

Knowledge Sharing ICT Tools in the Managing Explicit Knowledge in Secondary Schools in Meru Central Sub County

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Abstract

Kenya's Vision 2030 acknowledges the centrality of the role of knowledge management systems in boosting international competitiveness, wealth creation and improving the general social welfare. However, the influence of ICT tools for knowledge sharing has not been investigated in Kenyan secondary schools. The purpose of this study was to assess the influence of ICT tools in knowledge sharing for managing explicit knowledge in secondary schools in Meru Central Sub County. Mixed methodology was used to collect data from 16 secondary schools. The schools were sampled using simple random sampling method to sample 30% of the 51 private and public secondary schools to obtain 16 sampled secondary schools. 16 secondary school principals, 143 secondary school teachers, 16 school board chairpersons, and 16 head prefects participated in the study. The teachers were sampled using proportional simple random sampling method. Interviews and questionnaires were used to collect data. Pre-testing was done in Nkuene Girls' Secondary School, Nkubu High School and Ntharene Day Secondary School in Imenti South Sub-County in Meru. These secondary schools were selected using simple random sampling method. Content, criterion and face validity were observed throughout the study. SPSS software version 25 was used to analyze the data. Descriptive statistics such as percentages, frequencies and mean were utilized in analyzing data and the findings presented in tables and explanations. The results showed that many opportunities were lost due to lack of explicit knowledge mechanisms in secondary schools in Meru Central Sub-County. The study recommended adoption of developed ICT framework for knowledge sharing.

Keywords: *ICT Tools, Knowledge Sharing, Explicit Knowledge, Secondary Schools, Meru Central Sub County.*

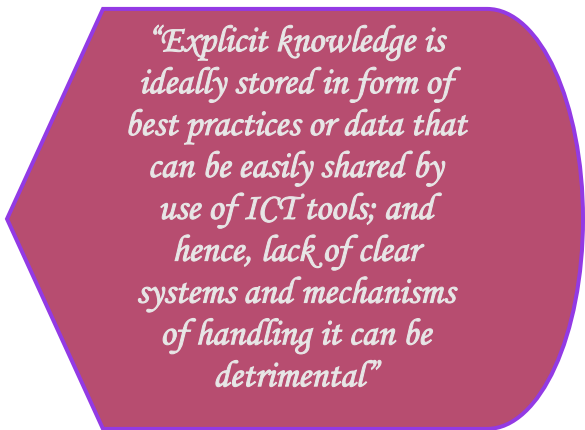
1.0 Introduction

Knowledge sharing refers to the process through which information is transferred from one person to another within or outside the institutions (Lyra et al., 2017). The transfer of knowledge can be at peer level or senior level of interaction. Knowledge is shared through conversations, meetings, learning sessions, workshops, and seminars (Igbinovia & Osuchukwu, 2018). Shared knowledge is key in ensuring familiarization of employees to an institution's procedures (Kalema et al., 2017). For instance, in learning institutions, employees rely heavily on knowledge acquired through experience, skills and abilities. Explicit knowledge can easily be articulated, codified, stored and accessed. It can also be transmitted to other forms like media videos and audios (Kalema et al., 2017). Learning institutions get competitive advantage when knowledge within the scope of its operations is effectively managed. Global organizations keep on striving towards ensuring knowledge is effectively managed and shared.

In America, secondary schools are experiencing difficulties in coming up with practical relevance of knowledge to its current educational activities and unsatisfactory complement of knowledge management operations within the dynamic Information Technology (IT) (Gürlek & Çemberci, 2020; Sahibzada et al., 2020). In Europe, issues such as poor funding and support from the senior management in the institution constitute challenges facing knowledge sharing (Sahibzada et al., 2020).

In Asia, knowledge sharing challenges include failure to to customize knowledge management systems to fit unique needs of the institutions (Gonzalez & Melo, 2018).

In South Africa, the most common knowledge sharing challenges include lack of proper training among users on the new knowledge management systems, inadequate funding, and poor monitoring and evaluation of systems (Gillman et al., 2020). In Ghana and Nigeria, poor government policies, high cases of cyber theft, and lack of an integrated technique to link indigenous knowledge to current knowledge systems have been prevalent (Ogbonna, 2020). In Northern Africa countries such as Morocco, Algeria and Tunisia, there have been a culture of institutions resisting change, and unavailability of updated knowledge sharing resources (Alvarenga et al., 2020; Pineda et al., 2020).



