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# Online Assessment in the Era of Digital Natives in Higher Education Institutions

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## Abstract

This study explored students' opinion towards the opportunities and inhibitive factors for online formative assessment. A Google form survey questionnaire was administered to 124 students to generate the information regarding the opportunities of online assessment. Purposive sampling technique was employed on the basis that participants were students registered through Edmodo LMS studying multimedia courses. A system walk-through strategy was used to collect qualitative data from Edmodo platform. A descriptive analysis on the data generated from a survey monkey questionnaire was employed while content analysis was carried out for qualitative data. The findings are presented based on the research questions as follows: First, it was revealed that there were several opportunities from online assessment which included divergent thinking, self-reflection and immediate feedback among students. However, the study revealed several inhibitive factors towards online assessment such as unreliable internet accessibility, lack of technological devices and negative attitudes among students. The study established that in order to have effective online formative assessment, the capacity building to both instructors and students is inevitable. Furthermore, the study calls for the need to harmonize the curriculum by capitalizing on the integration of online formative assessment to support blended learning among digital native students at all levels of education.

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## Introduction

In recent decades, adoption of online assessment has become a fundamental aspect in improving the quality of learning in Higher Learning Institutions (HLIs) in many countries so as to meet the learning requirements of digital natives. Mayhew (2018) outlines that there has been a significant move towards institutional online assessment in many countries geared to meet the learning needs of digital natives although it is still a complex and challenging practice. Yet, many educators in HLIs are faced with the challenge of devising and implementing effective pedagogical practices that truly advance digital natives learning (Bahati, 2019). Online assessment does not only require technological competence, but a thoughtful pedagogical shift from paper-based assessment to individualized facilitation to meet the learning demands of digital natives in the 21<sup>st</sup> century. The term „digital natives“ in this paper is considered to mean a group of students who grew up in the era of digital

age that have a close contact with computers, mobile phones and the internet.

In order to meet the 21<sup>st</sup> century learning needs of digital natives, many countries including Tanzania have been struggling to invest a lot of technological resources to improve the quality of teaching. According to Boitshwarelo et al., (2017) assessment in HLIs in the 21<sup>st</sup> century must focus on evaluating competencies and capabilities of the learner so as to enable graduates become competitive in the global economy. In this case, facilitators have an important role to fully utilize technology in supporting the transformative learning approaches in which assessment is for learning. This may require both instructors and learners to have sufficient technological competencies. The practical point is that, facilitators must explore technological environment to equip themselves with new pedagogical skills that suit the 21<sup>st</sup> century learning needs of digital natives. It is envisioned that instructors who think beyond four walls of the classroom, must have ability to carry out assessment which engages a learner in holistic approaches and inquiry-based learning. Yet, there have been some concerns regarding the use of online assessment tools to support students' learning in HLIs. Khan and Khan (2019) explored the perspectives of university students on online assessments and found technological incompetence with students and instructors. The trends in ICT adoption for assessment in HLIs in most countries, triggers some serious questions that need to be asked. Does the assessment through technology align with the 21<sup>st</sup> century learning needs? Is the assessment being conducted for learning? Do HLIs have sufficient capacity to engage learners in online assessment? Perhaps, these questions form the basis of critical reflection and review on the existing digital divide in HLIs in most developing countries.

In Tanzania for example, there are the ICT Competency Standards for teachers which guide instructors to integrate ICT into curriculum and assessment but they appear to be limited to the use of presentation packages (United Republic of Tanzania, 2015). Although the ICT framework for teachers is in place, the evidence indicates that very few private HEIs have adopted e-learning compared to public HEIs. This is due to limited initial investment, lack of expertise, lack of guaranteed electrical power, poor strategic change management plans, and lack of innovative ideas (Mwamahusi & Tossy, 2017). The research by Mtebe and Raphael (2017) demonstrate inhibiting factors for ICT integration in HLIs in Tanzania which include lack of internet connectivity, lack of support, lack of awareness, negative attitude towards ICT, lack of policies, lack of facilities just to mention a few. Given these conditions, one would find it difficult to realize the potential of technology in enhancing assessment for learning. Moreover, the education training policy in Tanzania supports the integration of ICT in teaching and learning in order to meet the national development needs which are consistent with the 21<sup>st</sup> century skills (United Republic of Tanzania, 2014). Nevertheless, one could see an interesting paradox where the policy emphasizes the integration of technology in teaching, yet, assessment for learning through technology (online assessment) is given little emphasis.

The integration of ICT in teaching in HLIs specifically the online assessment is unclear. The available ICT integration framework for teachers rarely mentions specific strategies for online assessment in HLIs. In the study by Nangawe (2015) it was revealed that the use of ICT tools in HLIs in Tanzania largely depends on the attitudes of academic and non-academic staff as it was revealed that there was a moderate use of web-based assessment for supporting students' learning. Elsewhere, it has been noted with concern that although online

assessment has many advantages, it is rarely used in HLIs due to several challenges which include security issues, lack of institutional e-assessment policies, lack of preparation and experience among instructors to control the e-assessment systems to meet the learning needs for all (Appiah & van Tonder, 2018). There is no doubt that the idea of integrating ICT in teaching in HLIs is good, but the initiatives to achieve the same remain slow. Despite its implication in promoting students' learning, the contribution of online assessment in HLIs in Tanzania is under-researched. Yet, even when instructors try to utilize the potential of online assessment, there are often obstacles that hinder the implementation. Thus, this paper highlights descriptive and interpretive information regarding the online assessment obstacles in HLIs.

