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Abstract

The relationship between learning and technology integration hold the promise of revolutionizing education because the core purpose is to facilitate knowledge management by providing a structured environment that equips learners with the skills to promote learning, especially as the world grows increasingly digitalized. The objectives of the study were: to investigate the integration of ICT in teaching and learning methods, to analyse the integration of ICT in teaching and learning materials and to examine the integration of ICT in the assessment of early learning.

The study was guided by Technological Pedagogical Content Knowledge Framework (TPACK). The study population included Early Childhood Development (ECD) teachers, education officers in charge of ECD in the county and public primary school head teachers. Simple random sampling was used to obtain 177 ECD teachers that is 10% of 1,768 ECD teachers from 884 public primary schools in Bungoma County. The study adopted a descriptive research design. Questionnaire and interview schedules were the main primary data tools for data collection. The findings showed that teacher's underutilization of ICT in the classroom and their resistance to embedding ICT across the curriculum can be detrimental to attempts to introduce new teaching and learning technologies in education. Therefore, it is crucial to monitor teacher's ICT utilization and examine factors that contribute to their sceptical practices of teaching with technology. The results indicated that ICT devices can be used for improving the assessment outcomes and thus improve the efficiency and effectiveness of learning. The study also found out that several challenges have impeded the integration of ICT into early and this includes power supply, inadequate ICT training and an insufficient number of ICT devices in schools for successful integration. The study recommends that the government improves the numbers of ICT devices in school to improve on the ratio of the ICT devices per pupil, facilitate ICT training for teachers.

1.0 Introduction

ICT is a collective term used to refer to the electronic devices and communication infrastructure that allows them to communicate with each other either autonomously or as tools in the hands of individuals. The term replaced the formerly common moniker IT that remains synonymous to the description of feature-rich gadgets (especially computers and computer devices) and the internet. This shift came about as a result of the expansion of the concepts of information and communication prompted by the diversity in their definitions based on the field in which they are applied and the purposes for which they are intended. As such, the world has come to view information as a tool much as it views ICTs with the product being knowledge because of its contextual nature that makes it valuable (Siraj-
Blatchford & Siraj-Blatchford, 2003). Learning is the process through which individuals and groups combine the information and tools available to them to develop actionable and meaningful insights that make their work and lives easier and solve challenges and problems they face.

The increased capacity technology brings to the understanding and management of the various elements of a system also works to improve learning outcomes significantly (Kang, Heo & Kim, 2011). It does this by giving learners the aptitude to take active command of their own learning development and develop evaluation strategies that help them to bridge gaps in knowledge that keep them from achieving higher outcomes (Dunn et al., 2011). In addition, it provides them with the tools to communicate with their peers, network with subject matter experts and access diverse knowledge repositories to grow their understanding of the concepts they want to study. Also, because technology also increases the ease of editing and adding to the body of knowledge, it also allows learners to contribute to making information easier to consume and understand by using the numerous suites of tools available to create more effective delivery modes like videos (Voogt and Roblin, 2010).

Aligning education goals with the country’s long-term goals improves learning outcomes tremendously by creating a closed-loop system between learning institutions and industries and the job market. Increasing the interrelationship between these two principle elements of economic development and growth further improves the country’s capacity to ensure that they remain competitive globally. It does this by increasing their capacity to track the evolution of challenges and problems facing different regions, therefore, giving them the foresight to nurture the skills and talents needed to solve them. In addition, it generates significant volumes of information actively that helps to inform the development of policies and frameworks that are flexible enough to evolve with the changing circumstances and contexts of the global environment (Pelgrum, 2001). The use of computers and ICTs in the classroom has undergone a lot of transformation over the years as different institutions and countries have worked to develop adoption strategies that offer them higher returns. Their use started out as standalone courses with dedicated labs to teach students the different features of computing devices and how to exploit them to increase their capacity to manage knowledge, but has since evolved to the use of ICTs as auxiliary tools in the learning process. As such, there also exists a vivid trend in the evolution of policies and framework guiding the development and management of curricula, with countries and institutions in the same regions exhibiting a convergence in their development patterns. Sound procedures set the tone that allows institutions to get the most out of the integration of ICTs by taking advantage of its processing and communication features to enhance the performance of all stakeholders (Pelgrum and Voogt, 2005). Also, they increase the levels of accountability in the system by increasing the ease of analyzing the large volumes of performance data sets that the different elements and processes of the systems generate (Peacock and Jesson).

