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Students' Classroom Use of Information and Communication Technologies: Implication on their Digital Literacy Skills in Tanzanian Universities

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Abstract

The current literature does not adequately account for the best ICT use practices and graduates' digital literacy skills the Tanzania's school system embrace. This paper provides some evidence about the academic use of ICT for learning and its implication on the level of digital literacy skills among students at University of Dar es Salaam (UDSM) and Sokoine University of Agriculture (SUA) in Tanzania. The paper is a product of a typical qualitative study carried out to assess University's ICT environment for students' learning. The study used a multistage sampling approach to select a total of 654 students from undergraduate programmes in the selected Universities. Data was collected by using Questionnaires, Documentary review and Focus Group Discussions and analysed by using descriptive, thematic and contents analyses. The findings indicated that, students struggle to use ICTs for learning and their work outputs manifest some weaknesses which suggest a low level of digital literacy skills for learning. The highlights that, unless universities amplify their support for digital literacy skills among students and instructors, the use of ICTs for learning will be a cause of students' disengagement in learning.

Key Words: Actual ICT use, Digital literacy Skills, Pedagogical support

Introduction

The trend of market-demands forms a long term driver for ICT adoption for which institutions must prepare digitally focused graduates and align their degrees with needs of the industry (UNESCO, 2018). Certainly, Higher Education Institutions have to adapt, design and custom-fit the Open Educational Resources (OERs), ICT tools and resources to their needs (Becker et al., 2018; 2017). Higher Education Institutions (HEIs) increasingly subscribe to strategies which merge ICTs with pedagogies. This makes it compulsory to address such pedagogical shifts and particularly ensure that learners learn efficiently and become quality graduates (UNESCO, 2018). Universities, in particular, are challenged to intensify efforts to support students' learning and participation in the 21st Century society (PwC, 2018; Becker et al., 2018; 2017). Given the growing international and commercial nature of university sector (Green, 2002), its multiplier effect to the economies makes it a strategic agency to develop 'digitally-literate' graduates and manifest a post-modern education system (Kuhl et al., 2019). Indeed, this direction is also a compliance with UNESCO's framework for digital literacy and recommendations to promote digitally literate learners in the school system (UNESCO, 2018).

The United Nation (UN) backs up ICT and digital literacy in particular as strategies to accelerate the attainment of Sustainable Development Goal 4 targets (4.1, 4.4 and 4.7) for participation (access), quality and efficiency (World Education Forum-WEF, 2015). This seems to make a lot of sense as universities globally have shown interest with ICTs, and its connection to the cited SDG targets has become a common expression. Informed by an African context, African Union's (AU) Agenda 2063 and the Djibouti Conference (2017) revitalized the desire to strengthen ICT transformative capacity of HEIs (UNESCO, 2017). Specific to Tanzania, the ICT policies and Vision 2025 highlight the expectations that, digital literacy is a crucial determinant lifelong learning and 21stC labor force (Ministry of Finance and Planning, 2016; Ministry of Communication and Transport, 2016). Impliedly, students cannot achieve the expected outcomes of ICT use without a better understanding of the academic use of ICTs.

Besides the attempts to advance ICT infrastructure and promote ICT supported pedagogies in Tanzanian universities (Barakabitze et al., 2019; Mtebe & Raphael, 2018), more focused perspectives indicate some efforts to make a more defined framework for ICT use. For instance, the Tanzania's Commission for Universities-TCU (2022) developed some guidelines for universities to implement online and blended learning strategies. Certainly, the guidelines seek to promote maximum participation of students in ICT supported learning practices. The objectives of the paper was therefore to explore the actual technology supported learning practices among students and; establish instructors' perspective on students' participation in ICT supported learning at two giant universities in Tanzania, namely Sokoine University of Agriculture (SUA) and University of Dar es Salaam (UDSM). The universities reflect some typical attributes about age, size, history and involvement in ICT activities which define their leading role among other universities in Tanzania.

Review of related Literatures

A wide range of literature seems to indicate a general consensus that, prioritization of students' skills to use ICTs is one of sustainable models of teaching and learning in ICT environment (Wiegel,

2020; Shopova, 2014). Kuhl et al. (2019) posit that, technology use policies and pedagogies should be designed to develop learner agency in students. Specifically, university instructors' should design teaching activities where learners make the desired use of technology for learning (Wiegel, 2020). The global impression indicates that, the academic use of ICTs among students is a serious challenge, such that, digitally illiterate students are disadvantaged in learning. Although the curriculum practices already seem to be computer-skills based globally, the support on students' proper academic use of the technology is still limited (Michel et al., 2018; Secker, 2017). Therefore, students in many universities are likely to continue making the academically unacceptable use of ICTs. For instance, besides the Massive Open Online Courses initiatives in North America, Europe and majority of Asian countries, Handley (2018) recommends for universities to ensure instructors' capacity to support students' digital literacy for learning.