## **Self-Directed Learning in the Digital Age**

Self-directed learning (SDL) is considered as a psychological process of learners that purposively direct themselves to gain knowledge and understand how to solve problems (Long, 1994). The origin of self-directed learning lies somewhere in the distant past when a human being experienced a sense of self-awareness or self-consciousness in the process of trying to master a particular chunk of knowledge or a necessary skill and then systematically began steering or managing the learning process (Van der Walt, 2016). Linking the idea with online assessment in the digital age, it has been noted by Geng et al., (2019) that self-directed learners tend to search the online learning platform for resources. It is on this basis that the model is considered appropriate with the view that participants in this study were engaged in online assessment through Edmodo learning management system. The platform activities considered the individual learner's interest, experience and willingness to engage in learning. The consideration of this theory allowed learners to learn from the online assessment as a strategy that aimed to help them think beyond the four walls of the classroom. The emphasis of SDL in the context of online assessment aligns with the view on the need to promote learner centred approaches as the means to achieve the 21<sup>st</sup> century skills for digital natives. On this regard, Jacobs & Toh-heng (2013) stress that in learner-centred learning classrooms, students actively participate in the peer and self-assessment process, in conjunction with teacher assessment, for formative assessment. Moreover, (Durnali, 2020; Mahlaba, 2020; Torun, 2020) found that SDL is the strongest predictor of academic achievement and thus, e-learning practitioners should support students in establishing proper relationship between their own learning objectives and learning needs in e-learning. Although SDL appears to be beneficial and a major determinant for students' learning through technology, it has been challenged that sometimes students lack sufficient time and sustained motivation (García Botero et al., 2018). The critical lessons one may draw that when the instructor is designing the online assessment tasks for learners there must be some motivational strategies that make a learner active in the platform. Learners must be encouraged to analyze and explore their own learning needs through the opportunities provided by Learning Management Systems (LMS). Bradley (2020a, 2020b) makes it very clear that an LMS allows instructors to facilitate and model discussions, plan online activities, set learning expectations, provide learners with options, and assist in problem-solving with processes for decision making. Researching on factors influencing the acceptance of LMS, (Abdul Hamid et al., 2020) indicated that proper and well planned content delivery, comments and feedback that engage students in learning, would facilitate their beliefs and more satisfaction of learning through technology. Yet, technological integration to support SDL requires an engaging and collaborative virtual learning environment in which students should attain the

autonomy of participating. The designing of a technological learning environment requires hands-on experience in which both instructors and learners can realize the 21<sup>st</sup> century learning requirements (Burch & Mohammed, 2019). It makes sense to conclude that for effective SDL practices through LMS, instructors need to go the extra mile to consciously provide warmth and a sense of belonging to learners in the platform which can be achieved through providing clear instructions and feedback (Ananga, 2020).

### **Making Sense of Online Assessment in the 21<sup>st</sup> Century**

Most Higher education institutions in developing countries typically rely on traditional paper-based assessments, often developed by instructors on their own but with little or no input or training from knowledgeable peers, psychometricians, or others with specialized expertise, and without the support of advanced statistical analysis tools (US Department of Education, 2017). Tanzania is not an exception as there is a heavy dependence on the use of printed learning resources at all levels of education. Even the assessment is based on paper. There has been a growing interest to shift from paper to paperless assessment in this case online assessment as graduates need to perform duties and work in the digital era. The literature indicates that the ultimate goal of online assessment is to support learning that is transferable to changing environments that illustrate 21<sup>st</sup> century professional essentials (Baleni, 2015). According to Boitshwarelo et al. (2017) there are multiple and disparate interpretations on the kind of knowledge and skills needed to make one live and work in the twenty-first century, and hence, there is little clarity as to the forms of assessment that can be used most effectively to assess the knowledge and skills required for a digital age.

Geisinger (2016) outlines four types of 21<sup>st</sup> Century Skills: collaborative problem solving, complex problem solving, creativity and digital and information literacy which help to create students who can address real life challenges. In order to acquire these 21<sup>st</sup> century skills, instructors need to apply several learning styles which promote learner-centered learning. SDL has been one of the learning styles in which learners have an opportunity to explore self-management and control skills (Durnali, 2020). Engagement of students in SDL helps in transformation of assessment from memorization and reproduction of facts to active reflection on individual and peer assessment practices (Mahlaba, 2020). Researching on how SDL can be enhanced through online homework (Wiggins et al., 2021) conclude that online homework system gives the students the opportunity to make choices and realize learning than being driven by marks. It makes sense to acknowledge the role of online learning platforms which enable several attempts to a task after facing a certain failure which is one of the considerable values for SDL. Enforcing online assessment among digital natives through SDL could be the best learning strategy as it symbolizes life-long learning skills.