However, since technology is very dynamic and new devices and platforms are created every other day, focusing on understanding what combinations, especially of soft of software, bring the most advantages to digital learning strategies is fast becoming the most important aspect of ICT integration (Clements, 2002). Currently, and probably going forward, as technology brings about the convergence of the processing capabilities of most devices, the choice of software is fast becoming the only variable that policymakers can leverage to increase the success of their strategies. In addition, studies have shown that the ease of use of software plays a large role in influencing the perceptions and attitudes of its users and, therefore, further increasing their importance in the conceptualization of technology integration in education.

1.2 Statement of the Problem
Integration of educational technology into classroom instruction to enhance learner learning is of increasing interest to stakeholders such as policymakers, administrators, educators, learners, and parents (Keengwe, 2007). Therefore, technology is not really a culprit if we use it wisely and it also should solve the problems and fill the gap in the education system as expected. Since literature has shown that integrating technology into curricula with the intent of positively influencing teaching and learning has been in a state of evolution, the main purpose of the study was to establish the influence of the integration of Information Communication Technology onto teaching and learning in early learning in Bungoma County, Kenya.
1.3 Objectives of the Study
This study was guided by the following objectives:

i. To investigate the integration of Information Communication Technology in teaching and learning methods.

ii. To analyse the integration of Information Communication Technology in teaching and learning materials.

iii. To examine the integration of Information Communication Technology in the assessment of early learning.

2.1 Integration of ICT in Teaching and Learning Methods
Teachers must make informed choices of the tools they will use in their lessons depending on the outcomes they desire to increase, and their evaluation of their students’ abilities (Lapadat, 2015). In most cases, the tools they choose will not necessarily be the most efficient in carrying out the intended tasks, but should be the ones that allow them to increase students’ engagement and understanding of the procedures involved the most. Understanding the right way to carry out tasks promotes learners’ capacity to grasp and remember procedures, and carry them out successfully.

It is important that teachers understand that ICTs are not a curriculum on their own but just a delivery mechanism that allows them to engage with their learners on a deeper level, and also provide both groups with the tools to increase their ability to solve problems and develop insights (Kuiper, 2014). As such, it is important that institutions develop vocational programs to encourage teachers’ skills development alongside their ICT training otherwise they might substitute the latter for the former and reduce students’ learning outcomes and competence significantly.

There are four main categories of computer systems that learners and teachers use in their learning processes, and they include informational resources, location systems, constructive tools, and contact systems (Tay & Lim, 2003). Informational resources are systems that archive and present a variety of information in all types and formats, and mostly constitute digital repositories. Location systems are platforms that provide immersive content that lets users interact with items in another world, and include games and most recently augmented reality platforms. Constructive tools are the resources that increase users’ ability to manipulate data and generate meaningful information that helps them to achieve their goals faster and more efficiently. They mostly include analytics and graphics tools. Contact systems are applications that allow users to communicate among themselves or seek out each other either for social or professional purposes.

Understanding how to use these different tools effectively increases users’ ability to develop new insights from ordinary data, and increases the contributions they make to the growth of the body of knowledge (Tay & Lim, 2003). They do this by providing users with the means to present the results of the higher-level thinking they achieve from developing effective learning habits and consuming and assimilating a lot of data. Teachers are instrumental resources in learners achieving this level of mental operation because of the experience and knowledge they have on developing healthy learning habits and their capacity to evaluate learners’ progress effectively.

