Unlocking the Potential of ICT for Transformative Learning among Youth: A Path to 21st Century Competencies

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Article Info	Abstract
  Research Article	This paper reports the potentials of ICT in enhancing the acquisition of the 21st Century skills among youth in Higher Learning Institutions (HLIs). Within this broad aim, the paper highlights the possibilities of engaging youth in transformative learning tasks through technology as a necessary pedagogical tool for improving digital competence. The study employed quantitative and qualitative strategies in which both an online survey questionnaire and Focus Group Discussion were used for data collection. The link to the online questionnaire was distributed through Edmodo Learning Management System (LMS). A total of 133 respondents were purposively sampled. The SPSS version 21 was used to run the mean score and present findings in a tabular form. The qualitative data from the FGD were subjected to framework analysis. The findings included the prevalence of youth with moderate technological competence at the mean score of 2.83 while some lacked exposure to market-driven programmes and industrial attachment. Instructors integrate ICT in their teaching though they use very minimal tasks to promote youth entrepreneurship skills. Again, there are several stumbling blocks to the 21st Century skills acquisition. These include low accessibility of online resources, learning management systems, and unreliable internet. The paper concludes that deliberate efforts are required for critical investment in ICT at all levels of education. It recommends a collaborative approach among stakeholders in HLIs towards the acquisition of 21st Century skills among youth. **Key Words:** Youth, Digital Literacy, Digital Competence, Transformative Learning, 21st Century skills

1. INTRODUCTION

Besides being central for a country's socio-economic development, digital transformation is a bedrock of the international agendas and the goals of the Sustainable Development Goals (SGDs). The 2030 agenda, especially on education, recognizes the importance of technology for the achievement of the SDGs. Most of the goals that SDGs seeks to address are connected to digital transformation. For example, there is a high need to integrate technology in key issues to foster income growth, employment, and industrialization among member states (United

Nations, 2018). In light of the above, it has been strongly stressed with concern that Information Communication Technology (ICT) must be harnessed to strengthen education systems, knowledge dissemination, information access, quality and effective learning, and more effective service provision (Tang, 2015). The agenda also acknowledges that technology and innovation are key tools for moving the world onto a sustainable path. Underlying this is the slogan "no one will be left behind" in the sense that there is a need for holistic understanding towards socio-economic development (Jones *et al.*, 2017).

Again, by 2030, the agenda stresses the need to substantially increase the number of youth and adults with relevant skills, including technical and vocational skills, for employment, decent jobs, and entrepreneurship (Tang, 2015). The current emphasis around the world is the need to harness ICT for changes in economies and societies. Countries in the world expect youths to have technological competencies required for social-economic development. Yet, youth in developing countries are less likely to have access to technologies. In the United Republic of Tanzania, for example, just 30 percent of those in the 18–35 age group use the internet and/or own a smartphone against 100 percent in several advanced economies (International Labour Organisation, 2020). This difference leads to an assertion that youths in developing countries lack sufficient technological skills, although there have been global and national initiatives for technological innovations.

In the Africa Agenda 2063, several aspirations are stated but the upfront requirement is to include Transformed, Inclusive, and Sustainable Economies. It is stressed that technological transfer will hub the regional industrialization to the global value chains and commodity exchanges by 2023 (African Union Commission, 2015). This will help in several ways but mostly to end poverty, inequalities of income and opportunity, and address youth unemployment. It will also develop Africa's human and social capital through an education and skills revolution that embraces science and technology. Although the agenda aspires to create well-educated citizens and skills revolution underpinned by Science, Technology, and Innovation, the overall performance on this goal was only 24%. The continent registered good performance in basic education, with enrolment rates increasing from 76.8% in 2013 to 80.8% in 2019, although falling below the 2019 target of 90.7% (African Union, 2020). It remains unclear whether low technological innovation is due to weak individual country policies or other obstacles, such as corruption in delivering public services and lack of accountability among leaders. While this is hardly conclusive, the situation suggests a discrepancy between

the African Agenda 2063 and what is needed in the 21st Century visions many African countries aspire to achieve.

It is worth reflecting on the Tanzania Vision 2025, which stresses the need to embrace a strong and competitive economy through a diversified and semi-industrialized economy with a substantial industrial sector comparable to typical middle-income countries (United Republic of Tanzania Planning Commission, 1999). It also envisioned that Tanzania would brace itself to attain creativity, innovativeness, and a high level of quality education in order to respond to development challenges and the 21st Century skills. It remains an open question whether this has been achieved or not. Reflecting on the research findings by (Mtebe & Raphael, 2017) who identify the gaps such as unclear policies, resistance to change among instructors, limited electricity, inadequate funds, insufficient bandwidth and insufficient strategies on adoption on new technologies that can facilitate learning in the 21st Century. The implication is that the gaps put educators into paradox as the challenges appear to lead into unpromising directions towards the 21st Century skills.

Another government effort could be reflected in the Five-Year Development Plan of 2016/2017 to 2020/2021. In one of the strategies of human development, it is clearly stated that there is a need to expand the use of ICT in teaching and learning at all levels. This is emphasized to be a means for economic transformation (United Republic of Tanzania, 2016). The strategy perhaps should lead to the new educational innovations reflecting the needs of the 21st Century but there is still a shortage of evidence on what has been in place so far. This paper, therefore, undertakes an exploration of youth technological competencies towards enhancement of 21st Century skills.