The current review has shown further that, majority of students in SSA have poor technology background. Their first time use of computers at the university presents a lot of inconveniences in the related ICT use for learning (Byungura et al., 2018). The current literature does not offer adequate evidence on how students with such mixed up backgrounds in the context of Tanzania use the technology for learning. Elsewhere, students' unguided use of technology in learning has serious compromise on their relationship with instructors and the learning outcomes (Wiegel, 2020). Some students are likely to be upset by instructors' technology use which is different from theirs (Schmidt, 2012). The digitally illiterate students are also likely to do poorly in their academics because of inability to operate ICT devices, use contents ethically, evaluate, communicate information and protect personal data and privacy (Michel, Lutz and Büchi, 2018; Shopova, 2014). This makes it a necessary requirement that students are trained to use the technology in a way that ensures authentic learning at the same time.

Scholars further recommend the value for classroom pedagogical practices that seek to mount students' digital literacy skills (Wiegel, 2020). Based on their teaching roles, Instructors can plan, facilitate and reinforce such practices as they deal with students' multiple-literacies in daily learning routines (McKnight et al., 2016). Nerland and Prøitz (2018) recommends for the design for student learning tasks to manifest a synergy for technology, teaching approaches and the contents. Further, Meyer et al. (2013) conceive that, instructors should be able to influence students' use of learning resources and the culture of collaboration. Therefore irrespective of the nature of technology in place, the arrangements and pedagogies attached to students' use of learning have influence on students' mastery of the technology use (Rahayu & Sapriati, 2018). The review therefore suggests the need to continuously monitor students' classroom experience and to ascertain the impacts that ICT related investments are making particularly on students' learning.

3.0 Methodology

A total of 653 students selected by using multistage sampling approaches completed questionnaires. A total of 16 FGDs with students were carried out (nine (9) at UDSM and seven (7) at SUA). Also, 114 instructors based in colleges/schools which offer undergraduate programmes completed the questionnaires. Ten (10) of the instructors who completed the questionnaires were also asked to participate in face-to-face interviews, (five (5) at SUA and five (5) others at UDSM). The selected instructors had classes for the semester during data collection. Further Interviews (with ICT

support personnel) were carried out to explore the perspective of didactic personnels on ICT use between instructors and students. The process of data analysis was informed by the Bereday's (1964) Systematic Areas comparative study approach, proceeding from case-specific to cross-cases analyses (Bray, Mark, and Thomas, 1995). As such, the findings and discussions reflect some similarities and differences between the selected universities in line with the major themes (Huberman and Miles, 2002).

Findings and Discussion

Patterns of ICT use among students at SUA and UDSM

Students were asked to rate the frequency at which they participated in a given list of ICT mediated learning activities (Figure 1 & 2) based on a 5-points Likert scale questionnaire items. In the closed ended item, 0 meant that one never engaged in the activity (0%); 1 rarely engaged in (up to 20%); 2 only sometimes engaged in (about 50%); 3 often engage in (about 70%) and 4 always performed the ICT mediated task (about 100%). Figure 1 (for SUA) and 2 (for UDSM) present the summary of descriptive data. The interpretation of the descriptive data is corroborated by verbal responses based on students' FGDs and interview with instructors who had some teaching loads with students who participated in the study.

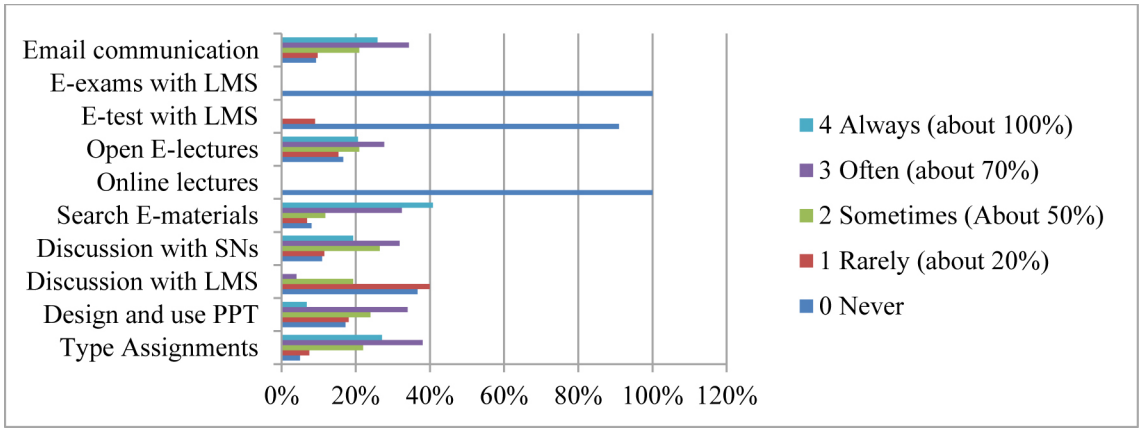

Figure 4.1: Pattern of ICT use for learning among Students at SUA
Source: Field data-SUA (2021)

