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# Examining Teachers' Awareness of the Digital Content to be Integrated in the School Curriculum; the Case of Homa Bay County, Kenya

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**Abstract**

With current changes in the curriculum of Kenya from 8-4-4 to Competency Based Curriculum (CBC), it emerged that digital literacy was a core competency for both teachers and learners. The purpose of this study was to establish the awareness levels of public primary school teachers in using and integrating technology in teaching and learning. The study was conducted in selected public primary schools in Homa Bay County where teachers were sampled from the six sub counties of Homa Bay. It was based on one study objective: To establish teachers' knowledge of video, audio, images, texts and graphics. Data was randomly collected using questionnaires and interviews. Some 362 teachers from a population of 3620 public primary school teachers in Homa Bay County were sampled. Results showed that majority of the sampled teachers (22.9%) were aware of the general digital content such as video, audio, images and texts. On awareness of specific digital components, the results showed that 57 (16.1%) respondents regarded video as the only component of the digital content. Another 10 (2.8%) respondents cited audio as a component of the digital content. Some 46 (13.0%) respondents identified images as the only component of the digital content. Text as a component of the digital content was selected by 37 (10.5%) respondents. The study revealed that 30 (8.5%) respondents mentioned graphics as the sole component of the digital content. It was concluded that teachers needed more hands on experience with technologies to improve their digital competence. Ethical issues such as confidentiality and respect were observed during the study.

**Keywords:** Competency Based Curriculum, digital content, awareness, technology, teachers

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## Introduction

The history and development of technology in aiding the educational process indeed erased any doubt that technology has the potential to revolutionize the traditional teaching and learning process and enhance the pedagogy of teaching through synchronous and asynchronous modes by eliminating unprecedented barriers to education imposed by space and time (Ahmed & Opoku, 2022). Technology based content is presented in a format that is compatible with the technology in use. Such technologies, which include computers, are necessary tools for learning institutions of the 21st century.

The increasing numbers of reforms in the education set up in Kenya has called for the need to adopt technology supported learning (Piper et al., 2017). Such robust usage of technology was meant to address educational problems such as the ever rising numbers of students' population and quality teaching. In addition, the Government of Kenya in its approach to bride the digital gaps in the education sector in the education sector has continuously invested in the Information, Communication and Technology (ICT) infrastructures at all levels of education.

In Kenya, the government of Kenya showed serious commitment in the line Ministry of Education by developing Kenya Education Sector Support Program (KESSP) in 2005 whose main aim was to assist in mainstreaming technology based education into teaching and learning (Karanja, 2018). Alongside this was the commitment of the country to develop ICT policy document in 2006 which was revised in 2019 as a national priority that gave out a clear road map on the implementation of ICT in the education sector and beyond (Kiarie, & Jones, 2024). It was also worth noting that both primary and secondary schools in Kenya were applying ICT in admitting students in government sponsored schools, checking on the availability of places for admission in such schools, monitoring updates on school information, availing school curriculums online and checking examination results (Manyasa, 2022).

The integration of technology did not stop at the secondary schools only. In 2013, the Government of Kenya made a critical decision to digitalize all public primary schools in Kenya by providing them with laptop computers and tablets. This required digital content experience on both the side of the teacher and the learner (Omito et al., 2019). Going by the demands of Sustainable Development Goals (SDGs) number 4, 8 and 10, where learning institutions were viewed as agents of change (Prieto-Jiménez et al., 2021), technology has played a major role in reshaping quality education at all levels of education in the world. It is on this basis that this study was considered necessary for school teachers who were considered instrumental in the education process of our children.

### Statement of the problem

The Government of Kenya was noted to be very committed in the rollout of technology driven teaching and learning in all public primary schools in Kenya. Electricity connected to most public primary schools in Kenya. Laptops and tablets equally supplied to schools and storage facilities for such devices built in most public primary schools. In short, teaching and learning using digital devices were on in all public primary schools in Kenya commenced in 2016. However, it wasn't clear to this study whether teachers in these schools who were expected to be facilitators of e-learning were well equipped with the required digital content skills for operating videos, images, texts and graphics. This was an issue that the study was out to investigate.

### Purpose of the study

The purpose of the study was to assess public primary school teachers' awareness of the digital content to be for teachers and learners that connect theory and practice that could cultivate their understanding of digital pedagogy and support their development of digital literacy skills (Nyaundi, 2018). Digital content readiness is a component of e-readiness. UNESCO Institute for Statistics (2015) defines e-readiness as a measure of the degree to which individuals are prepared to partake electronic activities for purposes of learning or teaching and benefit from an ICT such as laptop computers in education.