According to Hogle (2012) the choice of tool should depend on the need and overall goals learners want to achieve. However, he noted that interactive applications, such as games, recorded higher rates of engagement among learners and increased learning outcomes especially as concerns organization and memory. The immersive environment they create increases learners’ capacity to relate with the elements and concepts that make up the learning exercise, and increased their cognitive abilities in the process. Nevertheless, these gains are highly dependent on the reasons these interactive applications are developed and the overall learning goals for which they are employed. Otherwise, their effectiveness is not guaranteed and their use might actually be counterproductive and affect learners negatively, resulting in the reduction of their learning outcomes. The emerging pattern seems to support the idea that the tools that increase users’ ease to manipulate and present information work to enhance their overall cognitive abilities and bring them into higher-level thinking, and those that increase their ease of communication promote the development of more artistic abilities and skills, such as communication and debate (Lapadat, 2015).

Whitebread and Hayes (2013) established that the use of ICTs in the classroom could be broadly categorized into uses aimed at improving cognitive tasks and those aimed at increasing communication. They also argued that since these two features of learning worked in tandem with each other, it was important that learners worked on developing both competencies simultaneously if they wanted to increase their overall performance.
significantly. Their results indicated that there was high convergence between these two and that they both contributed to the effectiveness of the other in that they increased a learner's capacity to develop great insights, and gave them the ability to communicate these insights effectively such as to create or inspire change in how others operate or think. For example, given a large data file, a skilled learner will use his knowledge of relationships to generate contextual information on different aspects of the population he or she is studying, then use his or her skills in communication to present this information in a format that increases his or her audiences' capacity to assimilate and understand.

2.2 Integration of ICT and Teaching and Learning Materials

One of the most critical factors contributing to the efficient and productive implementation of IT in all subjects and for all learners is exposure to an appropriate and sufficient ICT network. Once again, certain fundamental concerns remain, preventing the application of emerging technology in education and research (Clements, 2002). The availability of ICT in schools is a crucial precondition for the effective introduction of new educational approaches and strategies. Using digital resources and content online can boost learning experiences and empower learners. According to Eurydice 2011, European education systems and policy studies do not have an unusual gap in the accessibility of ICT supplies between schools, but the lack of educational software and the lack of teacher support still have an impact on the level of ICT usage in schools.

ICT technology cannot just enhance learning practices and include new approaches, but can also be used to strengthen the administration of schools and their tasks. This can be noted that the introduction of ICT into schools has strengthened classroom operations and practices. Among the educational practices in which the proportion of computers and IT will increase and benefit from the computerization of school libraries and school administration, it is possible to differentiate the use of ICT for extracurricular activities and better communication between teacher and parent, as well as enhanced engagement between teacher and learner (Clements, 2002).

When it comes to the use of computers, different decisions are taken about how to handle ICT equipment in classrooms. It is advised that ICT equipment be installed in a number of school locations according to education plans from most European countries. Workstation laboratories require ICT to be used as a financially understandable part of the teaching system. But this can lead to the use of ICT to learn more about ICT than about ICT (Clements, 2002). Easily accessible workstations, either in a number of places or in the classroom, can be used more frequently in the course of the day and for various uses and learning experiences. ICT accessible in classrooms can be appealing, in particular for guidance setting and task analysis. Widespread availability of ICT in schools can broaden individual preferences and can help adapt to the specific needs of particular learners by incorporating individualized learning programs and strategies that are important to the learners' level of experience. However, the free use of ICT by students is not so widespread, based on the study of Eurydice 2011. In most cases, particularly when computers are placed in computer labs or classrooms, it is shown that ICT use is often performed under teacher supervision and during specific hours.