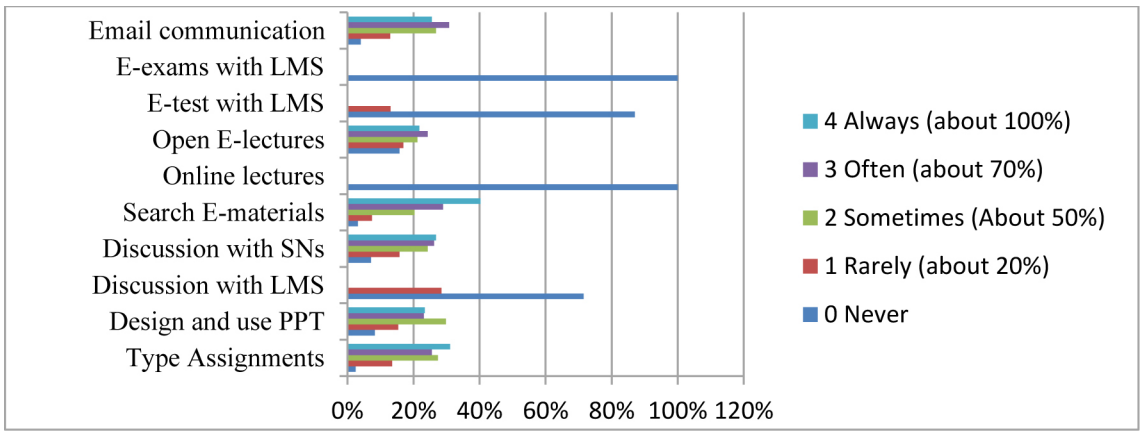

Figure 4.2 Pattern of ICT use for learning among Students at UDSM (N=325)
Source: Field data-UDSM (2021)

Typing of assignments and papers

Students' assignments in the context of Tanzanian universities take different forms. At both SUA and UDSM, they include individual assignment, where a student is given some project/questions to research on and write a paper as an individual or in groups (as determined by the instructor). The scores for these tasks normally to contribute to the final course work grades. While students are expected either to hand-write or computer-type these assignments, the current study noted that, majority of students now use computers to type their assignments. A student can write good paper (assignment) if she/he has adequate skills for computer basic operations and programmes such as word, excel among others. The earlier review by Mungwabi (2017) highlights that, students must also be able to identify material needs, use up-to-date strategies, evaluate, manage and integrate digital information to the available knowledge in order to engage successfully in digital learning.
Interviews with instructors to confirm students' tendency to type assignments noted a narrowing room for handwritten assignments with time. Majority of the interviewed instructors emphasize the necessity for students to computer-type assignments for submission. Instructors believe that neatly typed papers are adaptable, readable, have more accuracy and attract better comprehension of the materials: "*Sometimes I want my students to print their papers so that they (papers) can be easily used by others who may wish to do research on similar topic/question"* (Male instructor, College of Engineering-UDSM: March, 2021). "*I prefer my students to submit typed assignments so that I can read and easily understand" (*Female Instructor, Veterinary Medicines-SUA: Feb, 2021).

> *I can't read students' handwritten submissions! I don't entertain that in my class; In fact I want my students to submit soft copies via email because I may want them to further improve the same* (Male Instructor, Forestry-SUA. February, 2021).

The FGD with small groups of 1st year students indicated that, they sometimes tend not to type their assignments; first, because they think it needs much time and a lot of guidelines to type and format the work and; second, some instructors still accept both printed and handwritten submissions. For example, like several others, one stated that:

> "*Typing is a new experience that I have not trained adequately. I personally feel that, I better handwrite than type because I fear making mistakes!"* (Female 1st student-BSc. HN-SUA: February, 2021)

The FGDs with second and third year students indicated that, although they can type, some challenges like inability to type fast and multiplicity of deadlines for works make them either write poorly or seek some help from cyber operators who can type for them: "*Yes, I prefer typing and really wish I can have every assignment typed; but am too slow in typing"* (Female 2nd Year student-BSc. Forestry-SUA. February, 2021)

> *The fear to score low grades due to poor formatting makes us think outside the box [laughter]; when we have drafted the assignment report with the required materials available and everybody in the group is busy, we tend to ask cyber people we trust to type and organise the work. From that, we only need someone to proofread the work ready for printing (*Male 3rd Year Student.

BSc. AnHP-SUA. February, 2021).

The qualitative evidence also proved that, instructors do not take some concerns to know the challenges student encounter in relation to the quality of what is typed, which consequently compromise students' attempts to learn how to type and create better contents:

> *"We have instructors who never accept hand-written submissions; they rarely guide students on the better format to write papers because they believe students have taken a computer course. So students who don't have ability to format their papers tend to handwrite and ask the cyber café people for a help"* (Male 3rd student LLB-UDSM. March, 2021)

The review of students' typed papers found some common flaws which stem from lack of coherence of ideas, problems with punctuation, inconsistent font case and size, paragraph orientation and typos. The findings suggest that, majority of students' type assignments because of the pressure from instructors, but with little interest. On the other hand, despite the instructors' pressure on students, the attempts to ensure that students write typographical free papers are challenged by the instructors' heavy workloads, as posited by one instructor:

> "*We try our best, but with the burdensome teaching loads, we can only focus to mark and correct the content part of what students write"* (Male Instructor-BSc. AEA-SUA. February, 2021)

With regards to frequency of a particular activity, the descriptive data for SUA (Figure 1) show that, 17(5%) student respondents never typed their works, 24(7.5%) rarely did and 71(22%) did type sometimes. Other 122 (38%) and 87 (27.1%) often and always typed their works respectively. Out of 62 instructors, a total of 38 (62%) engaged students to type assignments between often and always. Otherwise, 1 (2%), 8 (13%) and 14 (22.6%) instructors never, rarely and sometimes engage students in the activity respectively. At UDSM (Figure 2), 8 (2.5%) student respondents never typed their works, 44 (13.5%) rarely did and 89 (27.4%) did type sometimes. Other 83 (25.5%) and 101(31.1%) often and always typed their works respectively.

