Green Skills and Sustainable Economy in Kenya: The Influence of TVET Trainer Competencies

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Abstract

Greening Technical and Vocational Education Training (TVET) is an initiative of the United Nations Educational, Scientific and Cultural Organization (UNESCO) together with, the International Centre for the Technical and Vocational Education and Training (UNEVOC) that requires Technical and Vocational Educational Training Institutions to provide knowledge and develop skills that ease transition to green economies and societies. In an effort to attain the Sustainable Development Goals, the Kenyan government has revamped TVET institutions with both human and non-human resources. There is no doubt that green skills hold the future for sustainable economies, however, the role of trainers cannot be gainsaid. The study analyzed the influence of trainers' competencies on the relationship between green skills and sustainable economy. The study adopts the 'ex-post facto' design based on the post-positivist paradigm to sample 200 pre-existing technician graduates drawn from Uasin Gishu County. Data was collected using questionnaires and structured interview schedule which yielded both quantitative and qualitative data for analysis. Descriptive and inferential analyses revealed that the four green skills namely attitudes, values, knowledge and technical skills positively and significantly predicted sustainable economy. There is therefore need to focus on building the capacity of TVET trainers in order to inculcate the required green skills among trainees. This will largely contribute to enhancing sustainable development competences and thus implementing the Sustainable Development Goals for green economies and societies.

Key words: *Green skills, sustainable economy, trainer competencies, SDGs*

Introduction

Electronic assessment, also known as E-assessment is the use of technology to manage and deliver assessments which vary from multiple choice quizzes to essay based questions. The continuous evolution of Information and Communication Technologies (ICT's) has led to massive growths in the variety of Internet-tools which can be widely used in teaching, learning and research. Some of this internet tools have widely penetrated in terms of use and acceptance while others have merely been applied in the education sector. Barnett et al. (1997) in his literature provided an overview introduction to some of the technologies used in learning and their role within institutions of higher learning. Association of Learning

Technology in their recent report provided contextualized overview of the main e-learning tools which can be used in embracing learning technologies. Some of the common forms of e-assessments include; Multiple choice, True/false and yes/no, Multiple selection or multiple response, Matching, Sequencing/ordering, Short answer and Hotspot. The tremendous growth of the internet has lead to the evolution of what is generally termed as Electronic learning (E-learning) which has become the most revolutionary learning tools since the inception of the world wide network and the internet (Whitelock et. al., 2006).

E-learning has greatly facilitated in the introduction of online course delivery, blended learning, distance learning, live virtual classrooms as well as course material development for practical and theory lessons. In its essence E-learning introduces the advantage flexibility in terms of time and distance and thus creating universal, learning-on-demand opportunities for the concerned learners (whitelock et al, 2006). In this information society era where most of a country's citizens are digitalized, the learning curve spans from childhood to adulthood. Online learning therefore comes in handy and thus there is a need to looks at ways in which learner assessment can be done in a more amicable way. Electronic assessment deals with ways in which a trainer uses electronic devices such as an online computer connected to a network.

Literature Review

Traditional assessment methods sometimes dampen teaching and inaccurately measure students learning especially in large classes. Ruben- stein (2008) says the solution is to build a better assessment; tests that are more complex assessments, this will paint a clearer picture of student learning and the assessments to measure skills so urgently is needed in the TVET curricula.

Today we live in an information society, where most of its citizens are digitized and thus computers have become one of the important revolution tools in this information era. Massive developments in computing devices and integrated computer network systems have given birth to the Internet which is a mash up of networks of networks. Through the internet information broadcasting has become quick, easy and cheap making it an alternative medium of communication in education.

As the World Wide Web becomes a popular platform, with its expansion to include a large variety of online applications, it seems only beyond words that education becomes one of them. With the increased opportunities offered by the growth of the worldwide web, the education sector should not overlook such golden opportunities. The number of learners in a lecture has rapidly grown to a number that can satisfactorily fit into a classroom to a chunk number of learners with access to e-learning enabled users equipped with web enabled computers. The ability to provide quality education to a big number of learners is within our reach. Godwin

& Goldberg (2014) asserts that the field of online learning is a few years old and that several people are working to develop useful and marketable systems for online course delivery with some notable examples including Moodle and Web Course in a Box.

Schneider (2000) states that if electronic assessment is to become an established practice within e-learning, the need for re-strategy will increase greatly, this is because traditional assessment methods dampen teaching and inaccurately measure students learning. Ruben- stein (2008) says the solution is to build a better test; tests that are more complex assessments, could paint a clearer picture of student learning and be the assessments to measure skills so urgently needed in the TVET curricula.