Effective pedagogy and the sound learning goals should guide the materials choice and tools, including the technology, to be used in activities of learning (Bredekamp & Rosegrant, 1994; Davis & Shade 1990). “Whatever materials or devices are suited best for the role should be used; sometimes, the right tool for the job is computers while sometimes they are not; the trick is to know the difference” (Davis & Shade, 1999). Computers are effective tools which, like all technology, are most useful when used as a regular part of the learning process.

Studies indicate that child development benefits from the use of correct technologies when computers are installed in the classroom are substantially greater than in computer laboratories (Davis & Shade, 1999). Reasons cited include: limited access to computers when placed in laboratories, a tendency to use drilling and practicing technology in laboratories, albeit a more tool-oriented approach.

2.3 Integration of ICT in Assessment of Early Learning

The Assessment and Teaching of 21st Century Skills (ATC21S, 2013) distinguishes the likelihood of teaming up with others and the capability to connect through the use of technology as an essential skill of the 21st century. ATC21S, 2003
defines and categorizes the skills of the 21st century into four broad categories:

- Ways of thinking-including innovation, logical thinking, problem-solving, decision-making and understanding.
- Ways of work—Communication and collaboration as one of the most important assets.
- Working tools—Information and Communication Technologies (ICT) and Information Literacy.
- Life skills in the world—Citizenship, life and career, personal and social obligations.

Using the two skills which connect all the four categories, namely collaborative problem-solving and ICT literacy, these categories can be represented. These skills should be accepted by teaching activities and encouraging learners to develop their competencies.

Recent Ezza EY studies show that a teacher is tasked with various roles which were not viewed as important before ICT was implemented into education. It is very clear that the ICT-based world does not focus solely on the dispersal of knowledge compared to the traditional roles of educators.

A common focus, when integrating technology as a tool, is to increase learner achievement. Teachers and Policymakers are renewing their commitment to programs and training practices that enhance the impact on learning outcomes and instruction. Due to the widespread use of technology in the world in which we live, the use of technology in teaching and learning is crucial if we want to have a positive impact on pupils' learning. Today, with the introduction of the Common Core Standards and their focus on technology, the use of technology in schools will become an even higher priority (Cristen, 2009).

Computers and programs of writing can be used also to explore written language with preschool-age children, and their use can be effectively incorporated into process-oriented writing software as early as the first grade or kindergarten classes (Clements & Nastasi, 2013). Such software provides the young writers with the critical support, or framework. Enabling them in performing activities they would not be capable in performing on their own. It enhances positive attitude in writing and word processing among children from kindergarten through primary grades, encouraging children to write longer and more nuanced stories and to think less about errors. In addition it encourages learners to communicate more efficiently, more fluently and more efficiently. Helps children to gain confidence in writing and inspire them to write more when using computers than when using paper and pencil.

For young children computers are fundamentally convincing. Sounds and graphics are getting the attention of children. Various types of applications have been developed, such as I MyTalk, Look2learn, and Easy Lexia, to support communication, understanding, recognition and literacy skills for children. The research on dyslexia patients conducted by the Department of Software and Systems Design Technology, Aegean University, Greece (Skiada, Soroniati, Gardeli & Zissis, 2014) shows that children with dyslexia concentrate and keep them focused by concentrating their attention on the touch screen monitor.

Technology is an important learning tool if used to deepen the learners' dedication to a substantive and scientifically credible curriculum. Technology is an instrument to this end. When it's the right learning method for learners it should be picked. Technology can be an especially useful tool for English learners and can increase the involvement of disabled children. In elementary school children can begin by using common technology resources as.