Although students are subjected to type assignments and papers, there is still a room as some instructors still accepts handwritten submissions. The findings indicate likelihood that, the students' tendency to type assignments/notes is a result of instructors' frequency of engaging them. Despite the instructors' drive for students to type papers and assignments, majority of instructors do not have time to guide students to improve their typing associated skills. Moreover, as majority of instructors do not take time to reinforce best practices of typing assignment and papers, students' mastery of the associated skills is likely to take longer. This connects to Nalaila, Wawire & Gathara (2022) who noted some improvement on the ways students typed their papers between programmes as a result of some guidance from instructors.

E-tests and Examinations

The SUA's Examination Regulations and Guidelines (2019/2020) do not state for either semester university examinations or Continuous Assessment activities to be carried out on line (SUA, 2019). The current review observed some practices of continuous assessment activities like assignments,

tests, quizzes which can be taken via the Moodle Learning Management System (LMS). Some activities, however, like examinations are restricted to face-to-face mode based on the standards provided by Tanzania Commission for Universities. In the context where a university has clear policy structures to support these activities on line, students must possess various operational and informational requisites. Primarily, a student has to master computer basic operations and ways to navigate the relevant features of the LMS.

Further qualitative evidence based on interview with ICT support teams (at SUA and UDSM) confirmed a less use of LMS for tests, assignments and quizzes. This implies that both students and instructors are inconsistent users of the features of the technologies. Students in particular, are likely to take longer to develop the desired fluency with the technology features:

> *Of course some instructors administer online tests, especially cumulative test. We normally notice that when students come in numbers to request for passwords of their Moodle accounts! For example, there is one instructor, based in the College of Agriculture Sciences and Fisheries Technologies (COAF), who does number of activities online with his students* (Support personnel 1, UDSM. March, 2021).

> *Many instructors still perceive the LMS new and unfamiliar to them. Despite the awareness campaigns in place, only instructors and students for courses related with ICT (particularly those who are taking Informatics and Mathematics) have registered a relatively substantial use* (Support personnel 1 (SUA). March, 2021).

The descriptive responses in Figure 1 (for SUA) and Figure 2 (for UDSM) show that, 100% of student respondents in each university never did any online examination. However, up to 66% percent of the respondents at SUA have not done an online test, except 34% of the total who only did online tests rarely. Similarly, 269(83%) respondents at UDSM have not done an online test, except for 55 (17%) of the total who did it rarely. This suggests that, the universities do not have provision/conditions to dictate students' online tests.

The qualitative data based on interview with Support personnel 3 (UDSM) revealed that, any attempts to carry out online university examinations are restricted by standards set by Tanzania Commission for University (TCU). TCU is a body which oversees the conducts and operational standards of Universities:

> "*There are neither guidelines nor policy which prescribe the type of activities to be carried out on line: On-line examinations are restricted by TCU standards"* (Support Unit 3-UDSM-March, 2021).

The study observed that, majority of instructors do not schedule in advance the learning activities to be carried out online and those to be carried out by face-to-face. The tenet in this study highlights that, any shift to uncommon ICT supported modality has to be explicitly communicated to students. That will provide room for the students to make some time rehearsals with the technology options in place. In contrast, the technology will likely frustrate students' focus on contents/subject and consequently demotivate their focus to the technology-and-subject bond. Based on FGDs with

students at both universities, for example, a student at UDSM recalled that:

> *Some quizzes are paper based but others are carried out via the LMS. The problem is that, some teachers decide for the assignments to be taken on line when it's just time for it, such that students do not have time to prepare for it* (Female 3rd year student-BA. LIS-UDSM: March, 2021).

Portraying a similar experience at SUA, a student reiterated of one instructor who provided a test online when he was attending a workshop in Dar es Salaam City:

> *It is uncommon practice to do tests online; there has to be some serious reasons. The recent test conducted online was for a course by Dr. X [hidden identity], because we were in pressure to start the final University examinations and the instructor was attending a workshop in Dar es Salaam. The instructor had to arrange with the ICT unit whose staff came to guide us on how to do it* (Female 2nd Year student-BRD-SUA. February, 2021)

Findings from an informal discussion with instructors indicate some challenges to implement and manage online test because of the instructors' fear that students have limited mastery for the use of LMS, large number of students per class, limited support staff and number of connected computers. The following quotes denote some cautions by instructors' in both universities about the issues which challenge the attempts to engage students in on-line tests and examination:

> *It is tricky to arrange for a test online; although we hear that students are trained on the use of Moodle, it is unclear if all students have the capacity to make it. It is still unfair to move such activities on line unless one is sure that students can do it* (Male Instructor-Animal Sciences-SUA. February, 2021)

> *You really need to be dedicated; a number of students for the classes I teach is large to contain in the available computer labs; you need to have sufficient computers connected and adequate manpower to manage students distributed to more than one computer labs. Not everybody can organise that every time!* (Female Instructor, COAF-UDSM: March, 2021).
> *We have done some test online; instructors create groups that they could manage in the available computer labs. When others are doing a test in computer lab, others must be locked up somewhere in one of the classes* (Female 3rd Year student: BSc. Ed -SUA: February, 2021).