The Integration of ICT for Transformative Learning among Youth

Today we are witnessing a radical transformation in the use of technology to enhance teaching and learning in most Sub-Saharan countries of which learners, including youth who have unlimited interactivity with 21st Century skills for learning. Reflecting on the International Society for Technology in Education Standards (ISTEE), learners must be prepared to thrive in a constantly evolving technological landscape that has a transformative power to enable them to cope with changes that occur in the society. Educational Institutions, such as universities should develop policies and practices which comply with the technological requirements of the 21st Century skills considering that learners have diverse learning profiles as they are already integrated with technology in most of the things they experience (Saykili, 2019). Based on the

report by UNESCO (2017) it has been emphasized that skills for the 21st century, digital literacy, and capacity building for sustainable development and world citizenship are lessons that all children, young people, and adults must develop for education to make a decided contribution to achieving Agenda 2030 together. To develop a better understanding of the needs of the 21st Century, one needs to know what to learn and how to learn. In the 21st Century learning can be viewed as an overarching vision of education that many educators now advocate for a collective response to the challenges in which learning takes various models for collaborative learning (Chai & Kong, 2017).

Other researchers have confirmed that the education systems must be outfitted with a prerequisite of ICT resources both hardware and software, and the curricula must integrate a collaborative learner-centered environment to which students will relate and respond as one of the 21st Century skills (Boholano, 2017). However, the need is to produce good quality learning through ICT in the 21st Century. Both instructors and learners must be aware that ICT tools are for knowledge construction, critical and creative thinking, and authentic problem solving, and application of knowledge to their previous academic experiences (Chai & Kong, 2017). As well, Pineida (2011) proposes changes in the education system to ensure that students develop technological and learning competencies, and teachers develop teaching, learning, professional, and technological competencies to achieve the learning outcomes.

The research on the 21st Century education preferences shows that students are highly interested and engaged when ICT is integrated into teaching and learning albeit with some selections. Dube (2017) found that students prefer emerging technologies, such as Google classroom instead of the LMS, YouTube video supported lectures, and any other electronic content compatible and accessible from their ubiquitous mobile devices. Their preference is on the digital platforms that enable content access independent of space and time and without heavy dependence on the internet. On this basis, educators ought to ensure they align what is taught with learners' including the youth's aspirations and needs. However, some key questions remain unanswered about developing nations but only two suffice here. Do educators use the appropriate learning ICT based pedagogical approaches for honing the 21st Century skills? Do learners have sufficient exposure to the technological skills that foster the development of 21st Century skills? In fact, the research indicates that there has been low integration of ICT in teaching in HLIs in Tanzania of which there is a likelihood of low enhancement of 21st Century skills among youth (Mtebe & Raphael, 2017; Mungwabi, 2019).

Studies by Kisanga and Ireson (2015), Mtebe and Raphael (2017), and Ndibalema (2019) observed a high resistance by instructors in HLIs to integrate ICT in teaching because they lack pedagogical skills to integrate it. Researching on the integration of ICT in HLIs, Mbalamula (2016) found that a majority of lecturers at the University of Dodoma (59.8%) use ICTs to provide assignments whose completion required the use of the internet and providing of classroom activities to students. The observation marked by these researchers is an illustration that the integration of ICT in teaching and learning in Tanzania is at the basic level. One would wonder how lectures explore various software and systems that learners of the 21st Century needs to be exposed to. Technological applications that allow creativity, innovation, collaboration, critical thinking, and reflection must be harnessed and exposed to students. A critical note by Mtebe and Raphael (2017) is some lecturers at universities in Tanzania never used technologies in their own studies, thus they have no previous knowledge of integrating the technologies. However, this may not be the only reason why ICT is not integrated into university teaching and learning. The literature indicates several constraints to an effective integration of ICT in higher learning institutions. Becuwe *et al.* (2017) identify and categorizes the reasons in first to third order categories. The first-order constraints consist of inadequate access, time, training, and institutional support to the integration of ICT. The second-order constraints focus on teacher educators' personal traits, such as low pedagogical beliefs, technological beliefs, and willingness to change while the third-order constraints are a lack of design thinking skills in which technology is not considered as a state of art in solving the existing problems (Becuwe *et al.*, 2017). These constraints justify an affirmation that the mentioned constraints in most developing countries are multifaceted.

Writing on technology integration in HLIs, Byungura (2019), in developing countries, including Rwanda, technology has failed to add the intended value to university services, despite huge associated investments. There has been a poor delivery of services due to insufficient integration of technology. Reflecting the on various research findings in Tanzania, it is clearly stated that universities face several challenges, including inefficient local area network, aging ICT facilities, inadequate computer laboratories, financial constraints, and low usage of electronic information resources by stakeholders, just to mention a few (Mtebe & Raphael, 2017; Ndibalema, 2019). These challenges appear to reflect on what is happening in most sub-Saharan universities. For instance, a study in Rwanda by Mukama (2009) revealed that individual challenges mainly include late exposure to IT tools and the internet within the

complex university learning environment, which makes students, who are the novice technology users, passive and reluctant to use technology for learning purposes. On this basis, the situation raises several concerns about whether the 21st Century skills can be achieved by youth in HLIs under these circumstances. Technology is identified as a vehicle towards the acquisition of the 21st Century skills among youth. However, several obstacles limit their achievement.