3.1 Research Methodology

This paper used a descriptive research design as it allowed the researchers to analyze in detail a single person / case to gain insight into early years learning and teaching. Comprehension of the philosophical paradigm underlying the analysis is very critical and this study adopts a pragmatic framework. The study was conducted in Bungoma County and it adopted Technological Pedagogical Content Knowledge Framework (TPACK) by Punya Mishra and Matthew J. Koehler’s. The study population included Early Childhood Development (ECD) teachers, education officers in charge of ECD in the county and public primary school headteachers. Simple random sampling was used to obtain 177 ECD teachers which is 10% of 1,768 ECD teachers from 884 public primary schools in Bungoma County. The study adopted a descriptive research design. Self-regulated questionnaires and semi-structured interviews were the main tools of data collection. Using triangulation, the researcher was able to capture a more thorough, holistic and contextual representation and reveal the different dimensions of the phenomena under study.
4.1 Findings and Discussion
This section presents the findings of the study based on the data obtained from the respondents. The purpose of this mixed method study was to find out teachers' competency in the integration of Information Communication Technology onto teaching and learning in early learning in Bungoma County, Kenya. Data collection was done using triangulation of two tools; questionnaires for ECD teachers and interview schedule for headteachers and ECD education officers. The study managed to capture data from 104 ECD teachers representing about 90% of the sample size.

Table 4.1: Integration of ICT in Teaching Methods

<table>
<thead>
<tr>
<th>Variable</th>
<th>NA %</th>
<th>LE %</th>
<th>N %</th>
<th>L %</th>
<th>VLE %</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Integration of ICT influences selection of teaching method to be used in the classroom</td>
<td>1.9</td>
<td>11.5</td>
<td>10.6</td>
<td>60.6</td>
<td>15.4</td>
<td>3.759</td>
<td>0.919</td>
</tr>
<tr>
<td>Integrating ICT in learning leads to innovative methods of teaching</td>
<td>1.9</td>
<td>1.0</td>
<td>8.7</td>
<td>53.8</td>
<td>34.6</td>
<td>4.183</td>
<td>0.785</td>
</tr>
<tr>
<td>Learner centered methods are used when using technological devices</td>
<td>3.8</td>
<td>10.6</td>
<td>19.2</td>
<td>49.0</td>
<td>17.3</td>
<td>3.654</td>
<td>1.012</td>
</tr>
<tr>
<td>Use of technological makes it easy to utilize variety of teaching methods</td>
<td>25.0</td>
<td>21.2</td>
<td>10.6</td>
<td>34.6</td>
<td>8.7</td>
<td>2.808</td>
<td>1.373</td>
</tr>
<tr>
<td>Technological tools highly motivate young children</td>
<td>2.9</td>
<td>3.8</td>
<td>1.9</td>
<td>50.0</td>
<td>41.3</td>
<td>4.231</td>
<td>0.895</td>
</tr>
<tr>
<td>Teaching methods that adopt ICT promote a friendly co-operative environment in the classroom</td>
<td>2.9</td>
<td>14.4</td>
<td>17.3</td>
<td>49.0</td>
<td>16.3</td>
<td>3.615</td>
<td>1.017</td>
</tr>
<tr>
<td>Technological tools distract young children’s attention</td>
<td>1.9</td>
<td>22.1</td>
<td>13.5</td>
<td>50.0</td>
<td>12.5</td>
<td>3.490</td>
<td>1.033</td>
</tr>
<tr>
<td>Technological tools are suitable for instructional methods used in early childhood education</td>
<td>1.9</td>
<td>21.2</td>
<td>7.7</td>
<td>29.8</td>
<td>39.4</td>
<td>3.890</td>
<td>0.913</td>
</tr>
<tr>
<td>Technological tools are essential for teaching and learning</td>
<td>1.0</td>
<td>18.3</td>
<td>16.3</td>
<td>42.3</td>
<td>22.1</td>
<td>3.664</td>
<td>1.048</td>
</tr>
</tbody>
</table>

Source: Research Data (2019)

Table 4.1 sought to establish the integration of ICT as a platform for instructing early learners. The data show that the respondent instructors affirmed Integration of ICT influence selection of teaching method to be used in the classroom. (Mean = 3.759, SD = 0.919). Furthermore, the respondent instructors perceived that Integrating ICT in learning leads to innovative methods of teaching (Mean = 4.183, SD = 0.785). Learner centered methods are used when using technological devices (Mean = 3.634, SD = 1.012). However, according to the respondent instructors, the use of technological tools does not increase the quality of early childhood education (Mean = 2.808, SD = 1.373) but it is seen to motivate the young learners (Mean = 4.231, SD = 0.895).