Open online lectures and tutorials

Open online lecture and tutorial resources in form of a video can be used by students in addition to the basic learning materials prescribed for teaching. Such materials may be used to reinforce the taught materials and complete learning tasks provided in class. Students need to possess skills to identify credible sources for the materials and critically analyse the arguments in the resources (Rahayu & Sapriati, 2018). In turn, the use of online lectures and tutorials strengthens students' critical thinking, oral expression and builds positive attitude for learning in ICT environment (Mtebe & Raisamo, 2014).

Students were required to reflect on their learning experiences and frequency at which they used Open Online lectures and tutorials (eg. from Youtube) to enrich class learning activities and materials. The data based on FGDs confirm students' use of open lectures and tutorials to enrich classroom learning. Majority of students are aware and make attempts to access the opportunities associated with open online digital resources. They however encounter challenges with the choice of credible and context-relevant materials and difficulties to analyse contents. Common concerns across programmes and years of study include failure to focus on the contents (due to speed of the media); irrelevancy of many media and language difficulties. Such experiences are likely to compromise students' ability to conceive the value of such resources (Rahayu & Sapriati, 2018).
A relatively common view with first year students highlights familiarity with the technology and access to online lectures and tutorials, especially from YouTube, and that they opt for such materials when their classroom instructors have not been understandable. They use such resources to enrich classroom lecture material and for answering assignments:

> "*There are plenty good lectures on line for engineering subjects, especially from India, Japan and America; they are good to build on what our teachers teach us"* (Female student, BSc. Civ. Eng-UDSM. March, 2021).

However, a majority of them encounter difficulties to searching and selecting the most appropriate media.

> *"If you subscribe to YouTube, a lot of media pop-up, and sometimes you find it difficult to pick one because you are not sure if that is the relevant one* (Female 1st Year student- BRD-SUA. February, 2021).

Further qualitative data identify high cost internet as an inhibitor of regular use of digital resources and therefore mastery of effective use of the resources:

> *Yes there is wireless internet at the university; but this is seriously not reliable. You cannot depend on this internet source. The alternative internet source is based on mobile devices; although this is relatively stable, purchasing a reliable weekly internet bundle requires one to have around 5USD; this is too expensive for most of us* (Male Student-BSc. ANREB-UDSM. March, 2021).

> *Sometimes you need a lot of time to get relevant lecture videos and you have a lot of work to do! In the end your internet bundle is exhausted and you cannot go on. So you rely on the classroom hand outs and notes* (Male 3rd Year-BSc. AnHP-SUA. February, 2021)

The descriptive findings based on students' questionnaire at SUA (Figure 1) show that, 55 (17%) respondents never use open online lectures and tutorials; 49 (15.3%) rarely did and 66 (21%) sometimes did. Further in the order, 90 (28%) and 66 (21%) often and always used the online lectures and tutorials respectively. At UDSM (Figure 2), 51 (15.7%), 55 (16.9%) and 69 (21.2%) never, rarely and sometimes use open online lectures and tutorials. Other 79 (24.3%) and 71 (21.8%) respondents often and always use the resources besides instructors lecture and tutorial

materials. The data for UDSM, just like SUA suggest that, students are adopting the use resources offered by ICTs. However, despite the diversity of open e-resources some students have not taken it as an opportunity to enrich their learning process. Institutional strategies may be needed to fasten the pace of how students embrace the resources.

The general impression about students' use of Open online lectures and tutorials is that, students in universities still struggle to search, manage and integrate information to the learning tasks in place. The difficulties seem to be associated with limited support especially in a course of using the resources and instructors' limited pressure to nurture the culture to critically select and contextualize the e-resources. Students going through this experience are likely to lose interest on such resources for learning (Mayer, 2014). Therefore, universities need to design mentorship practices to support students' authentic use of the online lectures and tutorials (Rahayu & Sapriati, 2018).

The use of e-text materials for learning

Electronic text resources may be comparable to learning materials provided by classroom instructors and other prominent scholars and specialists or experts (Saeed, Ahmed & Ward, 2017). However, students need to possess skills to search and evaluate the quality of such resources. Students must be able to determine if a resource is reliable and valid enough for the given work and context. In many cases, the frequency of access and use of this form of resources/materials are important to determine their authentic use (Nalaila, Wawire & Gathara, 2022). The descriptive data for SUA in Figure 1 show that, a cumulative majority (72.4%) of students constitutes relatively regular users and the minority (27.6%) of students constitutes irregular users of the e- text resources, indicating a growing use of e-resources among students. At UDSM, (Figure 2), a cumulative majority (69.2%) of students at UDSM are relatively regular users. The minority (27.6%) of students indicates irregular users of the e-text resources. Such students mainly depend on shared or readily print reading materials such as handouts and text books.