The 2030 SDGs targets on education stipulate a need for a good proportion of youth and adults with information and communications technology (ICT) skills and a minimum level of proficiency in digital literacy skills (Tang, 2015). Tanzania being a member of the United Nations has translated the SDGs goals into feasible plans and strategies. For instance, the FYDP II of 2016 stipulates some interventional strategies, which include promoting employable skills, particularly for youth, women, and people living with disabilities (United Republic of Tanzania, 2016). On this, the emphasis is on extending ICT applications at all levels of skills training and learning. Like many Sub-Saharan Countries, Tanzania is witnessing a big skill gap among youths. The 2014 Integrated Labour Force Survey for Tanzania revealed that out of the economically active youth population, 11.0 million (88.3 percent) persons are employed and 1.5 million (11.7 percent) are unemployed (National Bureau of Statistics, 2015). Another glaring gap of skills is on the expectations of graduates that 79 percent of graduates aspire for wage employment upon completion of their basic training and only 17 percent consider self-employment. These aspirations by graduates jeopardize the goal of promoting self-employment, despite the fact that only 44 percent of graduates get employed in a year (National Bureau of Statistics, 2015). Similarly, Kakengi, (2019) reports that graduates in Tanzania stayed unemployed after graduation, a significant majority (41%) experienced unemployment for a period of less than a year, 29% less than a month, and 19% for a period of between one and two years while only 11% said it took them more than two years to find a job.

The situation raises a number of questions about education in higher learning institutions' ability to produce graduates who can compete in the job market. Several studies (Ndyali, 2016; Stima & Kuppusamy, 2018) restate the problem of unemployment in Tanzania as youth keep on searching for jobs unsuccessfully. An important question that comes from this struggle is why would these youth seek to be employed rather than being employment creators. Three subsequent questions follow this main question: are there key strategies to empower youth to become innovators after their graduation? Is the potential provided by technology been

harnessed to empower youth to live and work in the 21st Century? Are there important ICT-based delivery systems for learning among youth? Have Universities scaled up the existing ICT infrastructure and incubation solutions to enable youth to cope with the digital environment after their graduations for creating solutions? Perhaps, ICT policies have been in place and many universities struggle to ensure improvements in the standards of ICT facilities for youth to become knowledge creators. The Tanzania Commission for Universities (TCU) standards guideline of 2019 requires all HLIs to establish sufficient ICT facilities, including computers and access to the internet for students and the staff (Tanzania Commission for Universities, 2019). This extends the need to explore various ICT-based initiatives in place for enhancing youth development that can boost the industrial economy.

The research in HLIs clearly indicates that there have been some challenges in ICT integration in enhancing learning among youth. Mahenge and Sanga (2016) report that many HLIs have not yet embraced ICT infrastructure available to complement technology-enhanced learning due to inadequate adoption of changing technologies. Other reported challenges include intermittent electricity, insufficient internet bandwidth, inadequate funds, and ICT policies that do not favour critical integration (Ndibalema, 2019). In another study by Mungwabi (2019) lack of skills was mentioned by 50% of the respondents, low bandwidth was mentioned by 48% of the respondents, power cuts were mentioned by 40%, and lack of some programs and facilities by 35%. Despite the increased challenges on the integration of ICT in HLIs, there is an indication of the digital divide which might lead to deprived accessibility of information necessary for the 21st Century generation.

Reflecting on the preceding challenges, it makes sense to raise a number of concerns with regard to the integration of technology for learning among youth in responding to the skills needed in the 21st Century. The first concern is on the extent to which undergraduate youth are exposed to the world of work through technological-based solutions exposure. The second concern is on the extent to which technology is harnessed to enhance transformative learning among youth. The third concern is how technology is used to link undergraduate youth and the industry relevant to their career. Based on the reviewed studies, it is possible to conclude that youth lacks appropriate ICT knowledge of the 21st Century, of which by implication leads to the digital divide. On this basis, this study aimed at investigating youth experience at the University of Dodoma on the technological environment for bridging the existing digital divide with the aim to be productive in their future career after their graduation. In more important ways, the

study sought to inform educators on the future ICT consideration to boost the acquisition of the 21st Century skills among youth. The study was guided by three research questions as outlined next:

i.   What are the youth competencies in the use of ICT for the acquisition of necessary skills for the 21st Century?
ii. What are the perceived ICT based learning practices for enhancing 21st Century skills among youths?
iii. What are the perceived stumbling blocks towards ICT integration in the acquisition of 21st Century skills?

2. METHODOLOGY

The study employed simple descriptive statistics backed up with quotations from the focus group discussion which involved class representatives with the aim to describe and analyze the phenomenon regarding youth ICT competencies for 21st Century skills. The quantitative approach involved data collection through online survey questionnaire while the qualitative approach involved the Focus Group Discussion.

Study Group

The study involved 133 undergraduate first year students (Youth) from one University in Tanzania who specialized in multimedia technology degree programme. Purposive sampling technique was employed to determine a sample in which the researcher believed that undergraduate students' opinion and perception are more representative to describe youths' ICT competencies for the 21st Century. All participants were registered in digital media psychology and learned in blended mode in which Edmodo Learning Management System was used as an online platform. The composure of participants is summarized by gender in figure 1 next.
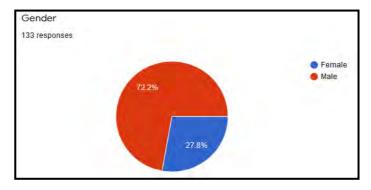

Figure 1. Respondents by Gender

Data in figure indicate that female participants were only 27.8% while Male participants were 72.8 %.