Although online assessment through SDL appears to be beneficial, more often instructors are likely to face resistance to online assessment if learners don't see the value associated with it. In the digital age, technological acceptance could be more useful to both instructors where everyone has the potential to reinforce the other. Researching on online assessment in HLIs, Khan and Khan (2019) conclude that in order to have online assessment acceptance, students need to be convinced of the usefulness of the transition to online assessment before they embrace it willingly and the interactivity with instructors should remain personalized, active and

meaningful. According to Gikandi et al., (2011) effective online formative assessment can foster a learner and assessment centered focus through formative feedback and enhanced learner engagement with valuable learning experiences. Learning among digital natives in the 21<sup>st</sup> century requires instructors who are ready to design the online formative assessment tasks that provoke learners' thoughts. According to James (2016) the online assessment is widely recognised in providing greater flexibility and instant feedback to learners. Many digital natives have better ICT skills of which if they are exposed to online assessment strategies, there is a very high chance for effective learning. A good example can be reflected in several studies carried out to assess the impact of online assessment during COVID-19 pandemic. In the study Elzainy et al., (2020), it was found that the engagement of students in online assessment brought about higher students achievements and promising staff perceptions with improved technological skills. Likewise, it has been reported that the transition to formative online assessment has facilitated students' learning, improved communication and prompt feedback (König et al., 2020; Snekalatha et al., 2021).

It is worth reflecting on the contributions of transition to online learning. Paudel (2021) found that online learning during COVID-19 pandemic promoted online research, connected practitioners with the global community and increased their skills for accessibility of online resources. Ismaili (2021) notes critical implications from the transition to online learning as increased positive attitudes and willingness of many students to engage in distance learning classes in the post-COVID19 pandemic as there is an immense potential future for e-learning platforms in higher education institutions. It remains to be seen that online learning leads to more flexible teaching and learning in which several learner-centered strategies can be realized. However, there were several challenges associated with online assessment as Korkmaz and Toraman (2020) outlined problems educators experienced during COVID-19 pandemic in Turkey such as inability to make a reliable assessment of learning and lack of knowledge about how to evaluate the learners' knowledge and skills, difficulty in providing feedback to students, difficulty in supporting learning according to the students' interests and abilities.

Moreover, Unger and Meiran, (2020) found that most students expressing anxiety toward online learning which appeared to be different from standard in-class learning. In some other studies, however, online assessment was challenged by personal factors such as academic dishonesty, lack of skills for online assessment, lack of reliable online assessment systems, lack of proper preparations and insufficient attention to formative online assessment (Daniels et al., 2021; Gamage et al., 2020; Guangul et al., 2020; Sharadgah & Sadi, 2020). These studies suggest the need to revise educational policies with emphasis on technological innovations and systems that may support online assessment. Likewise, ElSaheli-Elhage (2020) concludes that there is a need for states and educational institutions to create new emergency policies and plans to implement when natural disasters occur requiring immediate school closures with a focus on training teachers, introducing e-learning platforms and guidance of digital and non-digital learning options.

This study therefore provides insights on how online assessment enhances students' learning. Several studies have found that there has been some opportunities and several challenges towards online assessment as one of the key strategies for online learning in HLIs in most developing countries (Adarkwah, 2021; Mtebe & Raphael, 2018; Mwamahusi & Tossy, 2017). The current study therefore was carried out with the same purpose to

examine and explore opportunities and perceived factors facing online assessment in HLIs. Thus, this study determined inhibitive factors towards online assessment in the Tanzanian context which appears to be given little attention through research. The following were the specific research questions which guided the study and which were examined in details:

1. What are the perceived learning opportunities from online assessment among students?
2. What are the inhibiting factors for effective online assessment?

## Method

The study employed simple descriptive statistics backed up with quotations from the focus group discussion with the class representatives and system walk-through in Edmodo Learning Management System posts. All participants were engaged in a blended learning approach through Edmodo LMS where the platform was used for online assessment among students registered for a digital media psychology course for 16 weeks. During the process, students were engaged in online assessment activities using Edmodo LMS including online quizzes, discussions, assignments, and viewing course contents. The study involved 124 undergraduate first year students who were purposively sampled from one university. Participants were registered in a digital media psychology course which was taught in a blended mode. Figure 1 gives a summary of the respondents per gender.