Instructors' frequency to provide sequenced learning tasks which force students to use of e-resources is a determinant of students' pattern of using the materials. About 72.6% of instructors at SUA regularly engaged their students in activities which required them to search and use e-text materials and 27.4% engaged students irregularly in the said activities. At UDSM, 60.4% of instructors at UDSM regularly engaged students to search and utilize e-text materials along the learning processes. The response pattern shows that, instructors' tendency to engage students to use e-materials has corresponding effects on how students use the materials.

The findings based on FGDs show that, students who use this form of resources irregularly are mainly constrained by lack of access to computer (or similar devices) to download the materials; financial difficulties to afford the devices and confidence to use the accessible university computers:

> *"I don't have a computer; even a smartphone to download the materials; and I can't rely on other peoples' computers"* (1st Female student-PESS- UDSM: March, 2021).
> *Yes I did a subject on Basic Computer applications, with some aspects like computer hardware and software, search engines for websites and the use of word processing and spreadsheet software: I should say, I have never had enough time to practice the use of computer* (Male 2nd year

student BA. LIS-UDSM: March, 2021).

The findings based on FGDs across programmes and years of study provide an impression that, students are demotivated by large amounts of inaccurate, incomplete, and sometimes distorted information from their searches. For example, one student posited that:

> *"Sometimes you spend the whole day and download very many materials such as books, papers and some blog discussions, but later on you realize they do not answer the given question because they all have irrelevant information!" (Female 3rd Year-BSc. Forestry-SUA. February, 2021)*

The findings in this paper show that, despite the high frequency and a growing use of electronic text materials for majority of students, the selected universities have roles to help students to understand the basics for searching for specific information with minimum interference from distracting data.

Discussion via University LMS versus Social Networks

Students were required to reflect on their frequency of using University LMS and a WhatsApp mobile platform. Based on Figure 1 (for SUA), 10.9% of students never used the WhatsApp, 11.5% used it rarely and 26.5% used it sometimes. Furthermore, 31.8% and 19.3% used the platforms often and always. At UDSM (Figure 2), 23(7.1%) students never used the WhatsApp; 51(15.7%) used it rarely and 79 (24.3%) used it sometimes. Furthermore, 85 (26.2%) and 87 (26.8%) used the platforms often and always. The paper finds a growing use of social media particularly WhatsApp in academic related discussions. This makes it critical for instruction planners in universities to devise strategies to mainstream its use for learning. On the other hand, 36.7% and 39.9% of students at SUA never and rarely use LMS platform for discussion. Other 19.3% and 4% of students sometimes and often participated in the discussion via LMS platform. At UDSM, 127 (20.6%), 114 (18.5%) and 84 (24.9%) students never, rarely and sometimes participated in the discussion via LMS platform. This indicates that, the Moodle LMS at UDSM is not regularly used for academic related discussions.
The paper shows that, instructors' responses reflect a relatively similar pattern of students' use, whereas at SUA, 20(32.3%) and 23(37.1%) instructor respondents never and rarely engaged students to use LMS for discussions; 34(54.9%) instructors never engaged students in discussions via WhatsApp platform, while 16 (25.8%) rarely and 12 (19%) sometimes do. At UDSM, 26 (49.1%) and 14 (26.4%) instructor respondents never and rarely engaged students to use LMS for discussions. Otherwise, 23(43.4%) instructors never engage students in discussions via WhatsApp platform, while 9(17%) rarely and 15(28.3%) only sometimes do.

Despite the growing popularity of WhatsApp platform in the context of universities, its academic use among students involves sharing of announcements, reading materials, tests and examination results. These functions present challenge on the role of LMS in place because it is also entails similar functions among others. Just like SUA, the paper finds a slight mismatch of WhatsApp social network use between students and instructors at UDSM, with negative conceptions among instructors. Some evidence suggest that, the platform is mainly used for the interest of students and it has a limited academic focus because of the social nature of its functions. The perspective draws from students' FGDs:

> "*WhatsApp platforms are social in nature, such that academic discussions do not last longer because there are a lot of social issues of interest to many students"* (Male 3rd year BSc. Forestry-SUA. February, 2021).
> "*There is nothing seriously academic that students can discuss in their WhatsApp groups unless there are controls"* (Male instructor, School of Law-UDSM: March, 2021).

The findings further show that, the pattern of discussion via Moodle and WhatsApp platforms indicate that, while the irregular usage of Moodle among students is a replica of instructors' pattern, WhatsApp growing use results from the flexibility and social nature of the platform. Students enjoy the use of social networks (WhatsApp in this case) because they can share issues beyond academic topics.

> *Of course WhatsApp is a popular social network among students; students can buy smartphone purposely to subscribe to WhatsApp and to connect and share with other people news, announcements and other social information!* (2nd Year female BSc. Civ. Eng-UDSM: March, 2021).

