_____***Original Research***_____

# EFFECTIVENESS OF E-LEARNING PROJECTS IN THE EMERGENCE OF NEW METHODS OF LEARNING AND TEACHING IN SECONDARY SCHOOLS IN TANZANIA

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# ABSTRACT

*This study intended to explore the effectiveness of e-learning projects enhancing learning in secondary schools in Tanzania by concentrating in some secondary schools which adopted Quest Forward project in Moshi District. Basic theories that guided this study was constructivism theory. The study employed a mixed approach research design under which participatory approach was used to gather data. The sample of the study selected was drawn by using Yamane proposed formula which gave a total of 165 respondents out of the total targeted population, part of respondents from selected sample were treated as key informants who were interviewed and the rest filled a semi-structured questionnaire. The findings showed that the Quest Forward project has largely contributed to the increase of learning resources, knowledge and information, it has impacted the schools with new methods of learning to both teachers and students and the e-learning projects including Quest Forward do prove to be sustainable and so if all the necessary conditions are met then learning will be enhanced with e-learning. The study concluded that, e-learning projects have a huge impact and contribution to the availability of learning materials and resources, it has also shown that learning methods can easily be taught and adapted with e-learning and so, duet to the positive impacts of e-learning projects, they are ought to be sustainable in bringing positive changes in education in general. Although, the project carries merits but it needs to ensure cultural preservation by making sure students cannot access other sites while in school. The researcher recommends that, more trainings providing all the necessary equipment tools in schools*
*Keywords: Quest Forward Project, ICT, E-learning, Resources, Learning tools,*

## 1. Introduction

E-learning along with ICT has a greater impact on the growth of the economic educational system of the countries (Naresh et al. 2015). Recent estimates suggest that 1.5 million elementary and secondary

students participated in some form of online learning in 2010 (Wicks 2010). Different researchers show that the presence of ubiquitous digital technologies in education provides new ways of thinking, collaboration, and communication (Olsen, 2012).  Technology with its different devices and services offers integration and a high sense of concentration and collaboration which was not reflected in the early days of learning. While developed countries have made significant strides toward integrating e-learning platforms in Higher Education, developing ones have not yet effectively adopted such technologies Ali & Magalhaes (2008). Most researches state six dominant and interrelated themes subject to the use of technology in education as (1) increased access to resources, information, and knowledge (2) the emergence of new methods of learning and teaching (3) increased effectiveness in the education system and infrastructure (4) increased student motivation (5) improvement in teacher training and teaching itself and (6) improved understanding of how to make effective use of technology (Isaacs, 2013: p. 6).

 In Tanzania, projects such as Shule Direct, Asante Africa Foundation, Ubongo Kids and others aim at reducing passive learning in our schools. There is a need for more researchers to get involved in eLearning projects research in order to inform decision makers and other stakeholders on the effectiveness of ICT integration in education in Tanzania (Mtebe, & Raphael, 2018). Various researchers including Kisanjara. et.al, (2014), Ngeze, (2017) and Mtebe (2017)., which were conducted to explore impact and contribution of e-learning in both secondary and high school learning in Tanzania, provide various delimitation which exists in implementation of ICT platform for secondary schools learners. Different challenges have been reported by projects being implemented in the schools, E-learning is effective when certain pre-conditions are fulfilled by the schools. These include: commitment & readiness of schools/teachers to integrate and use E-learning; availability of basic IT infrastructure (or readiness to invest); the employment/appointment of someone responsible for ICT (who can then be trained and made responsible for maintenance and troubleshooting); availability of a minimum number of qualified teachers; and reliable electricity.

Quest Forward is the case project for this study, and is being implemented in Tanzania. The project is implemented in secondary schools in Kilimanjaro, Arusha, Tanga, Dar es Salaam, Dodoma, and Zanzibar. The Quest Forward project is addressing e-learning through support on resources and training, to students and teachers. The project empowers students in the aspects of student-centered learning, students are capacitated through different orientation programs which helps them to become more curious and becoming value creators and so are their teachers.  However, there was limited information on how e-learning projects in Tanzania have relevantly contribute towards improving the active learning aspect, provision of resources, information and knowledge capacity, learning approaches, and sustainability aspects for those projects.