“Explicit knowledge is ideally stored in form of best practices or data that can be easily shared by use of ICT tools; and hence, lack of clear systems and mechanisms of handling it can be detrimental”

In Kenya, Vision 2030 acknowledges the centrality of knowledge management and sharing in boosting international competitiveness, wealth creation and

improving social welfare in different sectors (Ministry of Education, Kenya, 2018). With recent advances in internet technologies, the concept of sharing knowledge has exceeded major organizational as well as physical community contexts. Indeed, knowledge sharing has become a global and social context and concern in terms of online virtual communities.

However, ICT tools in knowledge sharing have not been well articulated in both public and private secondary schools in Kenya. Notably, there are a lot of challenges on how to implement explicit knowledge management practices (Ministry of Education, 2018). Literature shows that explicit knowledge management requires proper harnessing of ICT tools in knowledge sharing mechanisms (Lyra et al., 2017). Explicit knowledge is ideally stored in form of best practices or data that can be easily shared by use of ICT tools; and hence, lack of clear systems and mechanisms of handling it can be detrimental (Lyra et al., 2017).

Several studies have been carried out on explicit knowledge management concept, but within limited contexts. Flor (2019) and Gillman et al. (2020) concentrated on corporate centered frameworks, while Nguyo et al. (2015) and Njoka (2016) focused on readiness and the extent of adoption of knowledge management in organizations in Kenya. None of these studies have investigated knowledge systems that are intended to leverage on sharing. This study aimed to address the above gap and propose an ICT tool in knowledge sharing for the management of explicit knowledge in public

and private secondary schools in Meru central sub-county. The study sought to answer the question: how does ICT tools influence knowledge sharing in secondary schools in Meru central sub county?

Overview of literature

Venkatesh (2003) Unified Theory of Acceptance and Use of Technology (UTAUT) explains the motivation for using information system and the subsequent user behavior. For an ICT system to be considered successful when introduced in an organization, the users must be willing to use it and share frequently in their operations. The theory explains the importance of using ICT resources in maintaining and keeping of both the individual and the hierarchical information in an effective retrievable and transferrable structure. For reliable, and safe structures to be put into place, organizations must be willing to frequently use various storing units with huge storage such as cloud.

According to Konig et al. (2020), there is a dire need for high school teachers in Germany to adapt online teaching so as to facilitate knowledge sharing in the wake of covid-19 pandemic. Konig et al. (2020) evaluated how high school teachers have been adapting and sharing knowledge with students during covid-19 school closure in Germany. They noted that after covid-19 struck, teachers began to use online platform to teach and meet students. After assignments are sent to students via emails direct consultation is done via telephone or through video conferencing facilities.

Lin and Huang (2020) reviewed how knowledge sharing impacts personal learning among students in Taiwan universities. The study picked 218 students who were pursuing undergraduate business degrees from two universities to answer the questionnaire of the study. Lin and Huang (2020) established that when students frequently share knowledge amongst themselves, they improve their various personal learning initiatives. According to them, the extent of knowledge sharing was greatly hampered when unreliable knowledge found its way among students. However, they did not describe how the study sampled 218 students and what the original target population was.

Idhalama and Echedom (2021) scrutinized the level of awareness of Nigerian teachers on knowledge sharing behavior in high schools. Adopting a descriptive research design, the study collected data from 244 teachers. Their study reported that knowledge sharing awareness was high. Further, sharing behavior between experienced and less experienced teachers was similar high. However, school policies limited the extent of knowledge sharing. Idhalama and Echedom (2021) did not investigate knowledge sharing behavior and awareness among the non-teaching staff in secondary schools.

In Kenya, Kimile et al. (2020) examined how public universities community of practice (CoPs) had been sharing information within the university environment. According to Kimile et al. (2020), CoP is formed when a group of people came together to learn and interact with each other to develop and

advance what they know, especially on shared interest in an area. The study used secondary data from written journals and books. It established that universities were allowing socialization and sharing of information through emails, WhatsApp, text messages, phone calls, discussion groups and lectures. The study noted that inconsistency in incentives leading to pre-mature withdrawal from knowledge sharing by staff, lack of enough time to articulately share all information, insufficient ICT infrastructures and meeting spaces were challenges associated with knowledge sharing.

Kipkosgei et al. (2020) evaluated how knowledge sharing affects trust among employees sharing a set of technology in Kenya. Their study investigated 300 employees who were grouped into 75 teams. These teams were analyzed using hierarchical multiple linear regression. The study noted that whenever there was knowledge sharing, trust was cultivated to a point that they were free to inquire on areas they did not know in their tasks. This led to an improved growth in the overall firm's targets since the employees easily achieved their set target.

