana, found that different categories of students namely; regular (residential), city campus (non-residential) and distance learning students improved their learning outcomes by using the Sakai LMS.

METHODOLOGY

This exploratory study used a mixed methods. It examined blended learning in a graduate (post-graduate) Research Methods class at the University of Ghana. The overarching objectives of the class included ensuring that students acquire practical research skills for business and academic research, enabling students to understand the principles of research, and aiding students to link the research process with theories of their specialty areas. A variety of class activities were employed. These were class discussions (multimedia cases and focus groups), online discussions (open

fora and online journal/blogs), guest and panel presentations (for real-world experiences) and face-to-face lectures.

For the purposes of this study, to ensure a variety of media for student-instructor interactions, the following were used: Sakai – a Course/Learning Management System with features such as a course document folder (where PowerPoint slides were uploaded for students to access), discussion boards/fora, email, group fora, and journals/blogs. Sakai is a free or open/community source, educational software platform designed to support teaching, research and collaboration. Systems of this type are also known as Course Management Systems (CMS), Learning Management Systems (LMS), or Virtual Learning Environments (VLE). Email – students were provided with the official email address of the instructors with no limitation on when to or when not to contact them. Emails could also be sent from students' Sakai accounts.

Social media –Facebook, an online social networking site accessible on computers and on mobile phones was used. A Facebook page was created for the class for student-instructor interactions and student-student interactions. Although students were encouraged to post and discuss course-relevant material, there was no restriction on what students could or could not post. Interactivity was achieved in three dimensions: The course was designed to enhance instructor-student, student-student and student-content interactions. Student-student interactions were promoted via the use of email, discussion boards, group work, blogs, chats, peer-editing/critiquing Student-instructor interactions were also promoted through the use of emails, discussions, announcements, chat rooms and videos. Student-content was also created using discussion boards, group work, submitted papers, quizzes, tests/exams, practice quizzes, projects, peer-editing and presentations.

Quantitative Results and Discussion

Table 1 shows the demographics of respondents in the research. Of the 77 students who participated in the study, 40 of them (52%) were female and 37 (48%) were male. All of these students were part-time students enrolled in evening and a weekend program of the University of Ghana Business School. All 77 research participants 72 (100%) were employed. And they were non-residential students. Respondents engaged in collaborative learning with their peers and instructors using social media – Facebook, WhatsApp and E-Mail and the Sakai LMS accessed with the use of their mobile devices and laptops. All 77 respondents owned a mobile device that helped them in their studies.

Table 1
Demographics of research respondents

Respondents Bio Information	Frequency	Percent (%)
Gender		
Female	40	52
Male	37	48
Student Status		
Full time	-	-
Part time	77	100
Employment Status		
Employed	77	100
Unemployed	-	-
Residential status		
On-campus	-	-
Off-campus	77	100

Instruments and Analyses

The two research instruments were assessed as follows: a survey questionnaire and a focus group discussion guide. At the end of the semester, students were given a survey questionnaire to complete to measure their perceptions on the various media for student-instructor interaction. The questionnaire contained a list of statements regarding inclinations towards the media of interaction used for the class and their thoughts on the utility of those media. The students rated their attitudes toward the questionnaire statements using a five-point Likert scale where responses were categorized into "strongly disagree", "disagree", "neutral", "agree", and "strongly agree." A total of 10 statements (items) were used (see Table 2).

The number of students in the class was 77 and all of them responded to the questionnaire. A reliability analysis was conducted (using Cronbach's α) to ascertain the internal consistency of the scale for preference for media regarding student-instructor interactions. A Cronbach's α value of 0.7 or higher indicated a very reliable scale. In order to extract the specific constituents of students' perception for the media used for student-instructor interactions, a Principal Component Analysis (PCA) data reduction technique was used (Jolliffe, 2002). To obtain reliable results, it is highly recommended that the minimum sample for analysis should be 100 or five times the number of variables to be analyzed (Jolliffe, 2002).

Table 2
Descriptive Statistics and Reliability Analysis for Student-Instructor Interaction

Survey Items	*Mean*	*SD*	*Item-Total Correlation*	*α if item deleted*
I often used the online office hours	2.7922	0.95059	0.279	0.691
I prefer the online office hours the most	2.9221	0.99692	0.238	0.697
SAKAI (online course management system) is easy to use	3.6753	1.22948	0.569	0.634
I like all the features on SAKAI	3.5844	1.11627	0.474	0.656
I like SAKAI particularly for course Power Points	3.6883	1.04201	0.347	0.680
I like SAKAI particularly for class videos and web-links	3.6623	1.02097	0.452	0.662
I like SAKAI particularly for course announcements	3.3766	1.20349	0.443	0.662
I prefer to interact with my instructor using Facebook the most	1.9740	.93152	0.160	0.708
I interacted frequently with my instructor on Facebook	1.7792	.85260	0.221	0.698
Submission of assignments on SAKAI is most convenient	3.4026	1.17271	0.366	0.677

