



EFFECTS OF TECHNOLOGICAL RESOURCES IN LEARNING OF ENGLISH IN PUBLIC SENIOR SCHOOLS IN KAKAMEGA COUNTY, KENYA

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Abstract

Technology in education enhances collaboration, peer – learning, self – esteem and critical thinking skills. Despite of overall process of invention and innovation, there has been little empirical evidence on integration of technological resources in learning of English in public senior schools in Kakamega County, Kenya. Specific objective of the study was to: Examine effects of technological resources in learning of English in public senior schools. The study revealed that teachers used technological resources in order for students to investigate, receive feedback, understand, build knowledge and demonstrate retention during learning process. Moreover, teachers had positive attitudes towards adopting technological resources for learning listening skills, speaking skills, reading skills, writing skills and grammar. Nevertheless, they reported limitations in competent use of technological resources and lack of digital resources. Based on the findings, the study recommended that for effective integration of technological resources in learning schools should provide technological resources. Also, they should offer training in digital access, retrieval, storage and use of information for learning practices.

Acronyms: BOM - Board of Management, ETQ – English Teacher's Questionnaire, PQ – Principal's Questionnaire

1.0 Introduction

Technological resources include cellular phones, radio, video, computers and satellite systems. Their usage depends on speed of broadband availability of web-enabled and mobile compatible learning. They complement teacher's efforts in classrooms. This study focused on barriers to utilizing ICT in education in India with a special focus on rural areas (Arnab & Dey, 2018). However, the study of Sampath (2018) evaluated digital divide in India and observed that only 20.7% rural and 69.7% urban students used computer for academic purposes. Therefore, rural learners used computers inadequately during learning sessions.

According to the study of Landon, Hite and Mugimu (2013) categorized ICT products as: administrative (86%), entertainment (45%) and pedagogical (45%). This pointed out that schools used ICT primarily to attract students' enrolment to increase revenue collection. This study focused on ICT in Ugandan Secondary Schools. They used stratified sampling method to identify seven schools; four additional schools were purposively sampled based on high levels of ICT in schools in Mukono, Uganda. Further, the findings of Muvango, Indoshi and Okwara (2019), headteachers indicated that instructional media were insufficiently integrated in teaching and learning of English language. This indicated laxity of school administrators to enforce use of instructional media in English lessons. Their study established use of media in teaching English in secondary schools in Kakamega East Sub-County, Kenya.

Besides, Miima (2014) study observed that ICT resources use in learning of Kiswahili language was inadequate. Yet, ICT policy made it a requirement for institutions to integrate technological resources in order to support and transform learning outcomes. Certainly, when used in schools they increased learning outcomes. The study of Miima (2014) established integration of ICTs in teaching and learning of Kiswahili Language in public secondary schools in Kakamega County, Kenya. It was from this background that the present study examined effects of technological resources in learning of English in public senior schools in Kakamega County, Kenya. The key question this study aimed to answer was: Which effects do technological resources have on learning of English in public senior schools in Kakamega County, Kenya?

2.0 Methodology

The study used Generic Model that was proposed by Wang (2008). It comprised key components: pedagogy, social interaction and technology. The study population was 150 principals and 250 teachers of English. Simple random sampling used to select 108 principals and 152 teachers. Research instruments included: questionnaires for principals and teachers, interview schedule and observation checklist for teachers. The study selected public senior schools by virtue of their uniformity in acquisition, selection and use of technological resources. Principals were chosen as a result of their role of implementing and supervising integration of ICT in senior schools. Finally, based on the nature of the problem under the study; teachers of English were selected as a unit of study due to the fact were point of focus and influential in learning practices, thus they were known to cause positive change easily in the curriculum. Face validity of research instruments was established by judgement of three experts in the Department of Educational Communication, Technology and Curriculum Studies, Maseno University. Reliability of instruments was established through pilot study on 10 principals and 20 teachers of English. The study used test-retest method to estimate degree of reliability of research instruments. The computed coefficients of reliability were 0.85 and 0.85 for questionnaires of principals and teachers respectively. Data was analysed through descriptive statistics included frequencies, means and percentages. Statistical Package for Social Sciences (SPSS) was used to analyse quantitative data.

3.0 Results and Discussions

English Teacher's Questionnaire (ETQ) identified number of technological resources available for learning of English language. Table 1 summed up the results.