2.0 Methodology

This study adopted mixed methodology research design; both quantitative and qualitative data was used. Data was collected from a population of 51 public and private secondary schools. A 30% sample was obtained using simple random sampling technique. This translated to 16 secondary

schools. The study further used systematic proportionate sampling technique to select respondents from schools in each stratum. The strata were boys, girls or mixed and day secondary schools. The 16 school board chairpersons, 16 head prefects and 16 principals of secondary schools were purposely selected, while 143 teachers were selected using systematic sampling technique from a given stratum. Interviews and questionnaires were used to collect qualitative and quantitative data respectively.

Pre-testing was done in Nkuene Girls' Secondary School, Nkubu High School and Ntharene Day Secondary School in Imenti South Sub- County in Meru. These secondary schools were selected using simple random sampling technique and they were not included in the study population. The pre-test respondents were 1 principal, 1 teacher, 1 school board chairperson and 1 school head-prefect in each of the three secondary schools. They were all sampled using purposive sampling method. Cronbach alpha Coefficients was computed to characterize the authenticity and internal consistency of the instruments. Content, criterion and face validity were also ensured before implementing the actual study. SPSS

Table 1

Response Rate

Sampled population	Sample size	Responses
Principals	16	14
School board chairpersons	16	10
Teachers	143	122
School head prefects	16	16

From a total of 192 respondents who were to be interviewed, only, 14 principals and 10

software version 25 was used to analyze the quantitative data. Descriptive statistics such as percentages, frequencies and mean were utilized in the analysis the quantitative data. Thematic analysis technique was utilized in analyzing the qualitative data. Tables, explanations, excerpts and identified themes were used to present the findings of this study.

3.0 Results and Discussion

Background information

The study conducted pre-test interviews to the principals and school board chairpersons, while the teachers and school prefects answered pre-test questionnaires. The Cronbach Alpha values for the questionnaires which had ICT tools in knowledge sharing, and management of explicit knowledge had Cronbach alpha value of 0.84 and 0.79 respectively. The Cronbach alpha value for the interview instruments was 0.797. These results indicated that the questionnaires and interview guides were reliable as noted by Taber (2018). The study had sampled 16 principals, 16 school board chairpersons, 143 teachers and 16 school head prefects. Table 1 indicates the response rate

board chairpersons agreed to be interviewed, which totalled to 24 representing 75%

response rate. One hundred and fifty-nine (159) respondents who were 143 teachers and 16 school head prefects were issued with the questionnaires, out of who, 122 teachers and 16 head prefects answered the questionnaires, totalling to 138. This was 87% response rate. These results show that there was an excellent response rate as stated by Meterko et al. (2015) who avers that a 70% response rate is considered excellent.

Descriptive Statistics on Implementation of Explicit Knowledge Management

Implementation of explicit knowledge management was the dependent variable in this study. The study collected data using questionnaires and interview method. The questionnaire was closed-ended and had various statements that the respondents were supposed to tick a choice: 1 = strongly disagree, 2 = Disagree, 3= neutral, 4= agree and 5 = strongly agree as indicated in Table 2.

Table 2

Descriptive Statistics of Implementation of Explicit Knowledge Management

Statements N=138	1	2	3	4	5	Mean
E-learning in knowledge creation have improved explicit knowledge	73(53%)	58(42%)	0(0%)	7(5%)	0(0%)	2.02
E-libraries in knowledge storage have improved explicit knowledge	2(1%)	28(20%)	0(0%)	69(51%)	39(28%)	3.80
Knowledge sharing tools such as g-mail and zoom have improved explicit knowledge	2(1%)	2(1%)	0(0%)	14(10%)	120(88%)	4.78
Reliable framework has improved explicit knowledge	10(8%)	50(36%)	3(2%)	72(52%)	3(2%)	3.05
School values supports knowledge management	7(5%)	56(41%)	0(0%)	70(51%)	5(3%)	3.07
Management of knowledge methods are well known	3(1%)	3(1%)	0(0%)	37(28%)	95(70%)	4.61

As indicated in Table 2, out of the 138 teachers and students who answered the questionnaires, 14 (10%) agreed and 120(88%) strongly agreed at a mean of 4.78 that ICT tools in knowledge sharing such as g-mail, zoom and google meet had improved explicit knowledge management in their school. That notwithstanding, the same respondents did not highly tally as compared to other statements that ICT tools such as e-learning systems in knowledge creation had improved explicit knowledge management in their schools. Seventy-three (53%) strongly disagreed and 58(42%) disagreed; hence, a low mean of 2.02.