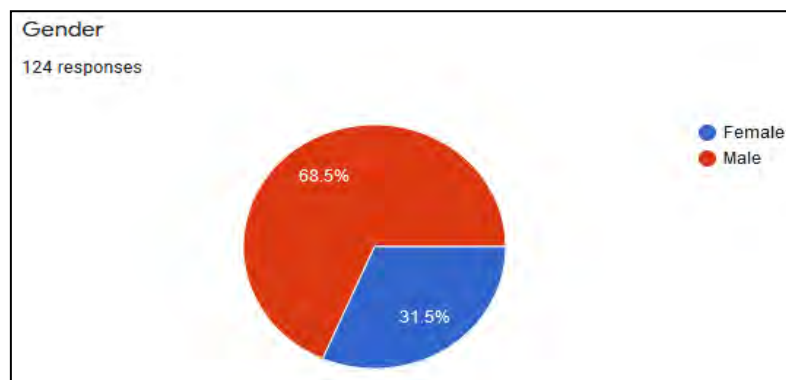


Figure 1. Respondents by Gender

The survey monkey questionnaire was administered through Edmodo LMS to students who were purposefully selected with the aim of getting a general overview of online assessment while the system walk-through was carried out in the Edmodo platform to analyze students' posts regarding online assessment for acquiring supplementary information. The respondents on the closed ended questionnaire indicated their response on a four-point Likert scale of Strongly agree to Strongly disagree with 4 to 1 scoring values which were apportioned to their responses respectively. According to Ary et al., (2012) likert scale assesses individual's perceptions and attitudes towards a given topic in this context, online assessment. The decision rule was determined at the mean score of 2.5 as suggested by Pimentel (2019). Thus, each item with the mean less than or above 2.50 was either rejected or accepted. The participants' responses were analyzed descriptively with SPSS data analysis software to obtain the mean score and standard deviation. Following this, the necessary tables were made.



The responses from Edmodo platform posts were subjected to content analysis. The responses collected from the platform posts were subjected to content analysis which included categorization and classification of major themes and subthemes. Several posts about opportunities and limitations of online assessment were read and examined carefully by breaking down the statements into *key words*, *statements*, *comparing* them and then *classifying* them to generate categories which reflected the research questions.

The trustworthiness of the posts from the platform was ensured following three main phases as suggested by Elo et al., (2014). The first phase includes preparation phase in which the researcher must ensure proper data collection procedures, sampling strategies and selection of the unit of analysis. The second phase includes organization in which categorization and abstraction is made, interpretation and representativeness is carried out. The third phase includes reporting results in which the researcher must present the results logically and report the analysis procedures. On this basis, the continuous self-reflection and criticism guided the whole process of content analysis to ensure accuracy of qualitative data presented in this paper.

### **Ethical Considerations**

The study design and procedures were reviewed and approved by the University ethical research committee and the researcher adhered to all necessary considerations to ensure informed consent and protect participants' confidentiality and privacy. According to De Vos, et al, (2005) the researcher has an obligation to ensure that respondents' rights to self-determination is not violated instead must be protected. Due to the critical need to maintain privacy, each participant was requested to create and use pseudo names to sign in the platform. Participants were not allowed to include their photo in their account profile. Again, the invitation to participate in the online Google form questionnaire described the purpose of the study and they were given the freedom to ask questions before the engagement in the Edmodo platform. The researcher did not have an access to the data in the platform until the submission was made by the participant.

### **Results and Discussion**

Based on the question regarding learning opportunities, results from the survey monkey questionnaire, most aspects were highly rated, obtaining the mean score above 2.5 placing 11 aspects being accepted while only 1 was rejected. Table 1 summarizes the results followed by results from the participants' postings in the LMS. Table 1 shows the various perceived online assessment learning opportunities by students during the course. A mean value of 2.5 was used as the test mean (cut off point). Any item with a mean of 2.5 and above was considered to be actually an opportunity for learning as perceived by majority of the students. On this basis, 11 out of 12 items listed in table 1 were perceived learning opportunities while the remaining 1 was considered as minor opportunity as perceived by the students. The rejected aspect "Online assessment is appropriate for learning for all students and those with disability" was found to be associated with other factors such as the nature of devices they had as were revealed during the online posts and discussion.



Table 1. Learning Opportunities from Online Assessment (N=124)

<b>Learning Opportunity</b>	<b>Mean</b>	<b>Std. Dev.</b>	<b>Decision</b>
Online assessment enhances my thinking beyond four walls of the classroom for learning	3.46	.74459	Accepted
Online assessment offers the possibility of self-checking on the current level of knowledge which motivates me for further work	3.27	.72263	Accepted
Immediate result obtained upon test completion is really motivating for further learning	3.20	.76229	Accepted
Online assessment offers the possibility of verifying errors and making corrections at any time for filling in my knowledge gaps	3.02	.69816	Accepted
A random, personal set of questions promotes divergent thinking	3.18	.76316	Accepted
Online assessment provides instructors with immediate feedback to improve my learning	3.29	.75966	Accepted
Online assessment provides an unbiased grading which improves my learning process	2.91	.87654	Accepted
Online assessment enhances self-learning and problem-solving skills	3.19	.74527	Accepted
Online assessment improves my technological technical skills	3.33	.74833	Accepted
Online assessment is appropriate for learning for all students and those with disability	1.99	.91648	Rejected
System feedback helps me to reflect on my merits in learning	3.14	.66590	Accepted
Online assessment increases my chance to acquire digital literacy skills	3.34	.74100	Accepted