The Online Survey Questionnaire

This study employed an online survey questionnaire was used to collect data about youth perceptions and skills about ICT integration for the acquisition of 21st Century skills. According to Kumar and Naik (2016) online survey questionnaire has a list of questions prepared electronically and sent to various informants by e-mail or other online platforms.   The questionnaire contains questions and provides space for answers to which the request is made to the informants through a cover letter to fill up the questionnaire and send it back within a specified time (Kumar & Naik, 2016). On this basis, thirty items were formulated on Four Likert scale points which were used to assess youth's perceptions towards the integration of ICT for 21st Century skills. The questionnaire was administered by uploading the google form link to all students who specialized in the multimedia technology degree programme through Edmodo LMS at one university in Tanzania. The questionnaire was closed-ended with a four-point Likert scale of Strongly Agree to Strongly disagree. Four to one scoring values were apportioned to their responses respectively. The decission rule was determined at different levels as suggested by Pimentel (2019) that the perception level is considered as "Not Much" if the mean scores of the test are between 1.00-1.75 and "A Lot" if the score is between 3.28-4.0 as summarised in the following table.

Table 1.

The Scale Description

Likert Scale	Interval	Difference	Description
1	1.00-1.75	0.75	Not much
2	1.76-2.51	0.75	A little
3	2.52-3.27	0.75	Some
4	3.28-4.00	0.72	A lot

Source: (Pimentel, 2019)

In the context of this study, the descriptions by Pimentel (2019) were contextualised by the researcher to make more sense as follows: The descriptions "Not much and A little" were assigned another meaning as "Low" while, "Some" was assigned "Moderate" and "A lot" was

assigned "High" perception. On this basis, the level of perception was considered as " Low" if, between 1.00 and 2.51, the level is considered "moderate"; if between 2.52 and 3.27, if between 3.28 and 4.00 is considered as "high". The consideration of online survey questionnaire was considered to appropriate and useful in terms of preparation, data collection takes short time, storing of data is easy, visualization of data at any time is possible and the data are directly entered into a database where they are immediately available for analysis (Nayak & Narayan, 2019). In the same way, Rice *et al.* (2017) stress that the online survey questionnaire allows the researcher to obtain large volumes of survey data quickly and cheaply compared to more traditional survey methods. Although the method appears to have many benefits, there are some challenges, such as sampling, response rate, non-respondent characteristics, maintenance of confidentiality, and limited access to sharing portals (Nayak & Narayan, 2019; Rice *et al.*, 2017). Being aware of these challenges, the researcher managed to share a link to a specific group registered in Edmodo LMS although some participants could not respond having been invited and reminded to respond to the questionnaire. The online questionnaire was sent to 184 participants but only 133 responded.

The Focus Group Discussion

The Focus Group Discussion (FGD) is normally referred as to a group interview seeking to understand how certain people with common characteristics feel about a certain topic (De Vos, Delport, Fouché, & Strydom, 2005). Only four FGDs were carried out in this study. These comprised of six participants as recommended by Creswell (2012), De Vos, Delport, Fouché, and Strydom (2005) that a considerable size may range from four to six. It is one of the methods that allow the researcher to carryout the discussion with the target participants in a more relaxed environment where there is a series of questions on a particular topic (Ary, Jacobs, Sorensen, & Razavieh, 2010). The FGD was thought to be appropriate among class the representatives as there was a need to seek complementary data regarding youth's perceptions towards their ICT competencies for the 21st Century. According to Morgan (1997), there are three basic uses of FGDs:

- They are used as a *self-contained* method in studies in which they serve as the principal source of data.
- They are used as a *supplementary* source of data in studies that rely on some other primary method, such as a survey.

- They are used in *multi-method* studies that combine two or more means of gathering data in which no one primary method determines the use of the others.

In the context of the present study, the main consideration was on the second usefulness as the tool was used to provide supplementary qualitative data to the descriptive data obtained from the online survey questionnaire.

Data Analysis

The participants' responses were analyzed descriptively with Statistical Package for Social Sciences (SPSS), version 21 to obtain the mean score and standard deviation. Following this, the necessary tables were formed. The responses from FGD were subjected to framework analysis. The framework analysis is described by Ritchie and Spencer (1994) as an analytical process that involves several distinct though highly interconnected stages. The five key stages outlined are familiarization, identifying a thematic framework, indexing, charting, mapping, and interpretation. Following these steps, it was easy to draw and compare discussions of similar themes and examining how they relate and vary between individuals in the group. Several sub-themes which comply with the data gathered from the online survey questionnaire were generated for complementation.

Validity and Reliability

In maintaining the validity of the questionnaire, several strategies were employed. It is important to note that validity refers to the extent to which the instrument measures the concept in question, and that the concept is measured accurately (De Vos, Delport, Fouché & Strydom, 2005). In maintaining the content validity, the judgment criterion was considered to be appropriate. According to Rubin and Babbie (2001), content validity is established based on judgements; that is, researchers or other experts judge about whether the measure covers the universe of facets that make up the concept. On this basis, the online survey questionnaire was created and shared with the other two experts for scrutinization of the content before it was administered to the participants. Experts were able to provide their opinions regarding the statements which had similarities. Thus, six items were discriminated. In maintaining the reliability of the questionnaire, Cronbach's Alpha was run to test the internal consistency. In this case, the Cronbach's Alpha (α) was 0.76 which indicates that the questionnaire was reliable.

The Credibility of the FGD

In maintaining the credibility of the FGD guide, two strategies were employed. The first strategy was the engagement of three experts from one University in the appraisal of the FGD who provided their opinion for improvement. Expert opinion helped the researcher to restructure and reduce the number of questions. According to De Vos, Delport, Fouché and Strydom (2005), the FGD guide is suggested to have fewer than ten questions. On this basis, after a thorough scrutinization, the researcher maintained only five questions in which they were enriched by follow-up questions during the sessions. The second strategy included respecting the diversity of individual members in the group, encouraged participation, and probed participants without biasing their responses.