This study aimed at finding out the effectiveness of the e-learning projects in increase of learning resources, knowledge and information, their contribution in emergence of new methods of learning and teaching and opportunities for sustainability of e-learning projects in Tanzania. This study is important in finding out the contributions of e-learning projects and how government can make changes to address the needs to make e-learning experience better in the education sector.

  The researcher wanted to answer the following questions;

    i.      How did the Quest Forward project contribute to the increased access to resources, information, and knowledge in Moshi secondary schools?

    ii.      How the Quest Forward learning technology was effective in the emergence of new methods of learning and teaching in Moshi secondary schools?

    iii.      What are the opportunities for the sustainability of e-learning in secondary schools?

## 2. Literature Review.

The constructivist school of learning suggests that learners construct personal knowledge from the learning experience itself as stated in [McLeod 2003]. Thus, learning can be seen as an active process, and knowledge cannot be received from outside or from someone else. According to Duffy & Cunningham (1996), learners should be allowed to construct knowledge rather than being given knowledge through instructions. Constructivism in e-learning is not dissimilar from constructivism in traditional learning. Both provide students with opportunities to actively construct their own knowledge through experience, present in- formation from a variety of perspectives, incorporate the facilitation of an expert or guide, and provide time and opportunities for students to develop metacognitive skills (Mödritscher 2006). With the findings from the study, they concur with other researchers and it was found that students are able to study in groups, which gives them ability to search for answers and improve their skills. Also, constructivism in both traditional and e-learning is not without limitations. It takes a lot of time and effort to create context-based content, and it takes even more time and effort to create content that aligns with individual learners—interests and experiences. Basing on the elements of the theory, the e-learning project has been able to include the elements in everyday learning. Whereby the contribution of the project in helping students learns better, access materials and even the opportunities that keep rising due to the learning project being implemented in the secondary schools. The Quest Forward project has been able to keep the Tanzanian curriculum in digital form and contextualize the resources such as videos, and audios all being made locally. Baker.*et.al.,* (2013) at the end of this study, based on investigators provide the following conclusions. Firstly, study commence by creating an important program into context within the national and international policy investigator ascertains that, facilitators and students are willingly to implement e-learning in secondary school. And finally, an investigator concludes by expose low level of ICT awareness by secondary school teachers which implies that, the government need to add an extraordinary effort to ensure ICT competences observed as an important skill in secondary school similar to other subjects. The findings of this study aligns with the previous author that teachers and students are interested and ready to implement the program and additionally is that the project offers trainings and seminars which reduces the technophobia from teachers and students. (Ngeze, 2017), On his study after findings and critical analysis, an investigator is confidently concluding that, e-learning has proven to be a very effective approach in improving performance of secondary school students. Basing on the findings from this study, the researcher also found it to be significantly true that teachers are learning new methods of teaching and allows students to learn new methods of learning which enhances learning and increases performance in their schools. Siemens describes connectivism as: the integration of principles explored by chaos, network, and complexity and self-organization theories (where) learning is a process that occurs within nebulous environments of shifting core elements- not entirely under the control of the individual. Learning (defined as actionable knowledge) can reside outside of ourselves) is focused on connecting organized information sets and the connections that enables us to learn more and are more important than our current state of knowing" (Siemens 2004).
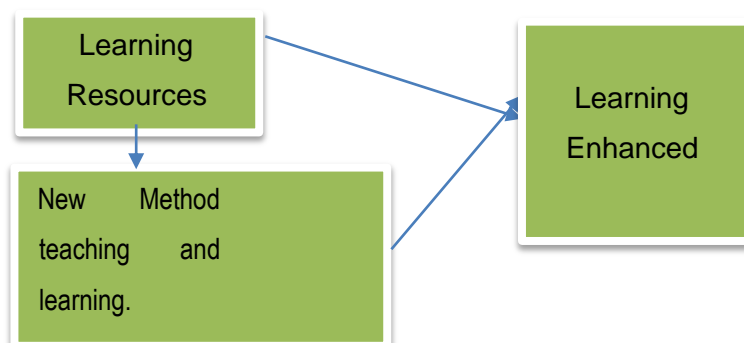
### 3. Methodology

The study was carried out in Kilimanjaro region in Moshi district (Moshi Municipal and Rural). This study used a descriptive research design basing on the nature of the study. Sample size selected under this this study was computed by using a simplified formula proposed by Yamane (1967) for proportions where confidence level is 95% and $P \geq 0.5$ are assumed. Thus, the sample size is calculated using the formula.

$$n = \frac{N}{1 + N(e)^2}$$

Where by:-
n = Sample size.
N = Total Number of population.
e = 0.05 is the level of precision / Margin of error (Yamane, 1967).