With a sample size of 77 and 10 items in the questionnaire, the sample size criterion for PCA was met. Using a PCA for this study (Varimax Rotation and Kaiser Normalization), an identification was made for various statements that constituted a comparatively independent subset of content. Components were extracted based on Eigen values greater 1. The PCA methodology of analysis presupposes that a particular subset of latent variables, smaller in number than the initial number of statements, are responsible for and representative of the co-variation among the responses. To competently

analyze the components of students' perceptions on the media used for student-instructor and student - content interactions using the PCA, each component identified was carefully labelled based on the statements it embodies.

The Focus Group Discussion (FDG) served as a means of validating the interpretation of the PCA (quantitative). Out of the 77 students, 6 students were conveniently selected (2 males and 4 females) for a group discussion. The discussion centred on explanations of students' preferences for the various media of student-instructor interactions. The FGD guideline included the following thematic areas: preferences for online interaction forms, predilections of face-to-face interaction with an instructor; experience with Sakai, the online course management system and experiences with the use of Facebook to interact with the instructor. The FGD was tape-recorded and later transcribed. The analysis was attentive to common efforts and to what was being achieved in sequential conversations in order to comprehend commonalities and contrasts in the responses. This was especially during the coding of discussion content.

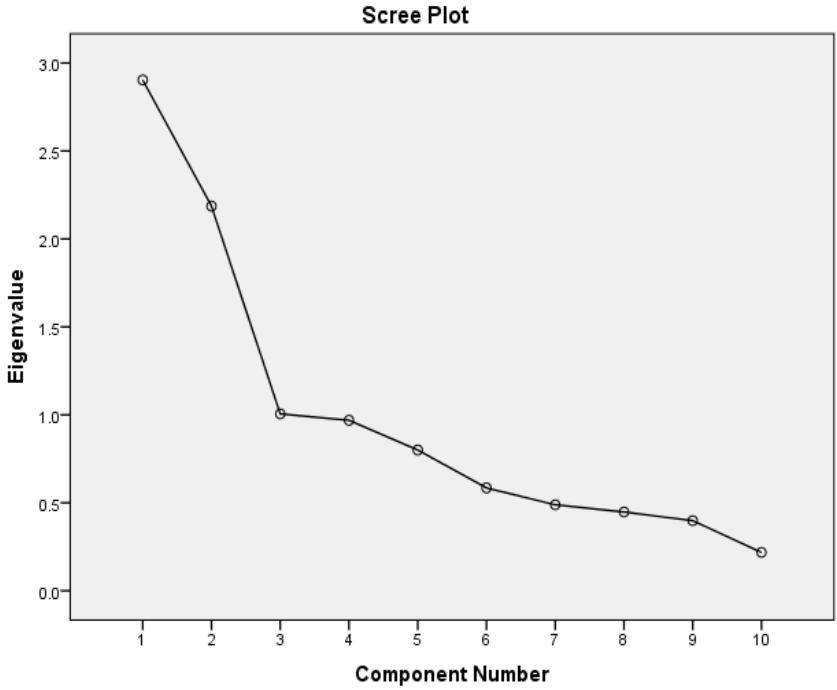
It explored patterns in the data, attempted to elucidate such patterns, and sought to explicate disagreements while avoiding being heartened with the demonstrations of themes that arose in the discussions (Frankland & Bloor, 1999). This enabled the research team to "merge" the data, thereby, effectively interpreting the principal components of perception and preference for media used in student-instructor interactions.

Ultimately, 10 statements in the survey questionnaire were used to assess what constitutes the perceptions/preferences of media for student-instructor interactions in a graduate (postgraduate) Research Methods class. The reliability analysis conducted yielded a Cronbach α value of 0.700, suggesting that all the statements reliably measure preference and perception of media for student-instructor interactions. Table 2 above presents the descriptive statistics and the reliability analysis for each of the survey questionnaire items used to explore student-instructor interactions. The correlation matrix did not show that the items of the survey were highly correlated, and the Kaiser-Meyer-Olkin Measure of Sampling Adequacy was 0.691 ($p = 0.000$).

From the scree plot (Figure 1), it is clear that three components had eigenvalues greater than 1. That is, the relative contribution of the questionnaire items to the total variance is distributed among three factors. The mapping of the response items to a component is indicated in Table 3 below. The three components accounted for 60.9% of the total variance (Table 4). The components are categorized into the following themes: (1)

perceived utility of the course management system and the ease of its use; (2) perceived importance of social media and convenient access to the instructor(s); and (3) perceived efficacy of the role of course multi-media and the timely receipt of the course information.

