The Impact Of Information And Communication Technology In Educational Assessment In Tanzania: Case Of National Examinations Council Of Tanzania

Madhu Mshangi

Abstract: This study explored the impact of information and communication technology (ICT) in educational assessment: Case of National Examinations Council of Tanzania (NECTA). Four hypotheses were formulated for this study with questionnaire(s), interview(s) and observation(s) as the main instruments for data collection. The data obtained were analyzed using Regression analysis. The finding from this study revealed that the impact of ICT in educational assessment is explained by the impact of accessibility of ICT infrastructure, affordability of ICT infrastructure, reliability of ICT infrastructure and efficiency of ICT infrastructure.


1. INTRODUCTION
Information and communications technology or information and communication technology, usually abbreviated as ICT, is often used as an extended synonym for information technology (IT), but is usually a more general term that stresses the role of unified communications and the integration of telecommunications (telephone lines and wireless signals), computers, middleware as well as necessary software, storage and audio-visual systems, which enable users to create, access, store, transmit, and manipulate information. In other words, ICT consists of IT as well as telecommunication, broadcast media, all types of audio and video processing and transmission and network based control and monitoring functions (WEKIPEDIA, 2013) [21]. The National Examinations Council of Tanzania (NECTA) is the government institution which was established by the Parliamentary Act No. 21 of 1973. NECTA is responsible for the administration of all National Examinations in Tanzania. In August 2005, the Government of the United Republic of Tanzania in collaboration with the Swedish Government through the Swedish International Development Cooperation Agency (Sida) initiated a project for introducing ICT in all government teachers’ colleges (MoEVT, 2007) [7].

MoEVT has changed the curriculum for basic education (primary schools, secondary schools, teachers colleges) in order create environment for introducing ICT as teaching subject at teachers college, secondary school and primary school level (MoEVT, 2008, 2009 & 2011) [8],[9],[10]. NECTA in collaboration with the Ministry of Education and Vocational Training (MoEVT) has initiated various ICT Projects leading to the use of ICT in education sector. One of the interesting projects initiated by NECTA is the use of ICT in secondary school, teachers colleges, primary school for registrations of candidates for different examinations. NECTA is offering number of services electronically such as marking of Primary school examinations by using OMR (Optical Mark Recognition) technologies, online registration; collection of continuous assessments electronically, dissemination of examination results through NECTA website, SMS-service for results notifications.

2. EDUCATIONAL ASSESSMENT AND IMPACT OF ICT
Assessment is the systematic collection, review, and use of information about educational programs undertaken for the purpose of improving student learning and development. Assessment is an ongoing process aimed at understanding and improving student learning (Palomba & Banta, 1999) [17]. Past research (Kaffash, Kargiban1, & Kargiban, 2010) [6] has shown that integrating information communication technologies (ICT) into teaching-learning process lead to improving education assessment. The use of ICT in education sector can bring changes to the way education assessments have been done. The change have impact on assessment tasks, with new learning environments moving away from summative methods of assessment to formative approaches and open-ended products; such as reports and research papers created by groups of students (Hennessy, Harrison, Edexcel, & Wamakote, 2010) [4]. This implies that integrating ICT in education sector facilitates student centered approach learning. In order to enhance the impact of ICT in education assessment, the government of Tanzania changed the curriculum for basic education. This aimed at introducing ICT as teaching subject at

- Madhu Mshangi is currently a PhD student in Information Systems at the Faculty of Science, Technology and Environmental Studies in the Open University of Tanzania,
- E-mail: mshangimaduhu@yahoo.com
The use of ICT in education has improved educational assessment; this helps students to develop their skills. An emerging body of evidence suggests that e-Learning can deliver substantial positive effects: students are more engaged and able to develop skills; teachers have a more positive attitude toward their work and are able to provide more personalized learning (Intel Educational Transformation, 2012) [5]. Past research (Eng, 2005) [1] has shown positive effect on school achievement for higher usage levels of ICT (based on pupil estimates of ICT activity) were found both at the level of the individual pupil and at the level of the school, although these were not large.

3. OBJECTIVE OF THE STUDY
The general objective of this study was to explore the impact of information and communication technology in educational assessment in Tanzania: case of National Examinations Council of Tanzania. The specific objectives examined in this study are as follows:
(i). To examine the impact of accessibility of ICT infrastructure in educational assessment in Tanzania
(ii). To investigate the impact of affordability of ICT Infrastructure in educational assessment in Tanzania.
(iii). To investigate the impact of reliability of ICT infrastructure in educational assessment in Tanzania.
(iv). To explore the impact of efficiency of ICT infrastructure on education assessments in Tanzania.