The findings confirm the underutilization of Moodle LMS at SUA because it is a recent deployment and that not much has been done to raise awareness for its use. Students' perspective for the low utilisation of LMS is that, instructors have not designed any comprehensive tasks to oblige students' discussion via the LMS. One student reiterated that:

> *Moodle use is uncommon; we visit Moodle in order to see if our lecturers have uploaded some reading materials or any information. In case of some information there, one downloads and easily shares with folks in our WhatsApp groups, such that not everyone has to go there*! (Female 3rd year BIRM-SUA: February, 2021).

The paper finds that, students make a limited use of the available interactive platforms (namely, Moodle LMS and Social Networks) for collaborative and interactive learning. Based on the views by Rahayu and Sapriati (2018), universities and instructors in particular have a task to help students to define the requirements and benefits of such resources.

Design and use of PowerPoint presentations

PowerPoint presentation (PPT) is a common technology for guiding classroom instructor-students' teaching and learning related interaction. PPT presentations comprise of a number of individual pages or slides. The PPT slides are dynamic and can include text, graphics, sound and other objects which can be arranged by the presenter. Ways in which students design and use of PPT presentations determine their skills to create and edit digital content in different formats and express themselves through digital means (UNESCO, 2018). Based on Figure 1, majority (60%) of student respondents at SUA used PPT presentation regularly. With regards to Figure 2, up to 53.5% of student respondents at UDSM use PPT presentation irregularly unlike SUA, which suggests a relatively low usage of the technology.

The instructor side responses are in tandem with students' responses as 50% of instructor

respondents at SUA engaged their students to design and use PPT regularly compared to 37.8% of instructors at UDSM. The pattern here shows a difference on instructors' pattern to engage students' between the universities, such that, more instructors at SUA engage students to use PPT over those at UDSM. Further evidences show that, instructors in the selected universities use PPT presentations inconsistently. Instructors in some schools/colleges still make lecture presentations by reading from paper handouts. In turn, students rely on the same lecturer's handout/printouts. In either circumstance, students became unhappy when instructors do not provide access to the handouts because they trust such materials are content rich:

> *In our class, many teachers don't use PowerPoint presentation: They read before us and we take notes. If it pleases a teacher, he/she leaves a lecture handout for us to duplicate and share the print-outs; you can pass exams by just by going through the lecturers handouts* (Male 1st year student, BSc. Ed-UDSM. March, 2021).

Students' experience for designing PPT indicate that, they feel it is time consuming because one has to search and organize information from the web or read from text books, integrate the information in line with a question in place and then customize the material into the PPT. As such, ones' focus may turn to making a PPT appealing which may consequently compromise the quality of contents or the vice versa:

> "*The attempts to make the question materials suit the PPT format sometimes end up making us present something different!"* (Female 2ndYear student-BSc. HN-SUA. February, 2021).

The review of different PowerPoint presentations designed by students noted that, despite some good qualities in terms of color, slide design and transition, the PPT pages/slides for many students had overcrowded words, inconsistent font theme and size and lacked citations. This shows that, students are still struggling to use PPT technology and some of the challenges relate to management of information, editing, formatting, integration and sharing information.

Use of email communication

The study sought to confirm the use of email, a popular technology for communication and resource sharing between instructors and among students. Based on questionnaire responses UDSM (Figure 2), 13(4%) student never use email means of communication; 42 (12.9%) and 87 (26.8%) rarely and sometimes do. Other 100 (30.8%) and 83(25.5%) often and always use emails respectively. At SUA Figure 1, 30 (9.3%) students never use emails; 31(9.7%) students rarely communicate via email; 67 (20.9%) sometimes do. Other 110 (34.3%) and 83(25.9%) students often and always communicate via email respectively. Although majority of students often and always use emails, the evidence that some students do not use emails all suggest a divide in terms of technology use and pattern of skills development.

On the other hand, majority (49.1%) of instructors at UDSM often use emails to communicate with students. This is followed by 22.6% and 21% of instructors who sometimes and always do and 2% and 6% of respondents who never and rarely do. The responses show that, majorities of both students and instructors at UDSM use email communication regularly. At SUA, about 1(1.6%)

instructor never engages students in email communication; 1(1.6%) rarely do and 7(11.3%) sometimes do. Up to 27 (43.5%) and 26 (41.9%) instructors often and always engage students on email communication. However, students and instructors' interview responses indicate some issues with the emails students write:

> *There is time during the pandemic when students were required to send some results evidence by email. Instructors' feedback indicated some complaints that the emails by students had serious issues. For example, many students sent different emails for every attachment; email content (text) was written under subject part and many other students used accounts for some other people* (Male 3rd Year student-LLB-UDSM, March, 2021).

The findings based on both universities show that, instructors are unhappy with the types of emails students write. The following quotes justify the weakness of emails students in the study universities write:

> *Pertinent issues with emails majority of my students display include failure to write subject; the whole email body placed as a subject; Lack of continuity, as every reply email is written as a new thread; majority of students, many times don't write salutation* (Male Instructor, School of Law-UDSM. March, 2021)

> *Our students can't write good emails: A student can resend the same email, over and over again! Many of them write incomplete email, and many times do not respond on time* (Female Instructor, Veterinary Medicine-SUA. February, 2021)

> *Students can't structure good emails and most of them don't have a tendency to read emails regularly. Many others easily forget their email account details. So you can send information via email but you don't receive feedback because this is not something they are punctual with; they prefer and are good with WhatsApp communication* (Female Instructor, College of Agricultural Sciences & Fisheries Technology (COAF)-UDSM. March, 2021).