Figure 1: PCA Scree Plot of Students Preferences- for Student Instructor Interactions



The Principal Component Analysis yielded three components shown the Table 2 as PC1, PC2 and PC3. Table 3 provides the statement descriptors of the three components yielded by the PCA analysis.

Table 3.
PCA Matrix for Student Preferences for Mediums of Student- Instructor Interactions

Survey Item	*Components*		
	PC 1	*PC 2*	*PC 3*
I like all the features on SAKAI	0.851		
I like SAKAI particularly for course Power Points	0.801		
SAKAI (online course management system) is easy to use	0.783		
Submission of assignments on SAKAI is most convenient	0.504		
I interacted frequently with my instructor on Facebook		0.768	
I prefer to interact with my instructor using Facebook the most		0.754	
I prefer the online office hours the most		0.645	
I often used the online office hours		0.600	
I like SAKAI particularly for course announcements			0.830
I like SAKAI particularly for class videos and web-links			0.716

Table 4.
Principal Components, Descriptors and Themes of Student Perceptions Student-Instructor Interactions.

Component	*% of Variance*	*Statement Descriptors*
1	24.6	Perceived utility of course management system and ease of use
2	20.6	Perceived importance of social media and convenient access to instructor
3	15.7	Perceived efficacy of the role of course multi-media and timely receipt of course information

Qualitative Results and Discussion

Role of a course management system in promoting inclusive teaching and learning

Students assessed their preferences and thoughts on media for student-instructor, student –student and student-content interactions based on the utility of learning management systems, accounting for 24.6% of the variance. The students' perception of Sakai was examined through their adoration of the learning management system, use of the system for accessing course materials, and the ease of use of the system in general. Students who liked all the features of Sakai, liked it for being able to gain access to their courses in PowerPoint format. They deemed Sakai's interface and features as easy to use, and convenient for submitting assignments. It was found to be an important tool for student-instructor interaction. A female FGD participant stated: "…so Sakai gives us the opportunity to see exactly what the lecturer wants to teach throughout the semester. It gives you an opportunity to also interact with the lecturer…you can send messages to [the lecturer]."

It was also realized that the participants of the study preferred Sakai because of its ability to have lecture PowerPoint slides posted on it. This is a further testament to instructors of the potential benefits of using course management systems, bearing in mind that course management systems provide easy access to PowerPoint slides (Worthington & Levasseur, 2015). Students have been expressing their desire and liking for this course presentation format because it helps them to compile complete course notes (Ahmadi et al., 2007). A female participant in the focus group discussion added:

> I think Sakai is the best thing that the university has ever implemented. I believe that we have progressed from the age where… we focused on doing paperwork and not using computers. Right now, with the advent of communication [ICT] here via the social network, everything is so much easier. When the lecturer finishes teaching, she/he just posts everything on Sakai… and even before he leaves the lecture theatre everything needed is there You have all the [PowerPoint] slides that you are supposed to get to help you with your work [learning]. I think that it is a good initiative.

Although Sakai is clearly the intermediary between the instructor and students, the study participants acceded to the careful and thoughtful consideration of the instructor to use the system to communicate and transmit

course material. Sakai is a great system for student-content interaction, but it requires a thoughtful configuration and content submission by an instructor (Brown, 2016). This is strong evidence of Hassini's (2006) claim that instructors are the connection between students and knowledge. Further, the study's findings are in consonance with Marks et al', (2005) contention that instructors need to assist students with a masterful incorporation of course content, which is the key to getting students to actively participate in the online learning environment. Therefore, the instructor's role in orienting students on the features of the course management system is invaluable.

Irrespective of the obvious utility of Sakai, as expressed by the study participants, and the reference to it as a great innovation by the university, the implementation of the course management system had its own challenges. These challenges were more of a "contextual factor". Notable among these problems were poor internet connectivity and the erratic electricity supply at the time of the study. These are common problems in most parts of Africa (Tshabala et al., 2014). During the FGD, a female student noted:

> At times it is so difficult getting access to it [(Sakai)]. You [attempt] to login in and you receive a response that [there is] no [internet] connection. Because…maybe the internet is not active or the [Sakai] server is not active for you to use. This s makes it uncomfortable to use at times.

Our findings suggest that the use of learning management systems in the Ghanaian context may be preferred by students and may be promoted in different educational departments when they appreciate its utility and its use is made easy and convenient. With continual improvements in the internet infrastructure at the university, ICT undoubtedly will become pervasive in various courses. It is also noted that besides providing basic information on the use of the learning management systems, Sakai has tools for communication and collaboration which enhance collaborative learning. It also has tools for creating and managing announcements, calendars, chats, emails, discussions and messages that promote inclusive teaching and learning which are the foundation of inclusive education.