Total sample size selected under this study was n = 281 / 1 + 281 $(0.05)^2$. = 165.0513 approximately to be 165. The sampling technique used under this study included purposive sampling which based on the respondent competence and simple random sampling which was used randomly select students and teachers. Among of total selected sample, the following respondents selected as key respondents in this study: Regional Education Officer (REO), Kilimanjaro Region office – education department, Kilimanjaro Region office – ICT department, Heads of secondary school, and the remaining selected respondents was selected through purposive and simple random sampling technique. A structured interview was used to gather information from key informants who in this study were teachers, government employees, and Quest Forward project representatives which had a sample total of 34. Generally, this study employed both interviews and questionnaires as tools for collecting primary data. The analysis and presentation of the first and third objectives have been done using graphs and percentages and the second objective is presented by using linear regression.

### 4. Findings

The respondents of the study were 146, who were selected from schools, Kilimanjaro region office-education department, regional education Officer, Head of schools, teachers and students of the respective schools which are Mtakuja Secondary Schools, Shilela Secondary, Royal Secondary School and Representative from Quest and Forward Project. In this study 145 respondents were included were included in the study, 19 of the respondents were interviewed and 127 respondents were given questionnaires. The profile includes both interviewed and questioned all together.

**Table: 1.1.**          Demographic characteristics of respondents.

| SN | Attribute | | Number of respondents (n=146) | Percentage (%) |
|---|---|---|---|---|
| 1. | **Sex** | Male | 78 | 53 |
| | | Female | 68 | 46 |
| | | **Total** | **146** | **100** |
| 2. | **Age** | under 18 | 121 | 83 |
| | | 19 – 25 | 10 | 6.1 |
| | | 26 –30 | 7 | 4.7 |
| | | 31– above | 8 | 5.3 |
| | | **Total** | **146** | **100** |
| 3. | **Education level** | | | |
| | | Secondary | 125 | 84 |
| | | College | 4 | 06 |
| | | University | 15 | 10 |
| | | **Total** | **146** | **100** |

**Source:** *Field data 2021.*

**Sex**

The data showed that 54% of respondents were male and
46% of them were female. This shows that male responded positively than female respondents. This could be attributed to the fact that most students enrolled in schools are male compared to that number of female students, and this could probably be because the number of male students performing in primary education to be enrolled in secondary schools is higher compared to of female students.

**Age**

The findings show that, respondent's below 18 years of age responded more to the study which determined the validity of the study whereby students lie under the age set. Being students and end users of the platforms and users of ICT tools, the researcher expected them to provide reliable and valid information since they have more experience in e-learning.

**Education**

Therefore, the findings shows that majority of the students had O-level education level which provide remark reliable and valid information on this study since they have been faced with or experience in application of E-learning in Kilimanjaro Secondary Schools.

## 4.2. The Effectiveness of E-Learning Project in The Emergence of New Methods of Learning and Teaching in Moshi Secondary Schools.

The study explored both from students and teachers on the new methods of either teaching or learning that are enhanced by the Quest Forward project. The research findings revealed that on both sides to teachers and students applying e-learning in teaching and learning process but also application of ICT by facilitators in teaching process can help to improve their own teaching practices as well as promote students learning and enhances performance.