Digital content could be synchronous or asynchronous. Both synchronous and asynchronous models are considered useful in helping teachers consider ways of utilizing online resources, assessing learning and communicating with stakeholders on various degrees of digital integration (Moorhouse & Wong, 2022). School teachers in Kenya should, therefore, be exposed to both flexible real time and asynchronous ways by use of computers directly linked to Kenya Institute of Curriculum Development (KICD) to deliver digital content and at least be assessed keenly to ensure that the technology used for teaching and learning are both supported at the dissemination and receiving ends of the digital content. That is, the point of teaching using technology and the point of reception by the learners in a classroom should be both dialogical and transactional with a view of bringing onboard transformative education (Achuthan et al., 2024).

**Teachers' awareness of the digital content in Africa and other parts of the world**

About ninety percent of the people in the world who were educated in the past learnt how to read, write and do arithmetic by means of traditional learning tools such as blackboards, textbooks and classrooms. However, with the advent of powerful information and communication tools, the traditional perspectives of education have been greatly disrupted (Van Lieshout et al., 2018, p. 3). Educational technology is a branch of ICT which is displayed inform of books, writing, telephone, television, photography and databases, and is sometimes organized into one single package called digital content (Omanga, 2018).

In the United States of America (U.S.A), digital platforms had proven to be more effective in the provision of many opportunities for teachers and students to practice typing, editing, capturing information and publishing anytime anywhere. In a study conducted to determine the teachers' participation in marking of learners work and engagement in professional development using a chi-square, a significant association was found, $\chi 2(5) = 23.84$, $p < .05$; that is, teachers were currently more likely to use digital resources to grade or mark student work than they were prior to the COVID-19 pandemic. Likewise, another significant association emerged, $\chi 2\ (5) = 18.63$, $p < .05$; that is, teachers were currently more likely to use digital resources to engage in professional development than they were prior to the COVID-19 pandemic (Courtney et al., 2022).

In comparison to the U.S.A., the developers of digital content such as KICD in Kenya also needed to develop digital courses that constantly engaged learners by giving them greater opportunities to manage their learning process. Already KICD had, in conjunction with publishers, developed digital content for the 8-4-4 curriculum and Competency Based Curriculum (CBC) in Kenya and pre-loaded the same to the computing devices through Kenya Education Cloud (Kenya. DLP Secretariat, 2016, p. 17; Republic of Kenya, 2015; Groeneveld et al., 2021). Interactive animations, videos, audios, cartoons, exercises and quizzes were also reported to have been included in the Kenyan Digital Literacy Programme (DLP) digital content by KICD to improve the learning experience (Oduor, 2015). In support, digital content could include text, simulations, animations, presentations, tutorials, collections, resources, subject and task-specific cognitive tools, references, assessments (quizzes/tests/exams), and readings (Burns, 2011), which could be integrated into graphics, audio, texts and videos into a single training package in a computer to form educational multimedia (Suryawanshi & Suryawanshi, 2015; Ciascai & Marchis, 2008).

A post positivist study that was conducted in South Africa which involved 191 respondents who were teachers were sampled in the nine provinces where emphasis was given to teachers in urban areas (68.06%), Gauteng (45.03%) and the Western Cape (21.47%) where it was perceived that ICT was intense, found that 19.42% of participants found that technology had most significant impact on teaching and learning mathematics. This demonstrated the commitment of the African continent on the awareness and demands of online education at all levels of education (Graham et al., 2021). Therefore, for effective delivery of online education, digital content should be similar in coverage and content as in traditional textbook courses. The DLP devices in the Kenyan context were preloaded with content and were supposed to be distributed to the learners in classes as per the numbers and streams (Kenya. DLP Secretariat, 2016, p.22). The main difference between the hard copy textbooks and the digital content is that digital content is organized in multiple formats, use a variety of activities, and accessible through a number of technologies to allow for customized learning experiences. Digital learning materials like electronic textbooks have been arranged in interactive formats (Engbrecht, 2018). Wanzala (2015) added that digital content for DLP included interactive animations, videos and audio, cartoons, puppets exercises and quizzes aimed at helping pupils learn.