Additionally, the tools for assessment, collecting student submissions, grading, providing rich feedback, online quizzes which provide immediate feedback, grade entry capabilities and grade books all make Sakai the golden ICT tool to promote effective teaching and learning. Therefore, Sakai would promote inclusive education in developing countries if applied judiciously. As a tool for planning the development and delivery of quality

education to men and women, boys and girls but chiefly to graduate students in Ghanaian universities –who are the focus for this study –Sakai's capabilities as a learning management system that is used to create and organize content, resources, quizzes, assignments, links, video uploads, storage and sharing of files makes Sakai the right educational resource for planning and for leading change in how education is conducted in developing countries like Ghana. This ICT tool would ensure that teaching and learning become inclusive and would promote the attainment of equitable quality education and life-long learning opportunities for all.

Importance of Social Media in Promoting Better Planning and Change in Education Delivery

The main pedagogical activities the study focused on were the use of social media to engage in course group discussions, carry out course work assignments, and contact lecturers for clarifications of concepts and to communicate with colleagues to share and exchange information. In the data, students with a higher preference for social media and web-based office hours were more optimistic about the role of social media in promoting student-instructor interactions. The importance of social media and web-based office hours for student-instructor interactions were assessed based on the following: actual frequent interaction with an instructor using Facebook, preference in communicating with the instructor using Facebook, the use of online office hours, and preference in the use of online office hours.

Students who interacted with the instructor on Facebook, and who preferred to communicate with the instructor using Facebook, perceived Facebook as a helpful medium for knowledge dissemination and for gaining familiarity with the instructor. Our findings confirm Asterhan and Rosenberg's (2015) conclusion that Facebook is a great means of promoting student-instructor collaborations and provides appropriate classroom moods. Furthermore, in view of Facebook's ability to encourage instructors to know their students on a personal level, students' interest in a particular class were seemingly enhanced (Akcaoglu & Bowman, 2016). Students who used and preferred online office hours emphasized that convenience and flexibility were their main reasons for preferring to use Sakai over offline media. Students had the option of communicating with an instructor via his official email, using the discussion board feature on Sakai or on Facebook. These options gave students a lot of flexibility in terms of location and time. A couple of female students who took part in the FGD noted: "I prefer the online office hours... This is because with the online office hours, you are not limited by time or venue."

> I prefer the online office hours… because there are times that my supervisor or instructor might be busy so there might not be time for us to meet in person to trash out issues or discuss pertinent issues. But if we are always meeting online then whether your [instructors] are busy or not we are able to communicate and then I can keep on doing my work.

The Role of Social Media in Planning for Change in Teaching and Learning

Social media platforms, like any other ICT tool in education, have many advantages. Some of these advantages include helping students with their research work, communication purposes, sharing of information and helping them use their multiple senses. The following are statements made by two respondents supporting this claim:

> **Respondent I**:
> I want to say that when it comes to pedagogy, one makes use of a lot of the senses: hearing and seeing as you sit down relaxed to watch a video on Facebook or other social media [platforms] can really teach you and help one learn something new. Thus, social media promotes the understanding of new concepts taught.

> **Respondent 2**:
> Social media has more advantages [for] the senses that basically help us to know more about a subject matter… it also helps us to share information on platforms like Sakai. We use social media like Facebook when Sakai shuts down or fails to respond. We [also] share schedules of lectures and quizzes. So basically it helps one to get more information about what is going on and promotes collaborative learning.

This finding is consistent with the literature. Email has been used as a substitute for face-to-face office hours (Atamian & DeMoville, 1998) because it is an additional means of communication and has become a major supplement for other forms of communication (Hassini, 2006). Furthermore, it augments the learning experiences of students while being a crucial channel of feedback for improvement of future courses for instructors (Hassini, 2006).

It must be noted, however, that the preference for online office hours was not absolute. Some students indicated that while the online office hours is preferred and used, they also use the face-to-face office hours to seek clarity

on certain topics and quantitative questions that are not easily explained or understood through online means. The following are a couple of quotes from a male and a female student respectively:

> I like face to face interaction because during that interaction…you…make meaning of the person's gestures, posture, and facial expressions, which is more important in getting feedback in every communication. So to me, I prefer face to face interactions and there are some issues that are more sensitive…we cannot talk [about them] on the phone or on the internet. So to me, I prefer… face-to-face interactions and it is much clearer to me. It gets me much more information from my instructor. There are certain things you cannot do online, especially if it is, maybe, quantitative kind of work or something that deals with figures. The lecturer has to look at [the problem]. You cannot do those things online. When it's face-to-face, the lecturer gives you a reason… why you are on track or why you aren't on track. You're better able to do things properly and in a relaxed manner. No pressure.