3. FINDINGS AND DISCUSSIONS

The findings are presented hereunder as per research questions using mean score and complemented with the narrative quotes;

Youth Competence in Using Technology in their Learning

The descriptive statistics indicate that overall students' competence in using technology for 21st Century skills were found to be moderate (M=2.83) as most of the statements felt under the moderate category as presented in table 1 next.

Table 1

Perceived Youth Competence in using Technology (N=133)

Item	Mean	Decision
I can access ICT resources at the college which help me to have sufficient technical skills to run different programmes	3.24	High
I know different software and hardware I can use to prepare my learning resources and produce digital content	3.08	Moderate
I have sufficient technological skills for networking with different firms appropriate to my career	1.95	Low
I know different programmes I can use to share learning resources to the colleagues	3.07	Moderate
I can access Massive Open Online Courses (MOOCS) for enriching my learning	3.03	Moderate
I can create my electronic library for the accessibility of learning resources at any time	2.69	Moderate
I can troubleshoot internet problems and collaborate with my colleagues through the internet platforms	2.91	Moderate
I can access various gadgets at the college that transform my creative potentials	2.90	Moderate

I can create interactive animations, electronic games and simulations, learning systems as part of my career	2.19	Low
I can to use different the Learning Management Systems such as Edmodo to collaborate with instructors and colleagues	3.27	Moderate
Overall Mean: 2.83		

Table 1 shows various perceived technological competencies that are necessary to meet the 21st Century skills. Out of ten items, only two items felt under "Low" category of which respondents were of the view that they had no sufficient skills for networking with firms related to their career at the mean score of 1.9. Some lacked skills for creating interactive digital content at the mean score of 2.1. Although students' technological competencies appear to be "moderate" and "high" in most of the responded aspects, the findings from FGD confirm that some needed exposure to interventions that improve their technological skills. Consider the responses from the FGD with some first-years students' representatives generated the following quote:

> Most of us are from poor families and schools that when you talk about computers some people will be wondering. Some of us are not competent as we have started being exposed to the technological gadget at the college. Exposure to technology must start early even in primary school (Class Rep 4, 2019)

Intepretation of the quote above leads to a conclusion that ICT investment should be made at all levels of education. The meaning that arises from these findings is that ICT integration in lower levels of education is in the infancy stage. This problem is intensified by the obsolete ICT infrastructure deployed in teaching and the learning environment, limited ICT competency among teachers and tutors as well as a lack of comprehensive ICT training that focuses on the effective integration of ICT in teaching and learning (United Republic of Tanzania, 2015). Personal experience from teaching at university shows that a large majority of students join a university with a deficiency in ICT skills, which could because ICT is not integrated into teaching and learning at the lower levels of education. This, therefore, calls for deliberate intervention starting from the lower levels of education.

As evidence that a deficiency in ICT skills is a national problem, a study that was carried at the University of Dar es Salaam by Mungwabi (2019) revealed that students had a low level of search skills as a major challenge in using ICTs effectively. Mugwambi added that this deficiency was due to poor connectivity and unreliable power in the environment when the students resided. Thus, the university becomes a central place where a large majority of students get exposed to some ICT issues. This calls for a strengthened integrated ICT use in universities

to enable these students to develop and integrate ICT skills in their careers. Also, the study by Alemu (2017) in Ethiopia revealed that universities fail to provide appropriate ICT-training courses for instructors to develop their technical ICT skills. This prevented the instructors and students from using ICT in teaching and learning. Again, the study outlines the institutional factors, such as lack of proper access to ICT resources, overcrowded-classrooms, lack of technical and pedagogical support which are more influential on the integration process. Some of the findings of the current study also agree with the findings by Lukwale (2016) who found that students at Ardhi University in Tanzania (90.7%) are capable of using ICT facilities while 90% of the students agreed that the ICT facilities in the university need to be updated to suffice the demand posed by large classes as well as catch up with the increasing pace of ICT. Yet, the authors do not provide a logical framework on how ICT literacy among youth could be well linked with the acquisition of the 21st Century skills that are necessary for creating technological products. One would expect a clear mention of how exactly technology is integrated into boosting learners' in using and understanding to create new ways of thinking to find solutions to new problems and to create new products as well as services.

In the digital age, the university students are expected to develop the capacity to identify and use technology efficiently, effectively, and ethically to access, organize, evaluate, and share information. This is important for them to develop skills for becoming self-directed, independent learners and workers who can adapt to change, manage projects, take responsibility for their work, lead others and produce results (Beers, 2011). It is worth mentioning the issue of transforming learning as one of the important aspects in enhancing the 21st Century skills which appear to be somehow ignored in HLIs of which most teaching is focused on grades rather than what youth can do.

Mezrow (2000) insists that participatory pedagogies must be the heart of teaching and learning in which learners must be involved in critical self-reflection to develop transformed habits of the mind. Several questions follow this important remark by Mezrow: does this happen in the classroom in HLIs in Tanzania? Has technology been harnessed to support self-reflections? Are the technological platforms feasible to support the same? The evidence available shows that most HLIs in Sub-Saharan Africa have minimal integration of technology to foster participatory pedagogies. Owusu-Agyeman and Larbi-Siaw, (2018), for instance, argue that the needs of adult learners in three universities in Ghana are not being met, partly because of inappropriate

pedagogical approaches. On this basis, learning platforms must be strengthened to support the acquisition of the 21st Century skills that are potential in stimulating the industrial economy.