According to UNESCO Institute for Statistics (2015), Rwanda was the only country that appeared to be a notable exception in the African region in terms of teachers' awareness and usage of digital content by use of laptop computers in primary schools. Data from UNESCO Institute for Statistics (2015) showed that the learner-to-computer ratio in Rwanda was relatively low at 15:1 in the primary and secondary levels, but access to the internet remained a significant challenge for both teachers and learners to access digital content. Fewer than 6% of primary schools and 18% of secondary schools were connected to the internet. A long side Rwanda, countries such as Nigeria, Ghana and Ethiopia also rolled out laptop computer programmes in their respective countries in 2005 but did not pick up in the right pace. In particularly in Ghana where majority of students did not believe that online education would be better than the traditional approach (Adarkwah, 2021). Only a few of the students who participated in the study believed students' outcomes in the online learning would

be better than the traditional approach.

Content delivered to learners can be in the form of print, audio, visual, audio visual or multimedia (Van Lieshout et al., 2018, p. 4). Under the old correspondence model, print technology surrounded the whole area of teaching and learning. Print media, which was the oldest form of content presentation was associated with the production of hard copies. Reddy and Manjulika (2002) stated that the development of print model started with two major events. In one instance, Moses received a set of instructions through two tablets of engraved stones on front and back sides by the finger of God at Mount Sinai. However, the media landscape has undergone a complete metamorphosis where internet has revolutionized the gathering and dissemination of information in various digital formats. Despite all these, print media has flourished the new era digital media platforms (Udenze, 2019) because of its access to the remotest parts of the world with limited access to access and power where a number of schools still exist and learning has to go on uninterrupted. In fact the utilization of print media was spotted in the Holy Bible when the epistles (sacred) letters of St. Paul were sent to churches of God in Corinth, Galatia, Ephesus, Philippi, Colosse and Thessalonica to educate the people (Reddy & Manjulika, 2002, p. 658).

The packaging and development of media platforms has revolutionized the approach of teaching and learning. On the rise now is the use of social media such as WhatsApp, Facebook, Twitter, YouTube and many others which have been found to either facilitate or hinder successful learning experiences which were packaged for both asynchronous and synchronous learning (Haque, 2023). With or without challenges, the development of educational media has reorganized the order of thinking for both learners and teachers because at one point, teachers struggle to learn and master new digital packages leave a lone the content they carry and the failure to acquire the new skills of manipulating technology has led to frustrations, underperformance and low work morale due to resistance to learn and adopt new technology. Dincher and Wagner (2023) added that new technologies can develop their potential only to the degree that they are adopted and utilized by employees, which implies the need to study the underlying factors potentially hindering employees to do so.

**Teachers' awareness of the digital content in Kenya**

The importance of digital content for various levels of education in Kenya was articulated in the Education Reform Framework (ERF) and the ICT policy 2006 including the revised ICT policy of 2019 which was on education quality, delivery, governance and imparting of soft skills to learners (Kiarie & Jones, 2024; Oduor, 2015). Learners, therefore, needed to be prepared for a successful adulthood in a world that is increasingly being saturated with digital technologies (Nyaundi, 2018).

The development of non-interactive radio programmes began as early as 1920 when the British Broadcasting Corporation (BBC) began broadcasting educational radio programmes for schools in the 1920s. The first adult education radio broadcast from the BBC in 1924 was a talk on 'Insects in Relation to Man' (Ribba, 2019). This development was followed by the introduction of television for use in education in the 1970s which according to Bates (2014) was dominated by international agencies such as the World Bank and United Nations Educational, Scientific and Cultural Organization (UNESCO).

Television which could be used to pass audio visual content to learners quickly faded when its access in developing countries such as Kenya was limited due to lack of electricity, cost, security, resistance from local teachers, and absence of a local language for communities (Asiago et al., 2014). These barriers minimized the use of video content in developing countries, but equally promoted the use of radio since most radios are portable and use dry cells as their source of energy.

The Kenyan educational system before the promulgation of the constitution of 2010, majorly depended on print media inform of hard copy books with illustrations and pictures as a way of disseminating knowledge to different parts of the country (Njoroge, 2019). Educational radio and televisions programmes were meant to make up and supplement content that could either not reach a section of the student population or complement what has been taught by the teacher in the classrooms.

Ribba (2019) alluded that both radio and television transmissions were supported by signet which were mostly channeled through EDU networks stationed at Kenya Institute of Curriculum Development (KICD). With the change of the Kenyan curriculum from 8-4-4 to Competency Based Curriculum (CBC), a paradigm shift was noted in the education sector

in Kenya where emphasis was given to competencies of the 21st century of which digital literacy was considered as a core competency and this left Kenyan teachers with no option but to be technologically literate (Republic of Kenya, 2017). This was complimented by the fact that social media platforms which became very popular among the students' population at all levels had put students a head in terms of engagements with the digital platforms (Ramasamy, 2020).