### Findings from Qualitative System Walk-Through

The analysis from the system posts focused on identifying the learning opportunities from online assessment. The themes generated from the raw data are summarized in Table 2. The results from Table 1 and 2 indicate that online assessment provides more opportunities for students to improve their learning. Students' comments about the usefulness of online assessment demonstrate their acceptance of learning through technology. These results concur with the previous findings in the sense that online assessment is valued due to a number of features such as its potential for immediate feedback and unbiased grading (Alsadoon, 2017). In the same way, the study by Petrisor et al. (2016) revealed a high level of acceptance of online assessment tools due to their better suiting for knowledge assessment and objectivity. Consistent with the findings of the present study, Gikandi et al. (2011) found that effective online formative assessment can foster a learner and assessment centered focus through formative feedback and enhanced learner engagement with valuable learning experiences. The study informs the need for transformation in pedagogical strategies in terms of shifting an assessment culture in a way that supports diverse learning needs. A critical perspective among educators in the 21<sup>st</sup> century teaching could be how to harmonize the learning tasks to suit the diverse needs of the learners. Given this context, assessment in the 21<sup>st</sup> century must pay attention to interlinked multiple skills needed by the learner.

Table 2. Generated Themes from Qualitative Analysis

S.No	Opportunity	Key Aspects	Representative Quote
1.	Motivating a learner	Timely feedback for learning	“...we are extrinsically motivated with the online assessment. It is really encouraging as you get feedback on time, which is different from the conventional assessment” (Student D, 2020)
2.	Strengthen collegiality	Improved online collaboration with instructors	“.....online assessment has been useful as it gives us the opportunity to interact with our instructor. When we are given the assignment, we have an ample time to digest it online and attempt it with appropriate resources shared in the platform” (Student F, 2020)
3.	Develops Digital Culture	Technology transforms students” digital norms	“..... the online assessment has helped us transform our mindset and develop digital culture. When we registered in the platform at the beginning, it was not easy to cope with the course requirement given that mot continuous assessment package is online. Slowly However, gradually, we had an obligation to comply. As I speak today, it is part of our daily norms and practices” (Student C, 2020)
4.	Technological confidence	Technology improves students” skills	“ ..... as you engage in online assessment, you improve your confidence in dealing with technical challenges. When you are responding to the online assignment, let us say online quiz, you are likely to explore quickly the solution and which gives you confidence that keeps you addressing technical challenges” (Student G, 2020)
5.	Transparency in information sharing	Improved transparency for learning	“.....the platform has been helpful in making me share the assignment information openly. When an instructor posts an assignment, students have the room to discuss it and request further clarification and sometimes relevant readings (Student A, 2020)

Possibly, well planned online formative assessment inspires and guide learners to envision in more reflective learning opportunities that shift their thinking and actions in a sustainable future productivity. Writing on the same, Baleni (2015) posits that online formative assessment can nurture a student and assessment centered focus through formative feedback and enrich student commitment with valued learning experiences. Although online

formative assessment appears to have significant benefits such as enriching students' commitment towards learning, still one can notice some gaps. The 21<sup>st</sup> century teaching requires instructors to transform their teaching into a more transformative approaches being supported by technology. Unfortunately, many educators in HLIs have not been effectively promoting online formative assessment as one of the most important aspects towards transformative pedagogy.

As it has been noted, assessment in most HLIs has continued to be on papers as opportunities supporting online formative assessment have not yet been fully explored (Guàrdia, Crisp & Alsina, 2017). What has really changed that triggers the need for online formative assessment? Perhaps, there are several factors on the matter which may include the following: First, increase of digital native students who have a culture of connectivity and online creating and sharing. In this digital age, most students are wired to the digital tools in their daily life which triggers the need to migrate to online formative assessment for learning. Second, there has been an increased use of various innovations for supporting learning. This is due to increased development of learning portals which address the diverse learning needs of the learners. Third, an increased community demand for graduates with technological skills. In fact, the knowledge community in Tanzania and elsewhere would need to see graduates from Universities having the required technological skills so as to be more productive in the community. HLIs that consider online or blended learning have no obligation to avoid online formative assessment, although there have been a number of cautions. For instance, Tanis (2020) insists that effective online teaching and learning requires a carefully designed classroom that promotes student engagement with faculty, peers and course content. This implies the ability of instructors to plan and organize proper online assessment activities for proper students' interactivity. The findings of the present study are reflected against the ideas by Mitra and Barua (2015) who found that online formative assessment with automated feedback improved the performance of the students with a better academic background in the summative assessment. This highlights the value of supporting instructors to use various learning portals that support online formative assessment as a tool for transformation towards the acquisition of 21<sup>st</sup> Century skills.