Apparently, the use of emails among students has recently grown, partly because of the COVID-19 pandemic which exerted instructors' pressure to emphasize on the use of emails as an alternative to face to face and print submissions. The rush for technology supported forms of interactions suggests that, universities are not proactive and that students in particular are challenged to make the authentic use of the technology (Mtebe, Fulgence and Gallagher, 2021).

Instructors' view on students' participation in ICT mediated learning tasks

Instructors' were asked to rate the participation of students on ICT mediated learning tasks by using a 4-points likert scale item with options between Very poor and Good, as indicated in Table 3.

Table 3: Instructors' perception of students' participation in ICT mediated tasks

	SUA (N=61)		UDSM (N=53)	
Perceived Participation Levels	*Frequency*	*%*	*Frequency*	*%*
Very poor	4	7%	3	6%
Poor	13	21%	11	21%
Average	30	49%	17	32%
Good	14	23%	22	41%
Total	**61**	**100%**	**53**	**100%**

Source: Field data (2021)

Instructors' responses in Table 3 show that, at SUA, 4(6.6%) and 13(21%) instructors conceive students' participation as very poor and poor respectively. A total of 30 (49.2%) and 14 (23%) perceive the quality of students' participation as average and good respectively. Otherwise at UDSM, 3(5.7%) perceive it very poor; 11(20.8%) see it poor and; 17 (32.1%) respondents conceive students' participation as average. A total of 22 (41.5%) instructors feel students' participation in ICT supported learning tasks as good. The instructors' perspective offers an impression that, students' participation in ICT supported learning is below the desired expectation of instructors. Instructors were further asked to establish the consistent learning attributes which define students' level of digital literacy skills for learning. Some attributes that stand out prominently are mainly weaknesses in such aspects like searching, evaluating, integrating and presenting information. The following quotes represent instructors' reflection of ICT use practices for 1st, 2nd and 3rd Year students respectively:

> *"Weaknesses in the use of services like track change, spelling check, anti-plagiarism software etc. Majority do not abide by power point presentation good practices; some take too long to check mails-they do well with WhatsApp; when writing assignments/proposals/research results, they face difficulties with layout, numbering, creation of reference list and table of contents"* (Female Instructor's reflection of weakness among 3rd Year students: Bachelor of Commerce-UDSM).
>
> *"Students do not observe ethics in writing and they do not know how ICT is used for learning at the university. ICT use in learning is NOT valued rather they use ICT as a way of socializing with friends [sic]" (*Male Instructor's reflection of weakness among 2nd Year students-Rural Development-SUA)
>
> *"Most students do not know how to type, format assignments; cannot use presentation technologies, mostly copy and paste internet materials in the assignment: Sokoine University of Agriculture has just developed ICT policies on the use of ICT for teaching e-learning [sic]. We hope these issues will be taken care-of"* (Male instructor's reflection of weakness among Year 1 students: BSc. AnHP-SUA).

The quotes above highlight some persistent weaknesses with outputs of students' ICT-supported learning task. The findings indicate that, instructors have serious reservations about students' actual use of ICTs and quality of learning outputs based on technology use, perhaps a reliable indicator of a state of students' digital literacy skills. This perspective aligns the findings by Nalaila, Wawire

and Gathara (2022) in which students perceived their digital literacy skills inadequate to support efficient ICT use for learning. Although instructors have a picture of how students should actually use the technology, it does not come out clearly whether instructors take trouble to mentor the appropriate ICT use (McKnight et al., 2016). University instructors are therefore challenged help students to re-define the desired digital literacy skills and technology use to improve learning outcomes (Wiegel, 2020).

Conclusions and Recommendations

Students' use of ICTs for learning in universities has permeated the daily learning routines and there seems a limited chance for the digitally illiterate students to learn comfortably. The paper confirmed students' uses of computers for typing assignments, designing and making PPT presentations; use e-mails, Learning Management Systems and Social Networks for resource sharing and discussions. Students also explore different forms of e-resources such as videos, books, journal articles the universities subscribed to as a supplement resources for classroom instructions. The students' actual use of the technologies in place however seems unguided, inconsistent and uncoordinated. For instance, there is a mismatch the frequency instructors and students use LMS and social networks as platforms of learning. The assignments and PPT majority of students write have some flaws which suggest that although students have access to different forms of electronic resources, they still struggle to make the desirable technology use for learning. Their academic outputs show some deficiencies on how students identify information needs, use up-to-date search strategies for the digital materials and tailor them rightly to learning tasks at hand. The common issues with their learning tasks include poor formatting, copy-paste of information, inappropriate referencing and citations and typographical mistakes which are likely to cause misinformation and unauthentic learning. This paper recommends for substantial efforts to make students aware and knowledgeable of the opportunities offered by the available ICTs. Students' digital literacy skills should be part and parcel of what transpire in class. Further, Universities are called to ensure focus on investment of digital literacy skills on both instructors and students in line with UNESCO's recommendations under Sustainable Development Goal 4.

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