Table 1: Availability of Technological Resources

n= 152 Teachers of English

| Technological Resources | Number of Teachers (<i>f</i>) | Percentages (%) |
|---------------------------------------|--------------------------------------|------------------------|
| Smart phones | 89 | 59 |
| ICT/Computer Laboratories | 77 | 51 |
| Radio Educational Programs | 152 | 100 |
| ICT Persons | 60 | 39 |
| Power Point Projectors | 61 | 41 |
| Computers | 152 | 100 |
| E-readers | 40 | 26 |
| Videodiscs | 8 | 5 |
| Films | 8 | 5 |
| Internet connectivity in laboratories | 56 | 37 |
| Interactive whiteboard | 79 | 52 |

Table 1 hinted that Radio Educational Programs and computers were hundred percent available for use in all schools. Nonetheless some software and hardware were not up-to-date for effective

and efficient use in learning process. This slowed down access to, use and storage of e-content. Additionally, it caused files/application to take long to open. Notably, outdated software risks leave computer open to a variety of hacks including ransom ware, malware and data breaches. Software is used to control a computer. They include system software, utility software and application software.

Furthermore, the results in Table 1 showed availability smartphones (59%), whiteboards (52%) and ICT/computers laboratories (51%) which were slightly used above average (50%). Majorly, interview schedule posits that interactive whiteboards improved learning outcomes particularly in writing skills and (Muvango, Kowino, Ajuoga & Okono, 2020) schools with ICT laboratories enabled them to: run sector wide programmes and implement education sector policies. Educational technological resources improved academic standards in schools. Their study examined availability of e-resources for use in teaching and learning of English language in public secondary schools in Kakamega County - Kenya.

However, 60 (39%), 67 (41%), 40 (26%), 8 (5%), 5 (5%) and 56 (37%) teachers of English indicated that availability and use of ICT persons, power point projectors, e-readers, videos discs, films and internet connectivity in laboratories were insufficient respectively. Noticeably, unavailability of technological resources (Muvango *et al.*, 2020) for learning was experienced mainly due to teachers' overreliance on school authorities to provide them.

In addition, 27% interviewed teachers proved that internet connectivity in laboratories allowed: sharing of resources and prompt interaction with learners. Nonetheless, schools had low level of technical assistance with installation and management of networks, hardware and software. Though, this was a meager improvement compared with Muvango, Indoshi and Okwara (2019) study which indicated all teachers of English (100%) did not register presence of language laboratory and computer-mediated materials as available in their schools.

All teachers of English (100%) who were interviewed suggested that incorporation of technological resources in learning practices depended on adequate availability of e-material, regular professional development programs and leadership and support provided by schools. On the other hand, 61% schools needed financial investment in: technological resources, professional training/learning based on ICT, technical support and up-to-date hardware and software. Significantly, teachers' innovativeness (Muvango *et al.*, 2019) should be encouraged in order to ease pressure on schools' administrators on provision of teaching/learning aids in schools. Their research focused on factors influencing the use of media in teaching and learning of English in public secondary schools in Kakamega East Sub – County, Kenya.

Most teachers (95%) indicated that video discs were scantily used in learning practices. Still, the findings noted that they contained authentic documentation to facilitate learning. Video discs and power point projectors were used to teach different writing tasks. Few teachers of English (5%) revealed that video discs were also used to introduce novels/plays whereby learners were assigned to read a text followed by showing film version to the learners. Teachers selected major themes and characters and discussed them through forwarding or playing back during viewing. This method motivated learners to learn and improved learning outcomes tremendously. This was clear evidence that (Muvango, Indoshi & Okwara, 2020) incorporation of technological resources assisted them in realization of lesson objectives wholly. Their research established perceptions of teachers on media use in teaching and learning of English in public secondary schools in Kakamega East Sub-County, Kenya.

The new links such as internet and the World Wide Web (WWW) are dynamic and interactive network that teachers and learners access from all over the world. In consequence, Principal's

Questionnaire (PQ) demonstrated use of the new links in learning of English language. The results were summed up in Table 2.

Table 2: New Links Used in Learning

n= 108 Principals

| New Links | Number of Principals (<i>f</i>) | Percentages (%) |
|-----------------|-----------------------------------|-----------------|
| Internet search | 46 | 43 |
| You Tube | 44 | 41 |
| Whatsapps | 79 | 73 |
| Facebooks | 51 | 47 |
| Twitter | 18 | 17 |
| Wikipedia | 51 | 47 |
| MySpace | 9 | 8 |

In Table 2, 79 (73%) principals proposed that whatsapp was adequately used in learning process. They cited its ease of use and efficiency in learning. It also improved learner's reading skills, writing skills, grammar and vocabulary nevertheless internet was measly accessible.

Furthermore, 46 (43%), 44 (41%), 51 (47%), 18 (17%), 51 (47%) and 9 (8%) of principals demonstrated a paltry use of internet search, You Tube, Facebook, Twitter, Wikipedia and MySpace in the curriculum. All the same, internet search (43%) indicated a steady improvement in its usage in comparison with Muvango *et al.*, (2020) results whereby internet search had 18.5% only. Their study examined availability of e-resources for use in teaching and learning of English language in public secondary schools in Kakamega County, Kenya.