As a plan for transformation to industrial economy, Tanzania has introduced the five-year development plan which addresses the integration of technology for equipping youth appropriate skills to work and compete in the world market (United Republic of Tanzania, 2016). Although the plan is clear, one has to work hard to extract how can we extend the potential of ICTs more widely in HLIs to bridge the gap of employability among youth after their graduation. From the focus group with students representatives, one respondent was quoted saying:

> Today, several graduates stay jobless, yet entrepreneurship, value, and soft skills are not emphasized in most of our programmes. How would we become entrepreneurs with the limited training we receive? (Class Rep B, 2019).

 On the same, another respondent said:

> There has been insufficient exposure to the industrial attachment during the practical training due to the short time and others are posted in places where you cannot practice what you are taught (Class Rep A, 2019).

The two quotes from students' representatives capitalize the need to emphasize entrepreneurial and soft skills which are key drivers towards achieving the 21st Century skills. One would say that some reforms in some programmes must be made to incorporate the mentioned values. Joynes, Rossignoli and Amonoo-Kuofi (2019) report that there is a need for new forms of learning to tackle global challenges although there is no a unique approach to the definition of the 21st Century skills. It is on this basis, this paper recommends the need to harness technology to foster entrepreneurial and soft skills among youth in HLIs. Inspirational programmes regarding the industrial attachment must be in place to enable youth to get sufficient exposure to the skills relevant to the labour market. A clear partnership between universities and companies let say responsible for software and digital content production must be created to enhance the exposure of prospective graduates to the labour market. Apart from the common practical training, orientation programmes towards the potential of technology in enhancing employability skills among prospective graduates must be part of the curriculum and mission of HLIs.

ICT based Learning Practices for 21st Century Skills among Youth

The second research question sought to get the youth' perceptions about the contribution of ICT based learning to the acquisition of the 21st Century skills. The results are summarized in Table 2.

Table 2

ICT based Learning practices that enhance 21st Century skills (N=133)

Item	Mean	Decision
Tutors create online conversations help us to collaborate	3.35	High
Tutors monitor and respond to messages and projects submitted through the learning platforms	3.40	High
Group Projects we are assigned expose us to the real world of work	3.30	High
We are assigned tasks that enable us to become better future entrepreneurs	2.38	Low
Instructors assign me tasks that improve my identity	3.40	High
Tasks we are exposed to technological, practical that improve our creative potentials	3.42	High
Instructors expose to us to tasks that ensure and predict my future employability	2.33	Low
The content we are learning connects us with our lives and the world	3.40	High
The content we are learning extends our understanding through collaboration with others	3.38	High
We are exposed to tasks that help us to think beyond the four walls of the classroom	2.41	Low
Overall Mean: 3.07		

Table 2 shows various perceived ICT based learning practices that are employed in teaching to enhance necessary the 21st Century skills. Out of ten items, only three items were found to be Low. This implies that instructors integrate ICT in teaching and learning. Although the descriptive data seem to favor instructors in integrating technological aspects of teaching, some respondents presented different opinions during FGDs. It was noted with concern that there are inconsistencies among instructors in integrating ICT in teaching and learning. The following is a quote from one of the FGDs:

> Some instructors expose to us the learning platforms that are useful for our career growth as we can access and share e-resources while others never mention even the use of learning management systems (Class Rep D, 2019).

As one reflects on the existing disparity, certain two notions appear. First, there no clear strategies guiding instructors towards the emphasis of blended and e-learning in HLIs. Second, there is no dedicated university wide LMS that can be used to enhance e-learning. However, the instructors limited integration of ICT in teaching and learning could have been influenced by the lack of awareness on possible LMSs that can facilitate the acquisition of the 21st Century

skills. Thus, an intervention should start with raising the awareness among the instructors for them to be able to guide students to acquire them. Figure 2 presents an analysis of students' responses on whether they use technology to develop products at university.
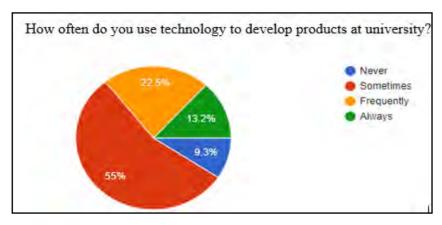

Figure 2. Responses to the Use of Technology among Youth

Source: Field Data, 2019

It was found that 9.3% of 133 respondents never developed any technological product. The situation raises a concern on whether instructors have clear plans to expose these students to the tasks that enable them to be productive or not. Although most universities in developing countries are investing in technological facilities to support teaching and learning, proper utilization for developing the 21st Century skills among students has not been fully realized. Writing on ICT integration for competitive universities, Sarvi and Pillay (2015) consider three broad areas that require attention: the infrastructure, the application software, and e-resource, and staff development. Often, enthusiasm is depleted after the infrastructure investments are completed. In some organizations, technologies may be applied in the procurement of application software but staff development is mostly neglected. The findings of the current study are somehow contrary to the study findings by (Makewa, Kuboja, Yango, and Ngussa (2014) who established that instructors of the University of Arusha, Tanzania were competent in basic use of ICT such as the use of PowerPoint, Excel, Microsoft Word, online search procedures and internet programme. On the other hand, instructors lacked advanced skills, such as online marking and data management procedures which appeared to limit proper ICT integration. Equally important, in the study by Mahenge and Sanga (2016) on ICT for e-learning in HLIs concluded that the rate of adoption of mobile learning in HEIs of Tanzania is very low because a majority of HEIs in Tanzania do not utilize fully the opportunity brought by ICT for e-learning due to resource and network bandwidth constrained environments. The findings raise

several concerns on how instructors in HLIs enhance the acquisition of 21st Century skills among youth. The experience indicates that some instructors in HLIs employ lecture method which appear to be less interactive due to low integration of technology in teaching (Mbalamula, 2017; Mbalamula, 2016). By becoming more aware of the potential provided by ICT, instructors may capitalize on critical strategies that promote the acquisition of the 21st Century skills.