Efficacy of the Role of Multi-Media Courses in Planning and Change in Education Delivery

The use of videos and web-links for teaching are not popular in Ghanaian universities. Nonetheless, we included them in this course. The main items that constitute this component are students' preference for course announcements, and instructional videos and web-links placed on the course management system. Students who preferred the uploading of instructional videos and the sending of course announcements via Sakai were positive about how that impacts their interaction with their instructor. Although these videos and announcements formed course content, students perceived vital communication material as essential for their academic success. This is a clear illustration of the claims that students' perceptions of the need for ICT to achieve their learning outcomes influence their use of it (Wozney et al., 2006). Also, instructional videos positively impact student satisfaction in online learning environments. A couple of female study participants confirmed this stance by stating the following:

> Also, I think it [online tool] is interactive... how should I put it? He [the lecturer] would put some videos for us to watch concerning a

topic that he is teaching us. It makes the whole learning process very interactive and interesting.

The aspect of us [students] getting access to videos and materials also is very good… even if you [students] are absent for lectures, you are sure your notes are intact, and you don't go to get someone's notes… [with] so many mistakes and you have to struggle to understand what they are trying to say.

Above observations support findings by (Boateng, 2020; Asamoah, 2020; Aljawarneh, 2019; Kraleva, Sabani, & Kralev, 2019; and Chickering & Ehrmann's (1987) that, new communication and information technologies have become major resources for teaching and learning in higher education and that, if the power of the new technologies is to be fully realized, technologies should be employed in ways consistent with the Seven Principles. This study has underscored the immense benefits of using Learning Managements Systems and the tools available within such systems to transform teaching and learning at the University of Ghana. Not only this but that the SAKAI Learning Management System has also challenged instructors to move beyond using SAKAI just to store course content but instead to explore other innovative ways to employ the Learning Management System to improve teaching and learning at Ghana.

CONCLUSION AND RECOMMENDATIONS

We have examined the constituents of students' perceptions and preferences on the media for student-instructor interactions. Although, developing countries like Ghana are now vigorously making the effort to engage students with ICT and incorporate it into teaching and learning, the use of ICT for educational purposes has been in existence for over three decades. Such efforts have been bedevilled by inadequate funding for computer and internet infrastructure, students' lack of access to computers and their lack of computer proficiencies, computer ineptness on the part of instructors, and inadequate professional development among other issues.

We took advantage of the University of Ghana's current robust ICT infrastructure to assess students' perceptions of media for student-instructor interactions. In a graduate Research Methods class, Sakai, email and Facebook were used as media for communication. A survey questionnaire and focus group discussion were used to elicit data for the study. After conducting a reliability analysis to ascertain the internal consistency of our

survey instruments, a Principal Component Analysis was run. Three main themes emerged as constituents of students' perception and preference for student-instructor interaction media. These were (1) the perceived utility of course management systems and their ease of use; (2) the perceived importance of social media and convenient access to the instructor; and (3) the perceived efficacy of the role of multi-media courses and the timely receipt of course information.

It is concluded, therefore, that the learning management system, Sakai, is a useful intermediary between instructors and students. It is highly recommended because of its ability to store content and how easy it is to use. When course contents are thoughtfully designed and student capabilities are enabled, the learning gap created by the digital divide is reduced.

While social media (e.g. WhatsApp and Facebook) are widely used in Ghana for non-educational purposes, it can be concluded that there may be a real utility in the use of Facebook for academic purposes. This provides, among other things, an additional channel of communication, thus supplementing the traditional methods of communication –emails and face-to-face tutorials. Students in our study also enjoyed the other channel of communication which was created for office hours interactions. Instructors may consider using this social media platform on the University of Ghana's campus.

Finally, students expressed positive attitudes toward course announcements, and instructional videos and web-links. Such announcements serve crucial reminders for students regarding assignment due dates, guest lecturer schedules, and test and examination schedules. This makes students feel that they are in constant touch with their professor. We believe that an optimal interplay of ICT and face-to-face instructions in a blended course environment in Ghana will serve students very well.

Planning for Change to influence Student-Student Interactions

The student-to-student interaction (social interactions) happen between two learners or among a group of learners studying the same course. This can happen with or without the intermediary of the instructor. Social interaction plays a key role in how students learn. It is therefore something that must not be ignored. This study has found that the interaction between learners leads to greater learning and high course satisfaction. This is so because students are motivated to learn when they find themselves in a group. They do not feel isolated and they benefit from collaborative learning as they receive feedback from peers.