4. CONCEPTUAL FRAMEWORK
The developed model depicts that the impact of ICT in education assessment is the function of accessibility, affordability, reliability and efficiency of ICT infrastructure.

TABLE 1
PERFORMANCE IN ICT/TEHAMA SUBJECTS FOR GATCE/DSEE

<table>
<thead>
<tr>
<th>Year</th>
<th>ICT</th>
<th>TEHAMA</th>
</tr>
</thead>
<tbody>
<tr>
<td>2012</td>
<td>8,160</td>
<td>10,213</td>
</tr>
<tr>
<td>2013</td>
<td>4,875</td>
<td>14,106</td>
</tr>
<tr>
<td>2011</td>
<td>3,751</td>
<td>10,723</td>
</tr>
<tr>
<td>2010</td>
<td>2,574</td>
<td>13,953</td>
</tr>
</tbody>
</table>


Hypothesis and explanations
Based on the literature review carried out and the proposed conceptual framework (Figure 1); the following hypotheses have been formulated:

Hypothesis one: the impact of accessibility of ICT infrastructure in educational assessment.
H1: The higher the accessibility of ICT infrastructure the greater the impact of ICT in educational assessment.

Hypothesis two: the impact of affordability of ICT infrastructure in educational assessment.
H1: The higher the affordability of ICT infrastructure the greater the impact of ICT in educational assessment.

Hypothesis three: the impact of reliability of ICT infrastructure in educational assessment.
H1: The higher the reliability of ICT infrastructure the greater the impact of ICT in educational assessment.

Hypothesis four: the impact of efficiency of ICT infrastructure in educational assessment.
H1: The higher the efficiency of ICT infrastructure the greater the impact of ICT in educational assessment.

5. METHODOLOGY
5.1. The sampling, design and procedures
The sample for study comprised of all candidates studied ICT/TEHAMA for the past six years (2008-2013) for DSEE/GATCE (table 1); 400 respondents (students, tutors, ICT experts, examinations officers) drawn from 14 teachers colleges; and ICT experts, examinations officers from NECTA.
TABLE 2
SAMPLE FOR THE STUDY OF IMPACTS OF ICT IN EDUCATION ASSESSMENT

<table>
<thead>
<tr>
<th>S/N</th>
<th>ICT users</th>
<th>Institution</th>
<th>Respondents</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Students taking ICT/TEHAMASA</td>
<td>Teachers</td>
<td>3:25</td>
</tr>
<tr>
<td>2</td>
<td>Tutors teaching ICT/TEHAMASA</td>
<td>College(s)</td>
<td>14</td>
</tr>
<tr>
<td>3</td>
<td>College ICT Experts</td>
<td>12</td>
<td></td>
</tr>
<tr>
<td>4</td>
<td>ICT experts from ICT department</td>
<td>NECTA</td>
<td>25</td>
</tr>
<tr>
<td>5</td>
<td>Examinations Officers</td>
<td>24</td>
<td></td>
</tr>
<tr>
<td></td>
<td>Grand Total</td>
<td>400</td>
<td></td>
</tr>
</tbody>
</table>