Despite the improved learning environment in HLIs, many lecturers are not fully integrating technologies to accommodate different learning needs among the youth they teach. Reflecting on the findings by Mahenge and Sanga (2016), one would conclude that most lecturers in HLIs in Tanzania never used technologies in their studies, and hence lack technical skills on integration. Should this be the teaching culture if we are to transform the young generation? Is there any room for change? Should lecturers keep on maintaining the status quo? Should things be done in the same ways years and years? It is the author's view that the purpose of teaching in the digital age is to guide students towards discovery and innovations. This is possible if instructors enforce the problem based learning reinforced by technology. (Mannathoko and Mamvuto (2018) write that learner-centred pedagogies in sub-Saharan African contexts is challenged by large class sizes, cultural values and beliefs, limited teacher knowledge and skills, and a lack of appropriate instructional materials. Although these challenges prevail in most HLIs in sub-Saharan Africa, it is possible with technology to teach large classes as if they are small. Instructors in HLIs must develop digital competence as part of the 21st century skills so that students can model from them. In the context of the present study, digital competence is taken to mean technological technical skills possessed by both instructors and students for enhancing teaching and learning. On the same, (Linares and Romero (2016) view digital competence as an essential skill for today's instructors, since they have to manage several aspects from the subject being taught to pedagogical tools.

Stumbling Blocks for ICT Integration in HLIs

The findings revealed that several stumbling blocks limit youth from developing digital competencies, which are one of the 21st Century skills. Table 3 summarises the responses followed by narrative findings from the FGD with class representatives.

Table 3

Stumbling Blocks for Integration of ICT

Item	Mean	Decision
Despite the availability of ICT infrastructure at our college, instructors have not deployed fully the learning platforms in teaching	2.64	Moderate
As students, we use ICTs to learn but we are not exposed fully to new systems and online assessment strategies	2.58	Moderate
Accessibility of online resources prepared by tutors is still relatively rare and the access is limited	2.74	Moderate
Emphasis on blended learning (face-to-face and online learning) at our college is still at the infancy stage	2.74	Moderate
There is minimal use of e-resources as supplementary tools to a face-to-face method in our courses	2.63	Moderate
Instructors are sometimes not exposing fully to the appropriate technologies needed for my career growth	2.48	Low
There is little evidence that supports the view that the integration of ICT in learning predict my future career and employability	2.44	Low
The absence of appropriate information on technology integration initiatives at the college limits the integration	3.18	Moderate
Lack of awareness of different programs regarding appropriate technology for my career growth	2.96	Moderate
Lack of sufficient practical sessions with technological devices limit the acquisition of appropriate skills	2.85	Moderate
Overall Mean: 2.72		

Table 3 shows various perceived stumbling blocks that limit the acquisition of the 21st Century skills among youths through technology. Out of ten items, only two were considered to be "Low". The two don't appear as stumbling blocks while other items were rated under "moderate" category. It was also noted that most students lack an awareness of appropriate technology necessary for enhancing the 21st Century skills. Consider the descriptive information in the Figure 3.
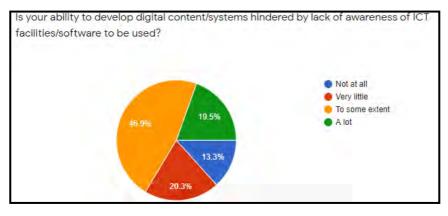

Figure 3. Youths Ability to Develop Digital Content/systems

Source: Field Data

It was founs that 19.5% of the students responded that their ability to develop systems and digital products is hindered by a lack of awareness of proper technology to be used. During the FGD, it was noted that students' expectations of employability are very low. One respondent was quoted saying:

> We use our extra time to learn so many programmes beyond the classroom to ensure that we become competent. After graduation, nobody is assured of a job but, with technology, we can create our own products and create self-employment opportunities (Class Rep E, 2019).

The quote above creates an understanding that some students know that technological skills would be a panacea to the growing unemployment status but the practices at universities become a stumbling block towards technological development in universities. Despite the increased access to technological systems and devices as drivers towards the 21st Century, graduates cannot create jobs of which is an indication that something is not right. In this digital age, students expect to go through different ICT based strategies, such as electronic learning, blended learning, and mobile learning as well as cloud learning paradigms but this has not been the case in most HLIs in developing countries. Researching on the integration of ICT in HLIs, Mahenge and Sanga (2016) revealed that a majority of the challenges are caused by high dependency on the internet connection, increased number of users that lead to decreased system performance for automated/semi-automated learning systems, resources and network bandwidth constrained environment and high cost due heavily dependent on the Internet. On this ground, how do you expect the graduates to develop relevant skills if technologies are not fully utilized for enhancing teaching and learning. Dube (2017) concludes that the general observation in the learning institutions particularly in the least developed countries demonstrates that these ICTs are underutilized in teaching and learning. Also, Ahmad (2013) claimed that educational institutions have not been assisting graduates towards their involvement in entrepreneurship, rather than work for other people, or organisations. It is clear that the society in 21st Century requires educational systems that endow young people with new skills. The skills have to be aligned both to the new forms of socialization and to the new knowledge-based economy (Ananiadou & Claro, 2009). It is on this basis, that HLIs must ensure that they help youth to learn to apply the knowledge they have learnt reflecting real life

experiences. It is expected that youth are exposed to several 21st century skills which include soft skills and technological skills.