In summary, Bayne and Gallagher (2021) saw a problematic future for teaching and learning in situations where teachers would fail to adjust to the ever changing technological trends, it would most likely that the teachers' responsibilities would be delegated algorithm. This is because some studies had failed to exactly see the roles of teachers during the implementation of DLP where the content was treated as source of entertainment for the pupils instead of being used as a learning tool (Wanzala &Nyamai, 2018). It should, however, be noted that education being at the epicenter of all productive sectors of the economy all over the world, acceptance and adoption of technology in every sector of the economy was inevitable (Omito, 2018).

## Methodology

The study adopted a mixed method research approach where qualitative and quantitative data were collected and analyzed almost at the same time. The researcher adopted this research approach to eliminate biasness that could result from the lapse of time.

### Population

The population of the study consisted of 3620 primary school teachers in public primary schools in Homa Bay County in Kenya.

### Sample size

According to Singh (2010) a sample size of between 10-20% is reasonable and adequate in descriptive research. In this respect, the researcher randomly picked 362 teachers from public primary schools in Homa Bay County as respondents. Some 6 teachers were also randomly picked from each of the six sub counties of Homa Bay for interviews.

### Data collection tools and data collection procedures

Data was collected using questionnaires and interviews. The randomly picked teachers from different schools in different sub counties of Homa Bay were issued with questionnaires which they filled and returned to the researcher. The six selected teachers for interviews were also picked from every sub county of Homa Bay. The researcher ensured that those who participated in interviews were not given a chance to fill questionnaires.

### Pilot study

Pilot studies were taken where 10% of the sample sizes of the sampled teachers were issued with questionnaires and one teacher was randomly picked for interviews. The researcher ensured that the teachers who participated in piloting did not participate in the main study. Validity and reliability were tested and the instruments were found to be valid and reliable.

### Data analysis and ethical concerns

Quantitative data was analyzed using descriptive statistics with the support of Statistical Package for the Social Sciences (SPSS). Qualitative data from the interviews were recorded, transcribed, organized into thematic areas and reported. Ethical issues such as confidentiality, anonymity and respect were observed across the entire research process.

## Study Findings

The study listed a number of variables that were considered as components of digital content used for teaching and learning using laptop computers. These included video, audio, images, texts and graphics.

**Table 1.**
***Teachers' responses on awareness of the components of the digital content***

| Component(s) of the digital content | Frequency | Average % |
|---|---|---|
| Non-response | 17 | 4.8 |
| Video | 57 | 16.1 |
| Audio | 10 | 2.8 |
| Images | 46 | 13.0 |
| Texts | 37 | 10.5 |
| Graphics | 30 | 8.5 |
| All of above (video, audio, images, texts and graphics) | 81 | 22.9 |
| Video and audio | 7 | 2.0 |
| Video, audio, images, and texts | 7 | 2.0 |
| Video and graphics | 1 | 0.3 |
| Images, texts and graphics | 7 | 2.0 |
| Video, images and texts | 5 | 1.4 |
| Video, audio and texts | 5 | 1.4 |
| Audio, images, texts and graphics | 7 | 2.0 |
| Video, images, texts and graphics | 2 | 0.6 |
| Video, audio, images and graphics | 5 | 1.4 |
| Audio and images | 3 | 0.8 |
| Audio and graphics | 1 | 0.3 |
| Video, Audio and Images | 8 | 2.3 |
| Video and images | 2 | 0.6 |
| Video and audio | 2 | 0.6 |
| Audio, images and texts | 2 | 0.6 |
| Images and texts | 2 | 0.6 |
| Images and graphics | 1 | 0.3 |
| Texts and graphics | 1 | 0.3 |
| Video, texts and graphics | 4 | 1.1 |
| Video, audio and graphics | 2 | 0.6 |
| Video, audio, texts and graphics | 1 | 0.3 |

*n=353*

The findings from Table 1 indicated that the majority, 81 (22.9%), of the respondents chose all the variables that were listed by this research (video, audio, images, texts and graphics) as components of the digital content. 17 (4.8%) respondents did not respond. The research showed that 57 (16.1%) respondents regarded video as the only component of the digital content. Another 10 (2.8%) respondents cited audio as a component of the digital content. Some 46 (13.0%) respondents identified images as the only component of the digital content. Text as a component of the digital content was selected by 37 (10.5%) respondents. 30 (8.5%) respondents mentioned graphics as the sole component of the digital content.