According to teachers who were interviewed (59%) asserted that teaching with technology helped to build the four macro skills of language (listening skills, speaking skills, reading skills and writing skills) and the ability to apply them in the curriculum. More so, 41% principals exposed that: e-materials were posted on the web and assignments were communicated through the network. Although, they claimed that inadequate and unstable internet connectivity hampered use of the new links.

The interview schedule revealed that You Tube allowed teachers share educational video clips through cell phones and e-mails. The internet and WWW facilitated the opportunity for learner – centred teaching, self – learning and peer teaching activities. It also provided chance for teacher – to – teacher, learner – to – learner communication, collaboration and peer training in schools. Though, schools also were allocated insufficient budget that could not cater for internet costs, infrastructure and maintenance.

Face books, Twitter, MySpace and Whatsapp are social networking communities. Consequently, 63% interviewed teachers suggested that social media/social networking communities enhanced: interaction amongst teachers, connection and collaboration with other teachers. They also revealed that teachers created, shared and exchanged information and ideas in a virtual community and network (67%). Then, 58% principals confirmed that social media promoted learner participation on an interactive discussions, supported learners in forming social connections with others and collaboration to share ideas and receive timely feedback.

Interview Schedule revealed that teachers had positive attitudes to adopting word processor that enhanced acquisition of language skills amongst learners. It improves writing process because of its superior editing tools such as thesaurus, autocorrect spelling and grammar checkers. Thereupon, it provides students with opportunities to connect listening skills, reading skills, writing skills and grammar use.

ETQ determined use of internet resources in teaching of English language. Table 3 indicated the results.

Table 3: Internet Resources Use in Teaching

n=152 Teachers of English

| Internet Resources | Responses (f) | Percentages (f) |
|---|----------------------|------------------------|
| Computer games | 33 | 22 |
| Internet assignments | 66 | 43 |
| Software drills | 25 | 16 |
| Search engines such as google, chrome, Artificial Intelligence (AI) | 71 | 47 |

In Table 3, 33 (22%), 66 (43%), 25 (16%) and 71 (47%) teachers insufficiently used computer games, internet assignments, software drills and search engines respectively. Notwithstanding, the study called upon principals, teachers, parents and learners to intensify use of internet resources because they contained quality information that enhanced learning outcomes.

More so, 61% teachers interviewed indicated that schools' technological investment impacted positively on learning outcomes especially when internet technologies are utilized effectively and efficiently in learning process. The study noted that schools with high levels of technological resources (especially national and extra county schools) demonstrated rapid increase in academic performance than those with low levels.

Majority of teachers (63%) pointed out that they lacked motivation, competence and training regarding use of internet resources in learning practices. This limited access and use of internet technologies in schools. Still, this study showed an improvement on use of computer games (22%) and internet assignments (43%) in contrast with Muvango *et al.*, (2020) study whereby computer games (6.5%) and internet assignments (17.6%) were very inadequately used in the curriculum.

ETQ indicated e-mails, websites, e-libraries and e-material usage in learning of English language. Table 4 summed up the results.

Table 4: Internet Technologies usage

n=152 Teachers of English

| Internet Technologies used | Number of Teachers (f) | Percentages (%) |
|-----------------------------------|-------------------------------|------------------------|
| E-mails | 65 | 43 |
| Websites | 50 | 33 |
| E-libraries | 50 | 33 |
| E-materials | 56 | 37 |

In Table 4, 65 (43%), 50 (33%), 50 (33%) and 56 (37%) teachers showed that e-mails, websites, e-libraries and e-materials were inadequately used in learning of English language respectively. The Observation Checklist showed that only 26 (17%) public senior schools had a total of 21 different e-libraries downloaded in their computers. The main e-libraries in schools included Mindset, Wikipedia, Encarta and Health matters which teachers and learners used for information search.

The study also identified that school ICT programmes were funded by donors, Board of Management (BOM) and Parents Association (PA). Importantly, from Table 1, 100% of schools' PA/BOM afforded to invest in computers but were unable to invest in e-libraries. Few e-materials in the schools libraries were sourced/bought by BOM/PA.

Accordingly, 64% teachers interviewed suggested that internet technologies were expensive thus unsatisfactorily used in the curriculum. 65% teachers of English lacked awareness of internet technologies available in schools thus this caused low usage in learning practices. Also, 51%

schools had low e-confident teachers yet majority of schools offered peer training to other teachers on technological integration in learning practices. Greatly, incorporation of technologies required personal initiative (knowledge, skills and attitudes) amongst teachers/learners/librarians for successful implementation. Observation Checklist (OC) demonstrated access points of ICT facilities in the curriculum: 108 public senior schools included two National Senior Schools (N), 22 Extra-County Senior Schools (E), 28 County Senior Schools (C) and 56 Sub – County Senior Schools (S) were observed. Table 5 revealed the results.