In planning to influence student-to-student interactions in courses and disciplines taught in tertiary, and all levels of education, student collaborations and information sharing should be required. There is the need for course planners and instructional technologists to build a sense of community among fellow students taking a course. It is not enough to just encourage students to share their insights. Instructors and instructional designers must create a learning atmosphere where students can participate, offer responses, draw effective feedback and communicate in short, focused messages. This approach promotes powerful relationship-building among students and allows them to better understand the materials which have been put up for use. The use of tools in the Sakai learning management system (discussion boards, emails, chat rooms, and other social communication tools) encourages learners to discuss their interests and enables instructors to interact more effectively with their students via scheduled chat sessions or fora sessions. By discussing topical issues, student-to-student interactions are enhanced. Effective policies which are implemented to appropriately incentivize instructors will motivate them to go the extra mile in ensuring that the right things are done and the quality of education is assured.

Planning for Change to Influence Student-Instructor Interactions

The student-to-instructor interactions happen when the instructor delivers information, provides feedback or simply encourages or guides the learner. It also takes place when a learner asks the instructor questions or communicates with him or her regarding the course. In this type of interaction, the instructor serves as a guide, facilitator, an expert or support depending on the situation. Students thrive academically when instructors are present throughout the course to provide feedback and guidance to them. This is essential because it ensures that instructors clarify issues, reinforce crucial points and correct interpretations of subject matters, and stimulate interests and motivations.
The planning for change to influence student-instructor interactions should be preceded by:

- Increasing dialogue between the instructor and students by offering several different ways for them to contact the instructor. For example, by providing e-mail addresses, social media accounts and office phone numbers of instructors to students, students would always be able to contact the instructor;
- Monitoring the students' course performance and participation;
- Offering prompt feedback by responding to students as soon as possible, often within the confines of 24 hours; and

- Providing clear and detailed information to the students every step of the way so that students can feel the support and presence of the instructor during the course.

Planning for Change to Influence Student-Content Interactions

Student-content interactions take place when students, by themselves, directly obtain information from learning materials. This occurs when students interact with the text and are deeply engrossed with the content. Student–content interactions have been considered to be one of the most crucial forms of interaction because it is where true learning takes place. Once students access learning materials, such as multimedia, PowerPoint slides, reading materials, audio and video materials among other resources, they should be able to consume such materials in their own way by pausing, rewinding, repeating and forwarding parts of the course to master it.

The planning for change to influence student-content interaction should entail instituting policies and mechanisms that give students options on how they want to consume content. University authorities and faculty should offer content in different formats including texts, audio and video. Students should be given breaks or quizzes to check for understanding. Also, school authorities and faculty members should make sure that materials can be read easily on the screen or can be printed. Moreover, faculty members and instructors must create challenging tasks that require students to interact with the content and explore topics in order for deep understanding and learning to take place.

Implications for Ghana's Achievement of Sustainable Development Goal 4

This study has shown that there is the need for strong policies which support the use of ICT in Ghanaian Tertiary Education. These policies, however, may need to extend to all environments where education is pursued to promote inclusive education as prescribed by the SDG 4 and its targets. This paper has informed and borne implications for the development of new policies to promote proactive, inclusive and equitable education for all. There is a need for national policies to address the issues of access to computers and ICT devices by all who need to receive high quality, inclusive and equitable education. Discrimination should not be made on account of disabilities, geography, gender, ethnicity, race, faith or social status. The SDG4 is about ensuring inclusive and equitable education and promoting lifelong learning opportunities for all. The ways through which this study helps to ensure the fulfilment of this aim include the following:

- The use of ICT tools and social media like Sakai and Facebook respectively, emphasize and promote gender equality in education. Equality in education promotes collaborative learning among both sexes and among people with diverse backgrounds. In the end, relevant and effective learning outcomes are achieved in learners regardless of their gender and age. (Target 4.1).
- The findings from the paper promote the planning for change – that of a national benchmark- in the use of ICT devices for effective inclusive teaching and learning.
- The findings promote planning for the attainment of equal access to affordable ICT devices and the use of ICT media at the different levels of education. SDG targets 4.1, 4.3 and 4.5 call for the elimination of gender disparities but promote the inclusion of people living with disabilities, indigenous peoples and children in vulnerable situations among others. This paper has brought to light that learners of diverse backgrounds must acquire the relevant knowledge and skills to promote sustainable development and sustainable lifestyles, human rights, gender equality, promotion of peaceful and non-violent cultures global citizenship and appreciation of cultural diversity (e.g. through collaborative learning) and culture's contribution to sustainable development and completion of tertiary education (SDG 4.1; SDG 4.7).

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REFERENCES

Abrami, P. C., Bernard, R. M., Bures, E. M., Borokhovski, E., & Tamim, R. M. (2012). Interaction in distance education and online learning: Using evidence and theory to improve practice. In *The next generation of distance educatio*n (pp. 49-69). Springer.

Admiraal, W. F., Lockhorst, D., Wubbels, T., Korthagen, F. A., & Veen, W. (1998). Computer-mediated communication environments in teacher education: computer conferencing and the supervision of student teachers. *Learning Environments Research, 1*(1), 59-74.