TABLE 3
TEACHERS COLLEGES INVOLVED IN THE STUDY

<table>
<thead>
<tr>
<th>S/N</th>
<th>College Name</th>
<th>Location</th>
<th>Students registered for DEE/GATCE May 2013</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>ICT/TEHAMASA</td>
<td></td>
<td>DEE/GATCE/Tehama Sample</td>
</tr>
<tr>
<td>1</td>
<td>KIBANIBA T.C</td>
<td>Dar es Salaam</td>
<td>61</td>
</tr>
<tr>
<td>2</td>
<td>MEBAD T.C.</td>
<td>Dar es Salaam</td>
<td>5</td>
</tr>
<tr>
<td>3</td>
<td>EBONTE T.C.</td>
<td>Dar es Salaam</td>
<td>10</td>
</tr>
<tr>
<td>4</td>
<td>PARADIGM T.C</td>
<td>Dar es Salaam</td>
<td>12</td>
</tr>
<tr>
<td>5</td>
<td>KINDERCARE T.C</td>
<td>Dar es Salaam</td>
<td>7</td>
</tr>
<tr>
<td>6</td>
<td>SAFMAT T.C.</td>
<td>Dar es Salaam</td>
<td>40</td>
</tr>
<tr>
<td>7</td>
<td>UNITRO T.C.</td>
<td>Dar es Salaam</td>
<td>15</td>
</tr>
<tr>
<td>8</td>
<td>KINCHONI T.C</td>
<td>Dar es Salaam</td>
<td>24</td>
</tr>
<tr>
<td>9</td>
<td>ST. MARKS T.C</td>
<td>Dar es Salaam</td>
<td>4</td>
</tr>
<tr>
<td>10</td>
<td>WEST DAR ES SALAAM T.C</td>
<td>Dar es Salaam</td>
<td>167</td>
</tr>
<tr>
<td>11</td>
<td>GREAT T.C.</td>
<td>Pwani</td>
<td>6</td>
</tr>
<tr>
<td>12</td>
<td>VIKOBO T.C.</td>
<td>Pwani</td>
<td>40</td>
</tr>
<tr>
<td>13</td>
<td>MOROGORO T.C</td>
<td>Morogoro</td>
<td>873</td>
</tr>
<tr>
<td>14</td>
<td>MHONDA T.C.</td>
<td>Morogoro</td>
<td>50</td>
</tr>
</tbody>
</table>

(Source: NECTA, 2013)

5.2. Designing the questionnaire
The questionnaire research questions were designed based on the Likert-style rating scale with a rating scale of 5 point rating; from 1 (strongly disagree) to strongly agree (5); or from 1 (above 5 times) to 5 (none at all).

6. RESEARCH FINDINGS
This section presents the findings of the research about the impact of accessibility of ICT infrastructure, affordability of ICT infrastructure, reliability of ICT infrastructure and efficiency of ICT infrastructure in educational assessment.

6.1. The impact of accessibility of ICT infrastructure in educational assessment

Using overhead projector for presentations in the classroom
The analyzed data reveals the views when the respondents were asked whether overhead projector should be used in classroom for presentations. Over 50.7% (strongly agree, agree) of the respondents revealed that overhead projector should be used in classroom for presentation so as to enhance educational assessment. Groot (2002) [3] found that the use of projector(s) affected the teaching and learning experience, several areas of influence were identified, including visual aid, greater flexibility for alternative teaching methods, enhanced teacher demonstrations, heightened student awareness and customized curriculum applications. With the use of projector(s) in the classroom, students can take better notes with the ability to discern what information the teacher displays is most useful to them. The presentations made can be projected on to a big screen. The use of overhead projector help every student to view information on the screen without any problem; as result it is easy for student to learn.

Using social networks: Facebook, Twitter, YouTube; and internet
The analyzed data reveals the views when the respondents were asked whether internet access and social networks should be used for education assessments. Among of them 49.8% of respondents were undecided (moderate) whether social networks should be used for education assessment; and 0.8% of them agreed that social networks should be used for education assessment. Past research (Ronélle, 2010) [18] shown that the use of social networks enables educational organizations to more easily share information and with each another and jointly make it accessible to users, such as researchers, students, teachers and the general public. Institutions are able to share their knowledge and collections to those of professional organizations. This result portrays that social network and internet access should be used for educational assessment with precaution in order to counter-balance the challenges associated with.

Access to television and radio program for learning
The analyzed data reveals the views when the respondents were asked whether students/teachers should have access to television/radio program for learning. Over 99.8% (agree) of the respondents revealed that students/teachers should have access to television/radio program for enhancing educational assessment.

6.2. The impact of affordability of ICT infrastructure on education assessment

The cost of buying projector(s) for presentations in classroom(s)
The analyzed data reveals the views when the respondents were asked whether the cost of buying overhead projector and other devices for presentation(s) is less expensive. Over 89% (strongly disagree, disagree) of the respondents revealed that most of colleges/institutions cannot afford to buy overhead projector(s) and other devices required for presentation(s). This implies that if the price is not affordable; less colleges/schools will own the Projector(s) hence the impact of ICT on educational assessment is minimal.
The cost of buying mobile devices and application software’s for educational assessment

The analyzed data represents the views when the respondents were asked whether cost of buying mobile devices such as cellphone(s), computer(s) and application software for educational assessment is less expensive. Over 97% (strongly disagree, disagree) of the respondents revealed that most of colleges/institutions cannot afford to buy mobile devices and application software’s for educational assessment. The lower the cost of buying computing devices and application software(s) the greater the impact of ICT in educational assessment; more of them will have purchasing power.