4. CONCLUSION AND SUGGESTIONS

While the current study involved a small sample which might be difficult to generalize the findings it provides a broad picture to understand the practices in the broad context. The study has brought, on board, the necessary experiences from youth (students) regarding the consideration of technology to promote 21st Century skills. Educational stakeholders in HLIs would need to pay attention to some critical issues being raised in this paper. The key findings include the prevalence of youth with moderate technological competence while they lack exposure to market-driven programmes and industrial attachment, instructors are integrating ICT in their teaching while tasks for promoting youth skills as future entrepreneurs are minimal. Again, there were several stumbling blocks to the 21st Century skills acquisition, such as low accessibility of online resources, learning management systems and unreliable internet.

In the light of the findings of this study, it is safe to conclude that the enhancement 21st Century skills among youths are a responsibility of HLIs in collaboration with other key stakeholders to create a future independent society. In achieving this, the study recommends the following:

First, technological literacy should be part of the education curriculum across different levels of education to ensure that every member of society become digitally competent. To achieve this, deliberate measures to invest in technological facilities is inevitable. On this, HLIs should serve as role models as the community expects greater expertise and innovations from them.

Second, the need to equip instructors with technological skills for improving students' learning practices for 21st Century skills is inevitable. If the right and appropriate technologies are developed among instructors, learners will have an opportunity to engage in technology-based learning which leads to the development of their skills and knowledge for the 21st century. On this basis, emphases must be on equipping instructors with capacities to promote emerging 21st Century skills among youths.

Third, industrial attachment in the period of study among students is recommended as the best strategy to expose youth to the world of work and productivity. Workshops and seminars would be carried out at the college whenever possible to create awareness on the latest technological innovations and products as an inspiration strategy for future productivity.

Finally, ICT-based professional development strategies must be regularly planned so as to enable instructors update their skills and dynamics of the labour market. This may enable a

strong exploration of different strategies on how youths can cope with the 21st Century skills and unemployability challenges.

5. LIMITATIONS AND FUTURE RESEARCH

The study was conducted with only undergraduate first-year students as the researcher was unable to assign randomly the research tools to other students specializing in other fields and postgraduate students. In this case, it sounds logical not to generalize the findings; instead, it would be useful to replicate this study in other HLIs with a similar context. This might involve a larger sample and other students in different specializations as well as instructors for complimentary purposes.

This study was carried out in one semester focusing on a specific group registered in digital media psychology. Future longitudinal research could be carried out to examine the integration of ICT in learning in promoting 21st Century skills regardless of their specialization. Longitudinal research may provide more valuable results on the use of ICT in promoting 21st century skills among youth.

Gençler Arasında Dönüşümsel Öğrenme için Bilgi ve İletişim Teknolojinin Potansiyelini Tespit Etmek: 21. Yüzyıl Yeterliliklerine Giden Bir Yol

Özet

Bu çalışmanın amacı, yükseköğretim kurumlarında gençler arasında 21. yüzyıl becerilerinin kazanılmasını sağlamada bilgi ve iletişim teknolojilerinin potansiyellerini araştırmaktadır. Bu geniş amaç çerçevesinde çalışma, dijital yeterliliği geliştirmek için gerekli bir pedagojik araç olan teknolojinin gençleri dönüşümsel öğrenme görevlerine dahil etme olanaklarına vurgu yapmaktadır. Veri toplama sürecinde hem çevrimiçi anket hem de odak grup görüşmelerinin kullanıldığı nicel ve nitel yöntemler kullanılmıştır. Çevrimiçi anketin bağlantısı Edmodo öğrenim yönetim sistemi aracılığıyla katılımcılara iletilmiştir. Çalışmaya gönüllü olarak 133 kişi katılmıştır. Bulgular, ortalama 2.83 puanda orta düzeyde teknolojik yeterliliğe sahip gençlerin yaygınlığını ortaya koymaktadır. Bulgular, öğretmenlerin gençlerin girişimcilik becerilerini geliştirmek için asgari görevler kullansalar da bilgi ve iletişim teknolojilerini öğretim süreçlerine entegre ettiklerini göstermektedir. Bunun yanı sıra, 21. yüzyıl becerilerinin kazanılmasında bazı engeller bulunmaktadır. Bu engeller arasında çevrimiçi kaynakların düşük erişilebilirliği, öğrenme yönetim sistemleri ve internet konusundaki erişim ve güvenlik gibi faktörler bulunmaktadır. Çalışma, tüm eğitim düzeylerinde bilgi ve iletişim teknolojilerine yönelik yatırımın gerekli olduğunu göstermiştir. Son olarak, gençler arasında 21. yüzyıl becerilerinin kazanılmasına yönelik yükseköğretim kurumlarında paydaşlar arasında işbirliğine dayalı bir yaklaşım önermektedir.

Anahtar kelimeler: Gençlik, dijital okuryazarlık, dijital yeterlilik, dönüşümsel öğrenme, 21. yüzyıl becerileri

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