Ahmadi, M., Dileepan, P., & Raiszadeh, F. (2007). Is PowerPoint evil? Students' perceptions. *Review of Business Research, 7*(4), 15-19.

Akcaoglu, M., Bowman, N.D. (2016). Using instructor-led Facebook groups to enhance students' perceptions of course content, *Computers in Human Behavior, Vol. 65* (1), pp. 582-590, https://doi.org/10.1016/j.chb.2016.05.029.

Alexandron, G., Wiltrout, M.E., Berg, A. and Ruipérez-Valiente, J.A., 2020, March. Assessment that matters: Balancing reliability and learner-centered pedagogy in MOOC assessment. In Proceedings of the Tenth International Conference on Learning Analytic & Knowledge (pp. 512-517).

Aljawarneh, S. A. (2019). Reviewing and exploring innovative ubiquitous learning tools in higher education. *Journal of Computing in Higher Education*, 1-17.

Asamoah, M. K. 2020. "Reflections and Refractions on Sakai/Moodle Learning Management System in Developing Countries: A Case of Ghanaian Universities' Demand and Supply Perspective Analyses." African Journal of Science, *Technology, Innovation and Development 12* (2): 243–259. https://doi.org/10.1080/20421338.2019.1634318.

Asampana, Isaac, Albert Akanlisikum Akanferi, and James Ami-Narh. 2017. "Reasons for Poor Acceptance of Web-based Learning Using an LMS and VLE in Ghana." *Interdisciplinary Journal of Information, Knowledge & Management 12* (1) pp189–208. https://doi.org/10.28945/3742.

Asterhan, CSC, Rosenberg, H. (2015). The promise, reality and dilemmas of secondary school teacher–student interactions in Facebook: The teacher perspective. *Computers & Education 85* (1) 134-148.

Battalio, J. (2007). Interaction online: A reevaluation. *Quarterly Review of Distance Education, 8* (4), 339.

Bernard, R. M., Abrami, P. C., Borokhovski, E., Wade, C. A., Tamim, R. M., Surkes, M. A., & Bethel, E. C. (2009). A meta-analysis of three types of interaction treatments in distance education. *Review of Educational research, 79* (3), 1243-1289.

Boateng J.K. (2020). "Using SAKAI LMS for Enhanced Instructor-Student Interactions and Effective Student Learning: Perceptions of Students from the University of Ghana." *Ubiquitous Learning: An International Journal Volume 13* (4), pp. 1-10. doi:10.18848/1835-9795/CGP/v13i04/1-10.

Brown, M. G. (2016). Blended instructional practice: A review of the empirical literature on instructors' adoption and use of online tools in face-to-face teaching. *The Internet and Higher Education, 31* (1), 1-10.

Chen, P. S. D., Lambert, A. D., & Guidry, K. R. (2010). Engaging online learners: The impact of Web-based learning technology on college student engagement. *Computers & Education, 54* (4), 1222-1232.

Chickering, A. W., & Gammon, Z. F. (1987). Seven Principles for Good Practice in Undergraduate Education. *The Wingspread Journal, 9* (1), 1-10.

Dias, S. B., & Denis, J. A. (2014). Towards an enhanced learning management system for blended learning in higher education incorporating distinct learners' profiles. *Educational Technology & Society, 17* (1) pp. 307–319

Essel, Daniel Danso, and Osafo Apeanti Wilson. 2017. “Factors Affecting University Students’ Use of Moodle: An Empirical Study Based on TAM.” *International Journal of Information and Communication Technology Education 13* (1): 14–26. https://doi.org/10.4018/IJICTE.2017010102.

Ferreira, A., & Santoso, A. (2008). Do students’ perceptions matter? A study of the effect of students’ perceptions on academic performance. *Accounting & Finance, 48*(2), 209-231.

Fletcher, J.D., Tobias, S., & Wisher, R. (2007). Learning anytime, anywhere: Advanced distributed learning and the changing face of education. *Educational Research, 36*(2), 96-102.

Frankland J. Bloor M. (1999) Some issues arising in the systematic analysis of focus group materials. In: Barbour R. Kitzinger J (eds), *Researching with focus groups.* Sage.

Gillett-Swan J. (2017). The challenges of online learning: Supporting and engaging the isolated learner. *Journal of Learning Design, 10* (1), pp. 20-30

Guerrero-Roldán, A.E., Noguera, I. (2018). A model for aligning assessment with competences and learning activities in online courses. *The Internet and Higher Education, 38*, pp. 36-46

Hong, K. S., Lai, K. W., & Holton, D. (2003). Students’ satisfaction and perceived learning with a web-based course. *Educational Technology & Society, 6*(1), 116-124.