The cost of LAN/WAN/internet connectivity and bandwidth

The analyzed data reveals the views when the respondents were asked whether cost of LAN/WAN/internet connectivity and bandwidth for education assessment is less expensive. Majority of the respondents revealed that it is expensive to have LAN/WAN/Internet connectivity and bandwidth for education assessment; and this is depicted by 92.2% (strongly disagree, disagree) of the respondents. Lower cost, lead to greater impact of ICT in educational assessment; more of them will afford to use the LAN/WAN/internet.

6.3. The impact of reliability of ICT Infrastructure in educational assessment

Internet/information systems connectivity problem

The analyzed data reveals the views when the respondents were asked how many times per week the internet/information systems are not working. Over nine tenth of the respondents revealed that internet/information systems are not working; 1-2 times to above 5 times per week due to connectivity problem. The availability of reliable internet/information systems connectivity leads to impact of ICT on educational assessment; the systems are available for use when required.

Power interruptions to internet/information systems

The analyzed data reveals the views when the respondents were asked how many times per week the internet/Information Systems are not working due to power interruption. 100% of the respondents revealed that internet/information systems are not working; 3 times to above 5 times per week due to power interruptions. Mshangi (2007) [11] found that power failure and information connectivity problems; very much hinder respondents’ accessibility to information systems. This implies that the availability of reliable power supply lead to impact of ICT in educational assessment; information systems is used when required.

Information systems not working due to computer failure (hardware/software)

The analyzed data reveals the views when the respondents were asked how many times per week the internet/information systems are not working due to failure in hardware/software. 100% of the respondents revealed that information systems are not working; 1-2 times to above 5 times per week due to failure in hardware/software. This implies that the availability of reliable hardware/software lead to impact of ICT in educational assessment; information systems is used as needed.

6.4. The impact of efficiency of ICT infrastructure in educational assessment

Speed of accessing training materials through LAN/WAN

The analyzed data reveals the views when the respondents were asked whether the speed of accessing training materials through LAN/WAN/internet is very fast. Majority of the respondents revealed that the speed of accessing training materials through LAN/WAN for education assessment is not very fast; and this is depicted by 50.2% (disagree) of the respondents. This implies that the high the speed of LAN/WAN lead to impact of ICT in educational assessment; training materials is accessed at high speed.

The use of ICT facilitates preparation and dissemination of results

The analyzed data reveals the views when the respondents were asked whether the use of ICT facilitates easy preparation and dissemination of examinations results for student. Majority of the respondents revealed that the use of ICT facilitates preparation and dissemination of results; and this is depicted by 100% (agree) of the respondents. This implies that use of ICT for preparation and dissemination of results have impact in educational assessment.

The use of ICT in educational assessment minimize examination malpractices (misconducts)

The analyzed data portrays the results when the respondents were asked whether the use of ICT in educational assessment minimizes malpractices in the examinations. Majority of the respondents revealed that the use of ICT in educational assessment minimizes malpractices for educational assessment; and this is depicted by 100% (agree, strongly agree) of the respondents. Students can be identified using biometric technology such as fingerprints, including photo of student in their certificates; the use of ICT minimizes examination malpractices.

6.5. The impact of Information Communication Technology (ICT) in educational assessment

The use of ICT facilitates collection of information for education assessment

The analyzed data portrays the results when the respondents were asked whether the use of ICT facilitate collection of information for education assessment. Majority of the respondents revealed that the use of ICT facilitates collection of information for education assessment; and this is depicted by 100% (agree, strongly agree) of the respondents. The use of ICT facilitates the collection of information for educational assessment.
The use of ICT facilitates self-assessment, peer assessment and instant feedback
The analyzed data portrays the results when the respondents were asked whether the use of ICT facilitates self-assessment, peer assessment and instant feedback for education assessment. Majority of the respondents revealed that the use of ICT facilitates self-assessment, peer assessment and instant feedback for education; and this is depicted by 92.3% (agree, strongly agree) of the respondents. The use of ICT facilitates self-assessment, peer assessment and instant feedback for educational assessment.

The use of ICT improves students learning
The analyzed data portrays the results when the respondents were asked whether the use of ICT improves student learning. Majority of the respondents revealed that the use of ICT improves student learning; and this is depicted by over eight tenth (agree, strongly agree) of the respondents. The use of ICT facilitates self-assessment, peer assessment and instant feedback for educational assessment.