Other combinations of components of digital contents that were identified by the respondents included: 7 (2.0%) respondents were for audio and video; 7 (2.0%) respondents noted video, texts, audio and images; 1 (0.3%) respondent settled on graphics and videos; 7 (2.0%) respondents viewed images, graphics and texts as components of the digital content; 5 (1.4%) respondents chose video, images and texts; 5 (1.4%) respondents mentioned video, audio and texts;

another 7 (2.0%) respondents identified audio, images, texts and graphics; 2 (0.6%) respondents regarded video, texts, images and graphics as components of the digital content; 5 (1.4%) respondents selected video, audio, images and graphics as components of digital content; 1 (0.3%) respondent was for audio and graphics as the only components of the digital content; 8 (2.3%) respondents selected video, audio and images as components of digital content; 2 (0.6%) respondents selected video and images; another 2 (0.6%) respondents were for video and audio; 2 (0.6%) respondents suggested images and texts; 1 (0.3%) respondent was for images and graphics as components of the digital content; 4 (1.1%) respondents were for video, texts and graphics; 1 (0.3%) respondent chose texts and graphics while 2 (0.6%) respondents settled on video, audio and graphics as digital components. Lastly 1 (0.3%) respondent cited video, audio, texts and graphics as a combination that would be referred to as digital content. 81 (22.9%) respondents, who were the majority, cited all listed variables by the study such as video, audio, images, texts and graphics as components of digital content.

## Discussion

It was established that 81 (22.9%) sample teachers were well informed of the composition of what constitutes digital content as was listed by the study. The respondents' knowledge of video, audio, images, texts and graphics was a good start for digital literacy skills necessary for teachers to utilize in the teaching and learning process. Ironically, the majority of the respondents who were interviewed were unable to mention the components of the digital content with ease verbally during the interviews as they did on questionnaires. This indeed raised some eyebrows and left the study in a dilemma and could not comprehend why it was only possible for the respondents to know the wholeness (digital content) without knowing the components of the digital contents. For instance, a respondent commented:

> It is not yet available in our local schools. Like currently, even if the laptops were brought, we don't have the syllabus with the digital content that shows that we are going to handle. It is not under those people who were trained if at all they were told but currently because nobody has trained. There is no induction. They know computers on their own but not as per the syllabus for the digital content… (Teacher, Suba).

This indeed called for digital awareness campaign among the teachers so that the theoretical aspect could be seamlessly linked to the practical aspect of the digital content. The study emphasized that with the change in curriculum from 8-4-4 to competency based curriculum in Kenya, knowledge and application of digital contents in teaching and learning was no longer luxurious but a necessity for all teachers because digital literacy was among the most relevant competencies of the 21$^{st}$century (Republic of Kenya, 2017). The study noted that it was possible for teachers to raise their digital manipulation skills on their own given that nearly all teachers in one way or the other were accessible to digital devices such as mobile phones and could interact with digital content on various digital platforms (Nyaundi, 2018). In concurrence with the findings of the study, Reddy and Manjulika (2002) asserted that prior knowledge of the digital content was connected to the explosion of knowledge in the 21$^{st}$ century by use of modern communication technologies.

Even though there was a slow pace of integrating technologies in teaching and learning, the study noted that all the components of the digital content under this study (video, audio, images, texts and graphics) were equally necessary for all aspects of learning including delivering a lesson both online and offline at all levels of education. Ahmed and Opoku (2022) supported the utilization of digital education in flexible learning environment supported by technology in developing countries like Kenya where the population was soaring against fewer educational facilities. Besides the flexibility in the arrangement of teaching and learning, digital content makes the work easier for both teachers and learners. At some point, the application of these digital contents to learners has been a source of motivation to learners. Wanzala (2015) was in agreement by observing that digital content for school going children should have included interactive animations, videos and audio, cartoons, puppets exercises and quizzes that aim at helping pupils learn.

## Conclusion

The study noted that even though the selected teachers demonstrated that they knew the different components of different components of digital content necessary for teaching and learning, the degree of knowledge varied. This was interpreted by the study to mean that digital education was also not uniform in schools and teachers could only teach and apply the digital content they were well versed with. It was, therefore, considered necessary for the teachers to get ready for the problematic future in the field of education where if you cannot change with technology then the teachers' role

would be delegated to an algorithm (Bayne & Gallagher, 2021). However, it's necessary to persuade users of technology to change their attitude in the usage of technology for effective delivery of technology based education (Omito, 2018).

***Ethics Committee Approval:*** *National Commission for science and Technology (NACOSTI) approval for this study was received on 28th March 2017, Ref. NACOSTI/P/17/13823/16006.*
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