4.2 Integration of ICT in Instructional Methods
The study sought to identify characteristics of integrating information communication technology into methods of teaching and learning in early years. The study used a 5 – point Likert type scale of Likert-type scale with a scale: 1 - Not at all (N); 2 – Lesser Extent (LE); 3 - Neutral (N); 4 – Larger Extent (L); and 5 – Very Large Extent (VLE). The results were reported in frequencies and percentages and aided in interpreting descriptive results of the study.

As indicated by the respondent instructors, the technological tools promote a friendly co-operative environment in the classroom (Mean = 3.890, SD = 0.913), however, in some instances, they distract the learners’ attention (Mean = 3.490, SD = 1.033). Lastly, the respondent instructions asserted it is essential to integrate ICT into learning and teaching (Mean = 3.664, SD = 1.064).

The findings indicate that ECD teachers in Bungoma County perceive that integration of ICT influences selection of teaching method to be used in the classroom. Furthermore, the teachers perceived that Integrating ICT in learning leads to
innovative methods of teaching and learner centered methods. However, according to the teachers, the use of technological tools does not increase the quality of early childhood education but it is seen to motivate the young learners. This emphasised as indicated that technological devices promote a friendly co-operative environment in the classroom although the teachers seemed to agree that in some instances, they distract the learners’ attention. Lastly, the ECD teachers asserted that it is essential to integrate ICT into teaching methods used in ECD in Bungoma County.

### Table 4.2: Application of ICT in T/L materials

<table>
<thead>
<tr>
<th>Variable</th>
<th>NA</th>
<th>LE</th>
<th>N</th>
<th>L</th>
<th>VLE</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Schools use diverse set of ICT tools to communicate, create, disseminate, store, and manage information</td>
<td>3.8</td>
<td>11.5</td>
<td>13.5</td>
<td>50.0</td>
<td>21.2</td>
<td>3.904</td>
<td>1.048</td>
</tr>
<tr>
<td>Teachers have access to ICT devises in schools</td>
<td>1.9</td>
<td>4.8</td>
<td>12.5</td>
<td>52.9</td>
<td>27.9</td>
<td>4.067</td>
<td>0.987</td>
</tr>
<tr>
<td>Teachers have the knowledge and confidence of using the ICT devises in schools</td>
<td>2.9</td>
<td>5.8</td>
<td>10.6</td>
<td>52.9</td>
<td>27.9</td>
<td>4.000</td>
<td>0.881</td>
</tr>
<tr>
<td>Teachers utilize ICT devices in and out of class activities</td>
<td>3.8</td>
<td>9.6</td>
<td>11.5</td>
<td>56.7</td>
<td>18.3</td>
<td>3.971</td>
<td>0.939</td>
</tr>
<tr>
<td>The technological tool requires visual and manipulative skills to effectively illustrate concepts</td>
<td>4.8</td>
<td>10.6</td>
<td>5.8</td>
<td>50.0</td>
<td>28.8</td>
<td>3.759</td>
<td>0.990</td>
</tr>
<tr>
<td>Using Technological tools take a lot of time hence making instruction cumbersome</td>
<td>3.8</td>
<td>12.5</td>
<td>10.6</td>
<td>44.2</td>
<td>28.8</td>
<td>3.875</td>
<td>1.094</td>
</tr>
<tr>
<td>Technological tools improve the delivery of content during class time</td>
<td>5.8</td>
<td>5.8</td>
<td>7.7</td>
<td>53.8</td>
<td>26.9</td>
<td>3.817</td>
<td>1.103</td>
</tr>
</tbody>
</table>