Reflecting on the current study, students also considered the formative online assessment as a tool to foster instant formative feedback from instructors and peers. This has also been highly reported by other researchers who found the similar findings (Hepplestone et al., 2011; Jonsson, 2012; Ogange et al., 2018). Formative online assessment plays tremendous roles in education and have a number of benefits over conventional paper-based assessment tools, including reliability of grading and efficiency in terms of time, effort and money spent on the exam process (Shraim, 2019). According to Bahati (2019) technology enhanced feedback helps learners consolidate their strengths and identify their weaknesses. Mitra and Barua (2015) write that paper-based formative assessment followed by face-to-face feedback in the class often makes the low-achiever feel bad. In fact, the feedback students receive through online formative assessment; helps them get additional information for learning. However, the way learners perceive feedback as constructive for learning; relates to the way it is provided and language used (Havnes et al., 2012).

Despite the learning opportunities from the feedback through online assessment, there are concerns that sometimes don't work if the students cannot make sense of them. Again, the feedback from online assessment

loses its meaning if it is not informative and timely and due to that some students may understand the feedback differently from the teacher or from peers (Grob et al., 2017; Spector et al., 2016). A growing number of literature supports the assumption that online formative assessment provides instant feedback and greater flexibility in terms of location and timing, improved interactivity enhances students' learning (James, 2016; Ogange et al., 2018). It makes sense to conclude that assessment in the 21<sup>st</sup> century depends on digital technologies due to the fact that digital native learners should benefit rather than depending on paper assessments only. It is on this basis that one may conclude that online formative assessment enables learners to take active and responsive role in their self-learning rather than depending on paper work assessment as it has been experienced in some of HLIs in developing countries.

### **Inhibiting Factors for Online Formative Assessment**

Categories of descriptions and thoughts about inhibiting factors for online formative assessment were generated from students' posts and online discussions. Table 3 indicates students' thoughts or views on the inhibiting factors for online formative assessment. The results in Table 3 indicate that there are multiple factors that contribute to poor transition from paper to online assessment which range from infrastructural to pedagogical limitations. The content analysis reflected in Table 3 presents individual factor on online assessment being attributed to students' beliefs on technology. Some respondents appeared to have negative attitude and fear about the transition to online assessment. The major claim brought forward from students on low acceptance of new technology was associated with culture. It was articulated with concern that they were not used to be exposed to technological systems since their lower grades of education and they came from different socio-cultural context. Similar findings are described in the study by Demosthenous et al., (2020) who found that students had low self-efficacy beliefs on online assignment as they feared about possible negative consequences concerning their marks due to other members' behavior and the lack of experiences. It is difficult for students who are not digital natives to accept new innovations easily. Reflecting on the Technological Acceptance Model developed by (Davis, 1986) the acceptance and behavioral intention to use technology is determined by the person's attitude toward using the technology and the perceived usefulness.

Researching on the matter on technological acceptance in Higher Education, Hamutoglu (2020) suggests that there is a need of mobilizing technology to suit the needs of learners who come from different cultures. It makes sense to note that although respondents come from different cultural context, their responses regarding their readiness towards online assessment is low. It is perhaps difficulty to expect students to accept new system for online assessment where their own competencies in integrating technology require significant improvement. Students who are technically skilled and have essential technological skills are considered to have high readiness in e-learning (Holsapple & Lee-Post, 2006). It becomes a complex task for instructors to transform students' readiness in a controversial learning environment. For instance, an alarming situation was noted during the outbreak of COVID-19 pandemic where most instructors and students were reluctant to migrate to online learning due to low technological readiness and background. In the study in Albania by Xhelili et al., (2021), it was found that students who were reluctant to learn online were not familiar with technology-based education and lacked background of internet usage.

Table 3. Inhibiting Factors for Online Assessment

Category	Sub-Theme	Representative Post
Infrastructural	Unreliable internet access	“Most of us who live off campus sometimes are faced with the challenge of internet access which makes it difficult for us to access the online assessment resources” ( <i>Student T, 2020</i> )
	Lack of enough specific technological innovation space	“There is no specific innovation space where we can meet to explore and test our ideas” ( <i>Student P, 2020</i> )
Moral	Academic Dishonest	“Through online assessment, let us say when you carry out the online test, there is a high chance of cheating” ( <i>Student Z, 2020</i> )
	Negative attitude	“Online assessment is sometimes stressful for instance when there is internet shut down while you are attempting the online quiz. This leads into less comfortable learning environment than the paper-based assessment” ( <i>Student L, 2020</i> )
Individual	Limited accessibility of personal devices	“Some of us don’t possess personal devices which would make us spend much time scrambling with the devices in the labs. Some questions need high typing speed but because we are not used to these technological gadgets, sometimes we don’t complete the assignment on time. The situation is even worse to students with disabilities as there are no specific assistive devices to help them cope with the online assessment” ( <i>Student H, 2020</i> )
	Limited exposure to technological innovations	“We are from families where we cannot access gadgets. Some of us lack exposure to necessary technological issues as we are not used to interacting with them” ( <i>Student J, 2020</i> )
	Low acceptance and readiness of new technology	“We are from different socio-cultural context and background. It is sometimes difficult for us to cope with new technology which has not been part of our culture since lower grades of our education” ( <i>Student I, 2020</i> )
		“Lack of interest in some questions and lack of bandwidth when you want to do some tasks are a problem” ( <i>Student M, 2020</i> )
Organizational support	Limited orientation on basic skills in e-learning	“We need a clear orientation on e-learning strategies at the college when we report for the first time” ( <i>Student R, 2020</i> )
	Lack of awareness of ICT policies	“We need to be exposed to all ICT institutional related policies which could guide us to be aware of e-learning practices” ( <i>Student X, 2020</i> )
Pedagogical	Lack of basic skills on online assessment	“We cannot do the online assessment properly for now as we have been used to paper work since we were in preschools. Sometimes we are not comfortable with the online assessment due to lack of experience about it” ( <i>Student F, 2020</i> )
	Few instructors integrate technology in their teaching	“Some instructors don’t expose us to online assessment while others do. This reduces our skills on transition to online assessment since only few courses are facilitated in a blended mode” ( <i>Student L, 2020</i> )