**Table 1.2:** Effectiveness of e-learning project in the emergence of new methods of learning and teaching in Moshi Secondary Schools (n=146)

| Responses | Yes | No | Total (%) |
|---|---|---|---|
| i. Learning resources provided by the Quest Forward project enables student to make easy self-review. Strategies provided by Quest Forward project enables | 109 (83.2) | 22 (16.8) | 146 (100) |
| ii. Students interrelate classroom theoretical application with real-life scenarios. | 30 (22.9) | 101(77.1) | 146 (100) |
| iii. ICT – equipment provided by Quest Forward project reflects user-friendly aspects to all learning groups. | 93 (71.0) | 38 (29.0) | 146 (100) |
| i. Ethical consideration and cultural preservation are being followed in all learning resources and strategies provided by Quest Forward project. | 105(80.2) | 26 (19.8) | 146 (100) |
| i. Effective risk policy if there is a violation of ethical Consideration and cultural preservation in teaching Strategies proposed by Quest Forward project. | 111 (84.7) | 20 (15.3) | 146 (100) |

**Source**: Field Data (2021).

83.2% of the respondents agreed that the learning resources provided by the Quest Forward project has enabled students to clearly interrelate in the classroom what is theoretical by applying it in real life situation and being able to make self-review. The program offers learning resources such as videos which links lessons with real life examples and uses. Also with teachers, they are facilitated with seminars on how to understand their learners and help them understand and know where to apply the knowledge they receive. These seminars include therapy sessions, site visits, practical lessons as a teacher would be in class environment. On the other hand, 71% shows that ICT – equipment provided by Quest Forward project reflects user friendly aspect to all learning groups in terms fast learners, average learners and slow learners. Furthermore, 84.7% indicated that, there is effective risk policy if there is violation of ethical consideration and cultural preservation in teaching strategies proposed by Quest Forward project.

The research result furthermore shows that in order to satisfy the needs and accessibility requirements of diverse students, teachers should be familiar with different kinds of existing ICT equipment of which the project offers unique trainings to ensure that any useful ICT or technology know how is given to teachers and students before and during the implementation of the project.

The interviewed teachers across the schools, noted that the project has been able enable teachers with new skills set that has enhanced their teaching but also students have benefited by being introduced to different learning principals such as curiosity, learning better together, learning from set-backs, and others which have trained students to look and think beyond what they learn and so they get to explore. One of the Mtakuja teachers said that; "The students under this project will be rising questions and solving them through approving them with facts, generation of e-learning under Quests Forward learning will be great thinkers and ideal independent and this through the resources and the knowledge getting from quests as well as artefacts making''. In one of the interviews a teacher from Royal Secondary school noted that; "There are a lot of trainings under the Quest Forward project they have change my mindset from using tradition method of teaching to modern one which makes me to be more responsive, and cooperative to student than before also through training I have skills of using Technology as teaching technique".

The research findings further stipulate that effectiveness of e-learning project in the emergence of new methods of learning and teaching in Moshi Secondary Schools include ICT – equipment provided by Quest Forward project, Ethical consideration and cultural preservation and Effective risk policy if there is violation of ethical Consideration and cultural preservation in teaching Strategies proposed by Quest Forward project. Head of schools assured the interviewer that the project highly values cultural preservation and all ethical considerations are adhered to.

### 4.3. Regression Analysis

In table 1.4 the significant values for each independent variable determine its impact on the dependent variable i.e., CBB. The independent variable is represented for example learning resources as X1, Strategies provided by Quest Forward project as X2, ICT – equipment provided by Quest Forward project as X3, ethical consideration and cultural preservation as X4, effective risk policy as X5. The researcher considered only statistically significant variables while developing the regression; equation. The regression equation that is developed is shown as:

$$Y=1.557+0.005X1+0.106X2 +0.04X3+(-0.56)$$

**Table 4.10**

**Coefficients**

| Model | | Unstandardized Coefficients | | Standardized Coefficients |
|---|---|---|---|---|
| | | B | Std. Error | Beta |
| 1 | (Constant) | 1.557* | .196 | |
| | Learning resources provided by Quest Forward project enables students to make easy self-review. | .005* | .055 | .006 |
| | Strategies provided by Quest Forward project enables students to interrelate classroom theoretical application with real-life scenarios | .106* | .048 | .143 |
| | ICT – equipment provided by Quest Forward project reflects user-friendly aspects to all learning groups. | .211* | .043 | .296 |
| | Ethical consideration and cultural preservation are being followed in all learning resources and strategies provided by Quest Forward project. | .004* | .051 | .005 |
| | Effective risk policy if there is a violation of ethical Consideration and cultural preservation in teaching Strategies proposed by Quest Forward project. | -0.56 | .055 | -.069 |