The use of ICT enhance creation and management of digital portfolio
The analyzed data portrays the results when the respondents were asked whether the use of ICT enables students/teachers to create and manage digital portfolio. Majority of the respondents revealed that the use of ICT enables students/teachers to create and manage digital portfolio; and this is depicted by over nine tenth (agree, strongly agree) of the respondents. The use of ICT enhances creation and management of digital portfolio for students/teachers.

7. ANALYSIS AND INTERPRETATION
Analysis of impact of ICT in educational assessment The results from table 4 (Model regression summary) reveal coefficient of correlation (R) = 0.835 which implies that there is a positive impact of accessibility of ICT infrastructure, affordability of ICT infrastructure, reliability of ICT infrastructure, efficiency of ICT infrastructure in educational assessment. And the coefficient of determinations(R square) = 0.697=69.7%. This means that 69.7% in the variations of the Impact of Information Communication Technology (ICT) in educational assessment are being explained by the impact of accessibility of ICT infrastructure, affordability of ICT infrastructure, reliability of ICT infrastructure and efficiency of ICT infrastructure; the remaining 30.3% being explained by other variables not considered in this case.

<table>
<thead>
<tr>
<th>Model</th>
<th>R</th>
<th>R Square</th>
<th>Adjusted R Square</th>
<th>Std. Error of the Estimate</th>
<th>R Square Change</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>.835</td>
<td>.697</td>
<td>.694</td>
<td>.290</td>
<td>.697</td>
</tr>
</tbody>
</table>

The impact of ICT in educational assessment is expressed as:
\[ Y = \beta_0 + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \beta_4 X_4 + \epsilon \]

Where \( X_1, X_2, X_3 \) and \( X_4 \) representing the impact of accessibility of ICT infrastructure, affordability of ICT infrastructure, reliability of ICT infrastructure and efficiency of ICT infrastructure respectively; \( Y \) represents the dependent variable: impact of information communication technology in educational assessment; and \( \beta_1, \beta_2, \beta_3 \) and \( \beta_4 \) are regression coefficients, \( \beta_0 \) is the Y-intercept and \( \epsilon \) is error term. These have been calculated by using regression analysis in SPSS as revealed in the Table 5. From this table the value for, \( \beta_1, \beta_2, \beta_3 \) and \( \beta_4 \) are 0.186, 0.218, 0.351 and 0.743 respectively and \( \beta_0 \) is -1.215.

From the table 5, the regression line is given by
\[ Y = 0.186X_1 + 0.218X_2 + 0.351X_3 + 0.743X_4 -1.215 \] (eq1).
TABLE 5
Coefficient

<table>
<thead>
<tr>
<th>Model</th>
<th>Unstandardized Coefficients</th>
<th>Standardized Coefficients</th>
<th>Sig. (p)</th>
<th>Hypothesis Supported (p&lt;0.05)</th>
<th>95% Confidence Interval for B</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>(Constant)</td>
<td>.125</td>
<td>.317</td>
<td>3.837</td>
<td>.000</td>
<td>-1.837 - .592</td>
</tr>
<tr>
<td>accessibility of ICT infrastructure</td>
<td>.186</td>
<td>.033</td>
<td>1.60 5.558</td>
<td>.000</td>
<td>.120 - .251</td>
</tr>
<tr>
<td>affordability of ICT infrastructure</td>
<td>.218</td>
<td>.046</td>
<td>1.52 4.727</td>
<td>.000</td>
<td>.127 - .309</td>
</tr>
<tr>
<td>reliability of ICT infrastructure</td>
<td>.351</td>
<td>.070</td>
<td>.145 5.000</td>
<td>.000</td>
<td>.213 - .489</td>
</tr>
<tr>
<td>efficiency of ICT infrastructure</td>
<td>.743</td>
<td>.032</td>
<td>.710 23.19</td>
<td>.000</td>
<td>.680 - .806</td>
</tr>
</tbody>
</table>

Note: Dependent Variable: impact of ICT in educational assessment

TABLE 6
CORRELATION

<table>
<thead>
<tr>
<th>Pearson Correlation</th>
<th>impact of ICT in education assessment</th>
</tr>
</thead>
<tbody>
<tr>
<td>impact of ICT in education assessment</td>
<td>1.000</td>
</tr>
<tr>
<td>accessibility of ICT infrastructure</td>
<td>.141</td>
</tr>
<tr>
<td>affordability of ICT infrastructure</td>
<td>.506</td>
</tr>
<tr>
<td>reliability of ICT infrastructure</td>
<td>.272</td>
</tr>
<tr>
<td>efficiency of ICT infrastructure</td>
<td>.786</td>
</tr>
</tbody>
</table>

8. TESTS OF HYPOTHESIS
In this study, the hypotheses were tested using 5% level of significance (95% confidence interval), 95% confidence has been widely used in business and by majority of researchers; therefore making us in good position to compare the results to previous researches.