Table 5: Access Points of ICT Equipment

n= 108 Teachers of English/Schools

| Access points of ICT Facilities | Total Number of senior schools | Number of Access Points Available (<i>f</i>) |
|---------------------------------|--------------------------------|--|
| Computer Laboratories | 2 N | 4 |
| | 22 E | 11 |
| | 28 C | 9 |
| | 56 S | 3 |
| Schools' ICT Centres | 2 N | 3 |
| | 22 E | 8 |
| | 28 C | 5 |
| | 56 S | 0 |

In Table 5, two national senior schools selected had adequate access points of ICT facilities: four computer laboratories and three ICT centres. All the same, Extra-County Senior Schools (E), County Senior Schools (C) and Sub – County Senior Schools (S) had inadequate access points of ICT facilities. Out of 27 (25%) computer laboratories observed majority 15 (13.9%) lacked internet connectivity thus hinder accessibility of e-materials for learning.

Only 12 (11%), 8 (7.4%) and 7(6.5%) teachers pointed out that internet connection was through Zuku, Safaricom Home and Airtel Internet Service Providers respectively. Respondents identified other internet service providers such as Telkom (2%, Poa internet (1%), Elink Networks (2%) and Skynet broadband (2%). Nonetheless, some schools implied payment for the service was not done promptly. Regardless, 5 (10%) teachers suggested that the programme sponsored by Intel had equipped schools to use wireless connectivity for learning process.

Further, the interview schedule established that radio, mobile phones, video, film and OHP were used for learning listening skills and speaking skills whereas e-reader, computer, laptop and OHP were used to learn writing skills, reading skills and grammar. More so, e-readers and e-newspapers were used to learn reading skills, listening skills and grammar. Thus, (Muvango, 2021) integration of language skills and technological resources improve students' knowledge, skills and attitudes amongst students.

PQ revealed ICT capacity building courses teachers attended in their schools. Results were summed up in Table 6.

Table 6: In-Service Training

n= 108 Principals

| In-Service Training Attended | Number of schools (<i>f</i>) | % |
|--------------------------------------|--------------------------------|----|
| School – based professional Training | 67 | 62 |
| Seminars | 52 | 48 |
| Workshops | 36 | 33 |
| Webinars | 40 | 37 |

In Table 6, 67 (62%), 52 (48%), 36 (33%) and 40 (37%) principals proved that their teachers attended school - based professional training, seminars, workshops and webinars respectively. School – based professional training was preferred and it ranged from training on the operation of ICT facilities and applications to ongoing collaborative school development/peer – teaching/learning. Trained ICT mentors (ICT Champions) in each school provided ICT support and leadership. It aimed on improving in – class practices of incorporating technological resources in instruction. It also resulted in new or improved professional practices in the curriculum. This action based learning activities made teachers focused on actual practices.

The Table 6 results presented a slight improvement on teachers’ workshop attendance in comparison with Muvango, Indoshi and Okwara (2019) study which recorded only 30%. Even so, the results showed seminars (48%), workshops (33%) and webinars (37%) were insufficiently attended by teachers because of below average (50%) attendance. The technological in-service programs were meant to improve learning outcomes throughout the schools’ systems. Their study identified use of media in teaching English in secondary schools in Kakamega East Sub-County, Kenya.

Significantly, 39% interviewed teachers expressed that technological - based in-service training improved individual teacher’s career progression in dimensions such as application of teacher’s learning and competences. Notwithstanding, interview schedule noted that 43% teachers lacked opportunities for them to apply their learning soon after workshop, seminars and webinars in order to reduce loss of knowledge and skills gained during in-service sessions. The aforementioned results were in tandem with Ivan (2007) research. He used a social constructivist approach to investigate factors that shaped the successful and sustained use of ICT in classroom teaching and learning practices. The findings were elaborated using activity approach.

Noticeably, workshops, seminars and webinars introduced new technologies and activities or innovation in the curriculum. Likewise, Microsoft Partners offered a range of professional development programs to bridge the gap between technology skills and innovative learning. The partners in learning provided teachers the knowledge so that to impart 21st Century skills to their students and deliver exceptional student outcomes.

4.0 Conclusions and Recommendations

4.1. Conclusions

The study revealed that teachers used technological resources in order for students to investigate, receive feedback, understand, build knowledge and demonstrate retention during learning process. As well, teachers had positive attitudes towards adopting technological resources for reading, writing and grammar. But, they reported limitations in competent use of technological resources and lack of technological resources for access, retrieval, storage and use of information for learning practices.

4.2 Recommendations

The study recommended that for effective integration of technological resources in learning should provide technological resources and offer training in access, retrieval, storage and use of information for learning practices. Also, Ministry of Education (MoE) in conjunction with Sub-county Quality Assurance and Standard Officers (SQASOs) should also ensure that monitoring and evaluation is done to help in development and delivery of technological resources in public senior schools.

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