While online learning has generally taken place through recorded lectures and online platforms, some universities have postponed learning and teaching until further notice, due to the lack of information technology infrastructure for both students and teachers (De Giusti, 2020). The strong lesson one could draw from these findings is that there could be lack of digital culture, readiness and strategic digital solutions to most of the HLIs in the developing countries. This has been also revealed in the study by (Junus et al., 2021) who found unstable internet access and lack of self-management skills among lecturers to be the most factors inhibiting online assessment during COVID-19 pandemic.

The results of the analysis from several literatures regarding the migration to online remote learning during COVID-19 pandemic suggest that both the instructors' and students' digital readiness was minimal in most countries (Agormedah et al., 2020; Slimi, 2020; Sunarto, 2021). Therefore, there is a need for HLIs to explore increased technological opportunities for online assessment. Abdul Rahim, (2020) proposes prerequisites for online assessment which include proper alignment of assessment activities with stated learning objectives, addressing the diversity of students' situations, stimulating student learning with online assessment, establishing clear communication to students regarding assessment matters, ensuring high-quality feedback and addressing assessment validity threats. By becoming more aware of the prerequisites for online assessment, many instructors in HLIs could capitalize on them for effective and sustainable transformation to digital culture which would enhance effective growth of more digital natives. Whatever is planned in online assessment, there is a need to ensure that the assessment strategies are safe, valid, reliable, acceptable, feasible and fair (Sajjad et al., 2018). Strong learning management systems that support SDL among learners should be put in place for sustainable online assessment.

The literature indicates that there are still many challenges facing e-learning in HLIs which are not limited to: course development, assessment, learner support, institutional factors, user characteristics and overall performance (Hadullo et al., 2017). Indeed, Mtebe and Raphael (2018) reviewed 74 articles in Tanzania on e-learning implementation. It was found that 45 articles outlined several challenges hindering e-Learning implementation which included lack of Internet connectivity (30%) which was the most highly ranked barrier, followed by lack of support (25%) and lack of awareness and negative attitude towards ICT (21.7%) while lack of policies, lack of facilities, and inadequate funds were the least-ranked barriers to e-Learning implementation in Tanzania.

Moreover, Mutisya and Makokha (2016) assessed challenges for adoption of e-learning in HLIs in Kenya and found that students ranked insufficient Internet connectivity the number one challenge. This was followed by: lack of computers/laptops, inadequate computer laboratories, limited ICT skills, and insufficient time for online interaction. We are at the curious time where students need to have better ICT skills to cope with the needs of the 21<sup>st</sup> Century skills but the situation can be very intimidating. There are several open technological resources already in use which can support students' online formative assessment as one of the key skills needed for the 21<sup>st</sup> century. Yet, the prevalence of many challenges generates several stumbling blocks to the 21<sup>st</sup> Century skills acquisition in most of the HLIs in Tanzania. These include low accessibility of online resources, poor learning management systems, and unreliable internet (Ndibalema, 2020). Online assessment as one of e-

learning strategy appears to face multiple challenges which may need deliberate measures to curb them. In this digital age, it sounds logical if HLIs dedicate more resources towards technology for proper acquisition for 21<sup>st</sup> century skills among students.

The analysis from students' responses also revealed some worries about online assessment that may lead to academic dishonesty. Some respondents strongly articulated with concerns that online assessment attracts cheating and plagiarism. The results from this analysis provide evidence that there is a high chance for academic dishonesty through online assessment. According to Gamage, de Silva and Gunawardhana (2020) the invigilated assessments, often considered as more secure while in online assessment detecting any cheating would be significantly challenging. It has been noted that students who are not under direct super-vision have the opportunity to engage in activities such as collusion with others and reference to inappropriate materials during the assessment, which brings the academic integrity of the assessment process into question (James, 2016). From such a view point, Mellar et al., (2018) conducted the research on cheating in e-assessment. They found cheating and plagiarism as major problems, and the use of e-assessment was seen as exacerbating the problem. The prevalence of high rate of cheating through online assessment exemplifies the misconceptions and worries towards the online assessment.