Hypothesis one: the impact of accessibility of ICT infrastructure in educational assessment
H1: The higher the accessibility of ICT infrastructure the greater the impact of ICT in educational assessment. The results from table 6, reveal that partial Pearson correlation(r) =0.141; which implies that there is a positive impact of accessibility of ICT infrastructure in the educational assessment. Since the significance level, p=0.000 which follow in rejection region; hence reject the null hypothesis at 5% level of significance level. Therefore, the test provides evidence to conclude that the higher the accessibility of ICT infrastructure the greater the impact of ICT in educational assessment.

Hypothesis two: the impact of affordability of ICT infrastructure in educational assessment
H1: The higher the affordability of ICT infrastructure the greater the impact of ICT in educational assessment. The results from table 6, reveal that partial Pearson correlation(r) =0.506; which implies that there is a strong positive impact of affordability of ICT infrastructure in the educational assessment. Since the significance level, p=0.000 which follow in rejection region; hence reject the null hypothesis at 5% level of significance level. Therefore, the test provides evidence to conclude that the higher the affordability of ICT infrastructure the greater the impact of ICT in educational assessment.

Hypothesis three: the impact of reliability of ICT infrastructure in educational assessment
H1: The higher the reliability of ICT infrastructure the greater the impact of ICT in educational assessment. The results from table 6, reveal that partial Pearson correlation(r) =0.272; which implies that there is a positive impact of reliability of ICT infrastructure in the educational assessment. Since the significance level, p=0.000 which follow in rejection region; hence reject the null hypothesis at 5% level of significance level. Therefore, the test provides evidence to conclude that the higher the reliability of ICT...
infrastructure the greater the impact of ICT in educational assessment

**Hypothesis four:** the impact of efficiency of ICT infrastructure in educational assessment

H1: The higher the efficiency of ICT infrastructure the greater the impact of ICT in educational assessment. The results from table 6, reveal that partial Pearson correlation(r) =0.786; which implies that there is a strong positive impact of efficiency of ICT infrastructure in the educational assessment. Since the significance level, p=0.000 which follow in rejection region; hence reject the null hypothesis at 5% level of significance level. Therefore, the test provides evidence to conclude that the higher the efficiency of ICT infrastructure the greater the impact of ICT in educational assessment.

**9. CONCLUSIONS**

In this study there were four hypotheses postulated; the findings revealed as follows: Hypothesis one: the higher the accessibility of ICT infrastructure the greater the impact of ICT in educational assessment; hypothesis two: the higher the affordability of ICT infrastructure the greater the impact of ICT in educational assessment; hypothesis three: the higher the reliability of ICT infrastructure the greater the impact of ICT in educational assessment and hypothesis four: the higher the efficiency of ICT infrastructure the greater the impact of ICT in educational assessment. Based on the findings in this study, it is concluded that the impact of ICT in educational assessment is the function of impact of accessibility of ICT infrastructure, affordability of ICT infrastructure, reliability ICT infrastructure and efficiency of ICT infrastructure.

**10. RECOMMENDATIONS**

Based on the findings in this study the following are recommendations made

i. The ICT/TEHAMA subject(s) should be compulsory subject(s) and examinable, as currently is optional for GATCE as revealed in table 3 (MoEVT, 2011) [10].

ii. Schools/college should have computer labs with computers connected to internet.

iii. School/college should have overhead projector(s) and other computing devices for presentation(s).

iv. Television/radio programs should be used for educational assessment.

v. The cost of buying ICT equipment’s such as computers, computer accessories, Projectors should be reduced by the government by waiving out taxes/duties for schools/colleges.

vi. The cost of LAN/WAN/Internet connectivity and bandwidth should be reduced; the government should waive out taxes/duties for schools/colleges.

vii. The cost of software for education assessment should be reduced; the government should waive out taxes/duties for schools/colleges.

**REFERENCES**