Problem Statement

With continued use of E-learning and increase in computer based assessment, it is indeed important to understand learner perception towards e-assessment and its impact in the learning process as well as facilitating how improvements can be made in regards to the User interface. With continued digital revolution, E-learning has greatly contributed to wide use of online teaching but so far, E-assessment has not been widely embraced. This could have contributed to efficiency in teaching, learning and assessment and; lack of adequate training on e-assessment could be another point of concern.

Assessment is one of the key roles of any TVET institution as a way of measuring student understanding and certifying learning outcomes. The changing approaches in technical education has led to introduction of blended teaching approaches, advent of Moodle and other e-learning platforms has led to flexible modes of delivery.

Modern technologies have improvised how curriculum can be deliberated and delivered nevertheless currently there are few approaches to e-assessment. These technologies need to be learner centred and therefore should incorporate the aspect of authentic assessment tasks which are now used to drive curricula and provide more analysis and increased synthesis of information (Ojunga et al, 2017). This paper addresses an evaluation of electronic assessment tools that are in use. It identifies the user interface issues that can be addressed as well as a couple of system use concerns. It identifies the need for constant feedback from the users of the system in order to improve electronic assessment.

Research Objectives

 i. Establish how students view the e-assessment website pages user interface
 ii. Find out how system use of the e-assessment site contribute to overall usability
 iii. To determine student perception towards online assessment.

Research Methodology

Qualitative research was used as a research methodology to establish the various e-assessment tools that are commonly used in learning institutions as well as to Identify challenges facing trainers in implementing e-assessment and strengths of e-assessments in learning institutions

Questionnaires were used as a data collection tool to obtain data from 46 students on their views on e-assessment in learning based on User Interface and System Use Perspective. The sample was selected purposively from a population of students who had been exposed to e-assessment.

Findings

Evaluation of the Overall Structure of the User Interface

Table 1
Students View the E-assessment Website Pages user Interface in Terms of Overall Structure

Items	Mean	SD
The overall structure and functional levels of system are clear and easy	3.77	0.86
The overall interface is normal and pleasant for the system	3.79	0.75
The screen layout design of the system is suitable	3.96	0.72
The overall interface operation method is easy and appropriate	3.52	1.03

Evaluation of the Login Interface

Table 2
Students View the E-assessment Website Pages user Interface in Terms of the Login

Items	Mean	SD
The Login interface is not ambiguous	3.62	1.07
The Login interface design is relevant	3.87	0.86
The register interface design is appropriate	3.80	0.79

Evaluation of the Exam Interface

Table 3
Students View the e-assessment Website Pages User Interface in Terms of the Exam Interface

Items	Mean	SD
The exam interface is clear and easy for first time users.	3.89	0.86
The exam interface design is appropriate	3.70	0.87
Results interface is clear and easy to comprehend	3.84	0.81
The grading interface and its computational methods is easy	3.73	0.87
Results interface is appropriate	3.96	0.93

From the above Tables 1, 2 & 3 it is noted that the acceptance mean of the respondents is quite high at 3.80 with most all deviations are less than 1.00. The standard deviations therefore indicate that majority of the respondents are in agreement or have common thoughts in terms of the user interface of the e-assessment website. From the results of this research work, it can be summarized that the overall functionalities of the system are clear and easy to predict, the overall configuration of colors and background, the overall layout of screen and interface design, and overall window operation method, had high acceptance values. In addition, the evaluation of the appropriateness of screen design and ease of use of the interface design both score highly and average wise.
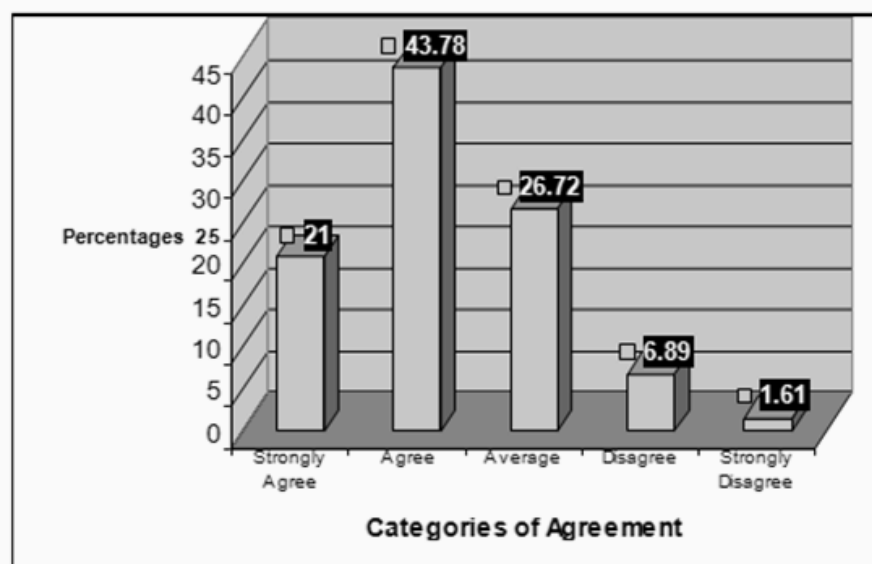