The standardized coefficients of computed scores of learning resources provided Quest Forward project was 0.006 and at a significance level of p = 0.000. This implies that for every one per cent increase in the availability of learning resources provided by the Quest Forward project there was a predicted increase in the percentage of the emergence of new learning methods by 0.006. The standardized coefficients of computed scores of strategies provided by the Quest Forward project were 0.143 at a significance level of p = 0.000. This implies that for every one per cent increase in strategies provided by the Quest Forward project there was a predicted increase in percentage in the emergence of new methods of learning and teaching of 0.143. The standardized coefficients of computed scores of ICT equipment provided by the Quest Forward project were 0.296 at a significance level of p = 0.000. This implies that for every one per cent increase in ICT equipment provided by the Quest Forward project there was a predicted increase in the percentage of the emergence of new learning and teaching methods in schools by 0.296. The standardized coefficients of computed scores of effective risk policy in the violation of ethical consideration and cultural preservation were 0.069 at a significance level of p = 0.000. This implies that for every one per cent increase in violation of ethical and cultural consideration by strategies provided by the Quest Forward project there was a predicted decrease in the percentage of the emergence of new learning and teaching methods in schools by 0.069.

## 5. Discussion

These findings concur with several authors who also believed that these indicators have positive relationship. Khan (2012) viewed e-learning as an innovative approach for delivering a well-designed, learner-centered, interactive, and facilitated learning environment to anyone, anyplace, anytime, by utilizing the attributes and resources of various digital materials. With all these indicators proven to be significant to the study, they have brought to light that e-learning projects do have a major contribution in

accessing resources which may be hard for rural areas of less advantageous schools. For those schools that do not have text books and other learning materials then such projects are ideal to them. The study has also shaded a light on the aspects of learning and teachings methods. Most schools in Tanzania have been using the same methods of teaching (chalk and board) and learning (listening to lectures), but this particular project has managed to change that and so there are new methods of teaching (student-centered) where a teacher is only a coach and guides students and students are the main actors who discover knowledge and become explorers on their own. These tactics have changed both teachers and students' mindsets and brought in new knowledge and discoveries in learning.

The study also, found out that in order for e-learning projects to be sustainable some conditions have to be met which are; provision of learning materials and proper ICT tools such as internet, right content that is contextualized, gadgets, training and resources such as handbooks. The one indicator that stood out was attitude of the teachers, and this has to be met for a project to be successful because it appears that teachers can make e-learning work or fail in a particular school. Teachers have different attitudes and feelings towards technology in general and therefore, a project has to know how to manage different characteristics of the receipt teachers and help them become open minded and accept changes. Also, the study discovered that, although e-learning maybe a good thing and helpful still it is very demanding something that requires commitments and so, if the e-learning has to be sustainable then commitment from every counterpart is highly needed.

However, one indicator that is; effective risk policy had a negative influence on the new methods of learning. That is for every one percent increase in violation of ethical and cultural consideration by strategies provided by Quest Forward project there was predicted decrease in percentage of emergence of new learning and teaching methods in schools by 0.069. These findings are supported by different authors; (Taha Madina 2014), e-learning impacts learners and teachers positively, but without proper control and maintenance of the devices, there is a great risk of misuse which creates divided attention among students.

### 6. Conclusion

The discussion of the study concludes, that learning resources and strategies provided by Quest Forward project enables student to make easy self-review and helps in self-motivated personal studies, and discussions. The learning resources and strategies provided by Quest Forward project enables student to clearly interrelate classroom theoretical application with real life scenarios which is important in today's world which requires solutions to problems that are being faced. Also, the ICT equipment provided by Quest Forward project reflects user friendly aspect to all learning groups (fast learners, average learners and slow learners). The research findings from this study further conclude that the quarterly trainings that teachers receive from the project have taught them new methods of teachings such as learning happens everywhere, learning together, learning from setbacks and curiosity of which all these learning principles have shaped their teaching with new skills to their learners and have been able to use the student-centered learning system. Also, in terms of technology knowhow, teachers gained new knowledge and competence regarding technological usage and even on possibilities in order to encourage learners' choices and decisions about the most appropriate technology.

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