Source: Research Data (2019)

Table 4.2 sought to establish the integration of ICT T/L materials in early learning by ECD teachers in Bungoma County. The findings show that Schools use diverse set of ICT tools to communicate, create, disseminate, store, and manage information (Mean = 3.904, SD = 1.048). Further, the respondent instructors said that teachers have access to ICT devises in schools (Mean = 4.000, SD = 0.881), which indicates that most teachers don't have access to utilize ICT devices in schools. In addition, the findings show that teachers don't have the knowledge and confidence of using the ICT devises in schools (Mean = 3.971, SD = 0.939). Teachers also agreed that technological tool requires visual and manipulative skills to effectively illustrate concepts. The technological tools also improve learning in that visual aids are effective in illustrating learning concepts (Mean = 3.759, SD = 0.990). Through the application of the ICT platform, the instructors felt that using technological tools take a lot of time hence making instruction cumbersome (Mean = 3.875, SD = 1.094). According to the instructors, the technological tools are also helpful in improving the delivery of content during class time (Mean = 3.817, SD = 1.103).

Figure 4.1 indicate teachers responses on the form of ICT devices used. Majority of the respondent 38% use Smartphone in instruction followed by 26% using computers. Other devices such as interactive whiteboard, tablets, video cameras and data projectors are not utilized at all.

### 4.3 Integration of ICT in Teaching and Learning Materials

The study sought to identify characteristics of integrating information communication technology resources in instructional medium. The study used a 5 – point Likert type scale of Likert-type scale with a scale:1 - Not at all (N); 2 – Lesser Extent (LE); 3 - Neutral (N); 4 – Larger Extent (L); and 5 – Very Large Extent (VLE). The results were reported in frequencies and percentages and aided in interpreting descriptive results of the study.
4.4 Integration of ICT in Assessment of Early Learning

The study sought to identify how integrating information communication and technological resources can aid in the assessment of learning in early years. The study adopted these features based on the notion that it would help in improving learning assessment in the primary schools. The study used a 5-point Likert type scale of Likert-type scale with a scale: 1 - Not at all (N); 2 - Lesser Extent (LE); 3 - Neutral (N); 4 - Larger Extent (L); and 5 – Very Large Extent (VLE). The results were reported in frequencies and percentages and aided in interpreting descriptive results of the study.

Table 4.3: Integration of ICT in Assessment of Learning in ECDE

<table>
<thead>
<tr>
<th></th>
<th>NA</th>
<th>LE</th>
<th>N</th>
<th>L</th>
<th>SA</th>
<th>Mean</th>
<th>SD</th>
</tr>
</thead>
<tbody>
<tr>
<td>Using ICT in actual instruction has a positive influence on children performance</td>
<td>2.9</td>
<td>3.8</td>
<td>1.9</td>
<td>50.0</td>
<td>41.3</td>
<td>4.231</td>
<td>0.895</td>
</tr>
<tr>
<td>Teachers use ICT to store learners’ assessment records through applications such as word and excel</td>
<td>2.9</td>
<td>14.4</td>
<td>17.3</td>
<td>49.0</td>
<td>16.3</td>
<td>3.615</td>
<td>1.017</td>
</tr>
<tr>
<td>Teachers send learners performance to parents via emails and text messages</td>
<td>1.9</td>
<td>22.1</td>
<td>13.5</td>
<td>50.0</td>
<td>12.5</td>
<td>4.090</td>
<td>1.035</td>
</tr>
<tr>
<td>By utilizing computers and smart phones, teachers develop innovative tests for learners</td>
<td>1.9</td>
<td>21.2</td>
<td>7.7</td>
<td>29.8</td>
<td>39.4</td>
<td>3.836</td>
<td>1.215</td>
</tr>
<tr>
<td>Integrating ICT in assessing learners helps to deliver traditional assessment formats more effectively</td>
<td>1.0</td>
<td>18.3</td>
<td>16.3</td>
<td>42.3</td>
<td>22.1</td>
<td>3.663</td>
<td>1.048</td>
</tr>
<tr>
<td>The workload in assessment is decreased with the introduction of ICT</td>
<td>3.8</td>
<td>11.5</td>
<td>7.7</td>
<td>55.8</td>
<td>21.2</td>
<td>3.860</td>
<td>0.897</td>
</tr>
</tbody>
</table>