While many researchers are trying to address the critical challenges of online assessment, they recognise and value its contributions on students' learning. There is a good reason to believe that the limitation for adoption of online assessment is grounded on multiple factors including lecturers' readiness in HLIs. A good example can be seen during the outbreak of COVID-19 pandemic where most HLIs experience closure and little evidence exists on the continued online learning and assessment. It has been noted that during COVID-19 pandemic outbreak, most teachers and instructors were largely unprepared to support continuity of learning and adapt to e-learning strategies including online assessment (Wayne et al., 2020). The NILOA COVID-19 survey on changes made on assessment indicates that about 75% of the respondents felt the changes would not negatively impact the assessment culture of their institution but the 25% respondents were worried about increased work demands, shifting assessment further away from teaching and learning, and accuracy of measures of learning (Jankowski, 2020). In the study conducted in Mizoram University in India by Mishra et al. (2020), it was revealed that students responded negatively to the understanding of online classes to sufficiently understand the conceptual knowledge and discourse activities. It was further revealed that they were not able to maintain the pace of their learning behaviour or capacity with the teachers' teaching speed Mishra et al., (2020). In another study by Guangul et al., (2020) it was found that during COVID-19 pandemic most students reported that the main challenges for remote assessment were academic dishonesty, infrastructure, coverage of learning outcomes, and commitment of students to submit assessment. However, what is important is that, when migrating to online formative assessment, there is a need to consider several uncertainties so as to ensure effectiveness and efficiency. Focusing on this, Tuah & Naing, (2021) recommend the consideration of readiness among students and instructors, cheating practices and student diversity when employing online assessment at HEIs.

A critical review on factors for e-learning adoption in HLIs in Malawi by Kayange (2019) reveals poor



accessibility of the internet, poor enforcement of ICT policies, inefficient technological infrastructure, prevalence of highest computer illiterate rate causing a lot of complications in ICT integration in teaching, just to mention a few. An empirical assessment of e-learning adoption in Tanzania between private and public HLIs by Mwamahusi and Tossy (2017) reveals that, despite the government's efforts to support e-learning initiative by introducing national ICT policies to boost the level of adoption; very few private HEIs have adopted e-learning compared to public HEIs. It has been found that limited adoption of e-learning strategies including online assessment is influenced by a number of factors which include limited initial investment, lack of expertise, lack of guaranteed electrical power, poor strategic change management plans, and lack of innovative ideas as barriers to e-learning adoption (Mtebe & Raphael, 2018; Mwamahusi & Tossy, 2017; Ndibalema, 2020). Unlike other studies, Kisanjara (2020) revealed that e-learning adoption in HLIs in Tanzania is significantly influenced by technological characteristics, user characteristics, pedagogical characteristics, social attributes and environmental characteristics. Given the complexity of factors limiting the proper adoption of e-learning, there is no doubt that online assessment in HLIs is still at infancy stage in most of the HLIs in the developing countries. Alharthi (2019) concludes that Universities should stress on developing technological skills among instructors and encourage them to diversify educational activities during content delivery in order to meet the diverse learning needs of the learners. On this, even the online assessment must be designed in such a way that it addresses multiple skills needed in the 21<sup>st</sup> century. The factors discussed endorse the view that most HLIs especially in developing countries have not adopted online assessment significantly and thus, questions remain about how students are prepared to cope with the learning needs for 21<sup>st</sup> century skills of which SDL is one of the most emphasized skills. Given the challenges most HLIs face in online assessment and virtual learning environment, there is a need for critical consideration in providing a stable Internet connection, technological facilities and learning management systems.

## **Conclusions and Recommendations**

The overall implication of the findings in this paper suggests that the adoption of online assessment in education in most HLIs in developing still lags behind. Most educators and learners need to be critically convinced on the suitability and benefits of online assessment. Research in the area of online assessment tends to focus on institutional and infrastructural inhibitive factors with less attention to individual and ethical factors. The results from this paper suggest that formative online assessment provides multiple opportunities for students' learning and instructors' professional growth. Therefore, there is a need for an increased opportunity for students to engage in formative online assessment. Such opportunities may enhance students' skills needed for 21<sup>st</sup> century. Self-directed learning (SDL) skills and optimistic online assessment attitudes would be very critical in the 21<sup>st</sup> century where most learners in HLIs are digital natives.

To achieve a significant transformative change in learning through online assessment, the capacity building to both instructors and students is inevitable. It is also essential to harmonize the curriculum by capitalizing on the integration of online formative assessment to support blended learning strategies which aims to enhance lifelong learning. To achieve these, deliberate institutional efforts are to be put in place to create integrated technological supportive learning environment that supports the diverse learning needs through online assessment. Further

research may be conducted to assess the psychological effects of online assessment involving larger sample. A survey study may also be conducted to assess how the learning curriculum in HLIs aligns with e-learning policies in the nation and within the institutions. A narrative research may be conducted to explore how formative online assessment meets the learning demands for digital native students at other levels of education.

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