Figure 1 : The distribution of means for student agreement percentages in e-assessment system "User interface evaluation"

Table 4 displays the aspect of system use with items running from 1-9.The means lie between 3.50 and 4.17 with standard deviations having values which are below 1.Therefore it can be deduced that majority of the respondents have similar agreement levels about system use. This shows that respondents or rather the users operated the site pages without any major difficulties. 17% of the respondents indicated that the availability of the help page did not have any negative effect on the use of the electronic assessment portals. Standard deviation for the help page item was 1.97 and this shows that the answers given to this question were quite dispersed. On average 93% of the respondents thought that moving from one page to another among the web pages was easy, links were followed without any challenges, login to the system and doing the online exam was also quite easy, system was straight forward to use changes can be effected quite easily. The total mean value the overall item is near 4.00 and this high score can be attributed to initial training using sample quizzes which was taken before the real final examination.

Table 4
Ratings of Student Agreement in E-Assessment System

Evaluation of User Perception towards Online Assessment	Means	SD
There is immediate feedback form the system which is quite interesting	3.65	0.76
The online mode of exam do not make me anxious	3.21	1.35
It is much better than paper based exams	4.38	1.13
It goes hand in hand with the teaching style	3.92	0.77
Much faster because its type ad click compared to Pen and Paper	4.43	0.92
Fashionable and matches present day Technological advancement	4.33	1.04
More orderly	4.04	0.99
Quite applicable to other courses	3.85	0.94

Student Perception towards Online Assessment
This research work also sought to determine student's opinions on the electronic evaluation tool. Based on the table below majority of the users agreed that the system provided immediate feedback, 79% of the users also agreed that the online evaluation platforms provided better evaluations as compared to the paper and pencil traditional formats and that it was extremely a fast way of doing an examination. On average 82% of the users indicated that electronic evaluation was systematic and a better modern way of evaluating examinations in any learning institution. All the respondents attributed that electronic assessment was consistent with the teaching style, nevertheless 30% disagreed that they were less anxious.

Table 5
Frequencies, Percentages and Means of Student Agreement in E-Assessment System

How Users Perceive the Online Assessment Tools	Means	SD
Browsing among web pages is easy	3.88	0.82
Navigating from one page to another is quite easy	4.17	0.91
Registering on the online portal is quite easy	4.17	1.05
Doing an exam on the platform is an easy task	4.19	0.92
Correcting work is easy	4.04	0.79
Flexibility when using online assessment	4.08	0.88
Easy to visit previous exam pages	3.85	0.92
The help page helped my navigation on the site	3.53	1.97
Time left command aids in finishing exam	3.97	1.07

Conclusion

E-assessment provides an interesting case for the use of comparative judgement delivered through online technologies as a viable, valid and reliable alternative to traditional pen and paper assessment. This paper describes students' perception of the potential of e-assessment to improve learning on e-assessment design approach in terms of User Interface and System Use Perspective. There is need to provide prior sample assessments to create awareness before exposing students to the real exam.

Recommendations

Trainers are encouraged to employ powerful internet tools alongside other technologies to asses students instead of setting authentic exams that are only pen and paper.

The use of electronic assessment requires the lecturer/course tutor to closely cooperate with the ICT units or the E-learning department.

The setting up of initial quizzes also requires a little bit of extra effort in order for one to utilize the incoming and continuous profits. The quizzes should also measure the intended level of in-depth knowledge and assessment. Therefore, institutions need to come up with methods of motivating lecturer to use e-assessment instead of pen and paper.

E-learning departments should be introduced in all institutions and their heads should steer the development of E-assessment champions within every department in the institution. Institutions should motivate its members to use e-assessments especially for large classes.

For electronic assessment to be efficient, a deep research into a detailed feedback system needs to be strengthened.

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