Hong, K. S. (2002). Relationships between students' and instructional variables with satisfaction and learning from a Web-based course. *The Internet and Higher Education, 5* (3), 267-281.

Ismail, K. (2017, November 13). CMS Wire. [Online] Retrieved from cmswire.com: https://www.cmswire.com/digital-workplace/what-is-a-learning-management-system/

Kipkurui, N., Wanyembi, P. G., & Ikoha, A. (2014). Evaluating Usability of E-Learning Systems in Universities. *International Journal of Advanced Computer Science and Applications, 5* (8).

Kraleva, R.S., Sabani, M. & Kralev, V. (2019). An analysis of some learning management systems. *International Journal of Advanced Science Engineering and Information, 9* (4), pp 1190-1198.Doi: 18.18517/ijaseit.9.4.9437

Kravik R, Caruso J (2005) ECAR study of students and information technology 2005: convenience, connection, control and learning. Educause Center for Applied Research. Educause

Kuo, Y. C., Walker, A. E., Schroder, K. E., & Belland, B. R. (2014). Interaction, Internet self-efficacy, and self-regulated learning as predictors of student satisfaction in online education courses. *The Internet and Higher Education, 20* (1), pp. 35-50.

Martin, F. Bolliger, D.U. (2018). Engagement matters: Student perceptions on the importance of engagement strategies in the online learning environment, *Online Learning, 22* (1) (2018), pp. 205-222

Martin, F. Ritzhaupt, A., Kumar, S. & Budhrani, K. (2019). Award winning faculty online teaching practices: Course design, assessment and evaluation and facilitation. *The Internet and Higher Education, 12* (1) pp. 34-43. Issn1096-7516. https://doi.org/10.1016/j.iheduc,2019.04.001

Martin, F. Wang, A. Sadaf, A. (2018). Student perception of helpfulness of facilitation strategies that enhance instructor presence, connectedness, engagement and learning in online courses. *The Internet and Higher Education, 37* (1), pp. 52-65.

McNulty, N. (2016, June). Mobile Learning in Africa: How mobile educational technology benefits learners. Retrieved on 27th September 2019 from: https://www.niallmcnulty.com/2016/06/mobile-learning-in-africa-how-mobile-educational-technology-benefits-learners/

Moore, M. (1989). Three types of interaction; The American Journal of Distance Education. Technology enhanced teaching and learning in South African higher education–A rearview of a 20 year journey. *British Journal of Educational Technology, 47*(5), 843-858.

Ng'ambi, D., Brown, C., Bozalek, V., Gachago, D., & Wood, D. (2016). Technology enhanced teaching and learning in South African higher education–A rearview of a 20 year journey. *British Journal of Educational Technology, 47* (5), pp. 843-858.

Norberg, A., Dziuban, C. D., & Moskal, P. D. (2011). A time-based blended learning model. On the Horizon, 19(3), 207-216.Reid, P. (2014). Categories for barriers to adoption of instructional technologies. *Education and Information Technologies, 19* (2), 383-407.

Pappas C (2020, September). The best learning management systems (2020 updates). Retrieved on 30th December 2020 from:https://elearningindustry.com/the-best-learning-management-systems-top-list

Pomerantz, J., Brown, M. & Brooks, D.C. (2018, January). Foundations for a Next Generation Digital Learning Environment: Faculty, Students, and the LMS. Research report. ECAR.

Reid, P. (2014). Categories for barriers to adoption of instructional technologies. *Education and Information Technologies, 19* (2), 383-407.

Seaman, J.E, Allen, I. E., Seaman, J. (2018). Grade increase: Tracking distance education in the United States Babson Survey Research Group

Sher, A. (2009). Assessing the relationship of student-instructor and student-student interaction to student learning and satisfaction in web-based online learning environment. *Journal of Interactive Online Learning, 8* (2), 102-120.

Shimoni R., Barrington G., Wilde R., Henwood S. (2013). Addressing the needs of diverse distributed students. *International Review of Research in Open and Distance Learning, 14* (1), 134–15

Tshabalala, M., Ndeya-Ndereya, C., & van der Merwe, T. (2014). Implementing Blended Learning at a Developing University: Obstacles in the Way. *Electronic Journal of e- Learning, 12* (1), 101-110.

Willems, J., & Bateman, D. (2013). Facing up to it: blending formal and informal

learning opportunities in higher education contexts. Using network and mobile technology to bridge formal and informal learning, 93-118.
Worthington, D. L., & Levasseur, D. G. (2015). To provide or not to provide course PowerPoint slides? The impact of instructor-provided slides upon student attendance and performance. *Computers & Education, 85* (1), pp. 14-22.
Wozney, L., Venkatesh, V., & Abrami, P. C. (2006). Implementing computer technologies: Teachers' perceptions and practices. *Journal of Technology and teacher education, 14* (1), 173.

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