Source: Research Data (2019)

The data in Table 4.3 sought to establish the integration of ICT in assessment of learning in early learners. The results show that using ICT in actual instruction has a positive influence on children performance (Mean = 4.231, SD = 0.895). The respondent instructors further asserted that by utilizing computers and smart phones, teachers develop innovative tests for learners (Mean = 3.836, SD = 1.215) and also integrating ICT in assessing learners helps to deliver traditional assessment formats more effectively (Mean = 3.663, SD = 1.048). ECD teachers in Bungoma also affirmed that the workload assessment has decreased with the introduction of the ICT (Mean = 3.860, SD = 0.897).

However, the teachers indicated that teachers don’t use ICT to store learners assessment records through applications such as word and excel (Mean = 4.615, SD = 1.017) and very few of the teachers send learners performance to parents via emails and text messages (Mean = 4.090, SD = 1.035).

ECD teachers in Bungoma County perceive that ICT can be used to deliver traditional assessment formats more effectively and efficiently and also to change the way competences are assessed and develop formats that facilitate the assessment of competences that have been difficult to capture with traditional assessment formats. ICT can be used to develop tests. Although majority indicated that they don’t use ICT to store learners’ assessment...
The integration of ICT in teaching and learning influences the selection of teaching methods to be used in the classroom. In addition, the integration of ICT into learning leads to innovative methods of teaching and student-centred methods. Nevertheless, according to the experts, the use of technological tools does not boost the quality of early childhood education, but is seen to empower young learners. This emphasizes that technological devices promote a friendly cooperative environment in the classroom, although teachers seemed to agree that, in some instances, they distract the attention of the learners. Lastly, ECD teachers argued that it is essential to integrate ICT into the teaching methods used by ECD in the County of Bungoma.

With regard to the integration of ICT in T / L materials, technological tools can help in the determination of relevant learning outcomes and objectives. Technology also helps in explaining learning habits and can therefore improve learning in a number of ways, such as providing learning content, learning tools, and serving as an instructional medium. The bulk of ECD teachers in the county of Bungoma use smartphones and computers for teaching. Many technologies such as interactive whiteboards, smartphones, video cameras and data projectors are not used at all. The number of engineering devices and techniques that can be used in schooling can be daunting. The multiplicity of options does not always allow teachers to make effective use of teaching aids. The option of teaching aids should be carefully considered and the choice should be sufficient for the planned learning activities Access to an efficient and suitable ICT infrastructure is one of the most important factors contributing to the successful and effective use of IT, but most schools do not have such tools.

The findings show that ECD teachers in the county of Bungoma understand the importance of integrating ICT into early learning evaluation. ECD teachers in the county of Bungoma believe that ICT should be used to implement conventional evaluation formats more accurately and reliably, as well as to improve the way abilities are measured and to establish models that promote the appraisal of competencies that have been challenging to catch in traditional assessment models. Although most ECD teachers do not use ICT to store student assessment documents via software such as Word and Excel, and very few teachers submit student performance to parents via emails and text messages.

5.2 Recommendation
Based on the findings, the study recommends the following:

i. The ministry of education together with the county government to recognizing the critical role of technology in teaching and learning. Provision and facilitation of ICT training and induction of educational software training for instructors in order to improve their ICT capabilities and usage. This can be achieved through regular seminars and workshop training on the type of educational software and the appropriate devices.

ii. Teachers to identifying specific barriers to technology integration and different approaches to overcoming the barriers in their own classrooms.

References