This implied that e-learning was not yet fully operational in secondary schools in Meru Central Sub-County. There were still major set-backs that hampered use of e-learning systems in disseminating explicit knowledge in secondary schools. Maisamari et al. (2018) also realized similar results, and provided evidence that Nigerian’s secondary school teachers had not yet familiarized themselves with the ICT systems and operations. This stressed the need to equip teachers with new ways of teaching, requiring them to orient students on online teaching.

The study interviewed principals and school board chairpersons. The first question required them to explain how their schools ensured that users’ enthusiasm was maintained when using ICT tools. They indicated that there was an established computer department where users, such as students, received free computer classes and that there were qualified computer teachers. In South Africa, Ojo and Adu (2018) pointed

out that high school students learnt more through use of ICT when computers were readily available, and a computer teacher was also available to guide them on what to do in case they were stuck. Respondent 13 was quoted saying,

“Our institution has made efforts to create students and staff emails through the computer department. These emails are used to send and receive documents such as assignments, personal emails, exam results, fees statements, and any other academic related materials”.

The second question required them to state ways in which the school administration enhanced proper document management as a way to attain the school’s vision. While answering the question, respondent 7 stated,

“We have created a school website that has one stop services such as having knowledge portals of e-past papers. This enables students avoid much paper work and can easily filter the relevant exams as they prepare for their examinations”.

Other respondents indicated that there was a school staff who was given the responsibility to manage documents. In addition, there was an aerated store established to keep different documents; and that there was presence of document issuance log-book that required users of documents to fill in their details for accountability. The study by Odeniyi and Adeyanju (2020) concurred that proper records management was a simple task that

could be practiced in areas such as stores, and that a responsible staff would be in charge of whatever comes in and goes out as far as documents are concerned.

The third question required them to comment on the frequency of training of teaching staff on manuals management. The respondents gave different timelines but the major timelines given were semi-annually and annually. This was because many schools felt that it would give both parties (the teachers and management) time to apply the skills towards management of manuals over a substantive period of time. According to Yoo et al. (2020), when schools valued their teaching and non-teaching staff, they provided retreats, trainings, workshops, and seminars to equip them with leadership skills so as to offer well thought direction to students who relied upon them for scholarly excellence.

The fourth question required the respondents to explain the various sources of funds used to equip ICT department. The respondents named the Ministry of Education (MOE), sponsors, donors, parents, alumnae, community and well-wishers. Zhang et al. (2020) also established that China education

emergency management relied on China’s Education Ministry, sponsors and donors to fund various public institutions such as secondary schools, particularly in equipping ICT infrastructure.

The fifth question required them to mention the procedures used to monitor and evaluate the school’s ICT systems. The steps were majorly on four areas, namely; identifying goal of the knowledge sharing system, examining the achieved goals, realizing the unachieved goals and the challenges faced, and providing solutions to the challenges so as to achieve both short-term and long-term goals.

Descriptive Statistics of ICT Tools in Knowledge Sharing for Managing Explicit Knowledge

ICT tools in knowledge sharing was the independent variable in this study. The study used questionnaires and interview method. The questionnaire was closed-ended and had various statements that the respondents were supposed to choose from: 1 = strongly disagree, 2 = Disagree, 3= neutral, 4= agree and 5 = strongly agree as indicated in Table 3.

Table 3

Descriptive Statistics of ICT Tools in Knowledge Sharing for Managing Explicit Knowledge

Statements N=138	1	2	3	4	5	Mean
Emails have enabled teachers and student communicate	0(0%)	0(0%)	0(0%)	44(32%)	94(68%)	4.68

Students share knowledge through social networks	44(32%)	92(66%)	0(0%)	1(1%)	1(1%)	2.04
Management has been sharing knowledge to teachers through seminars etc.	0(0%)	0(0%)	0(0%)	38(27%)	100(73%)	4.73
ICT tools such as g-mails have boosted sharing awareness	2(1%)	2(1%)	0(0%)	27(20%)	107(77%)	4.68
Improvement of academic performance due to access of shared knowledge	2(1%)	2(1%)	0(0%)	37(27%)	97(71%)	4.61
Support from the government to increase innovation	2(1%)	2(1%)	0(0%)	13(11%)	120(87%)	4.78

As indicated in Table 3, the respondents agreed that the government has been offering financial support to boost and increase innovation on knowledge sharing through ICT tools (mean 4.78). Additionally, they also agreed that the management has been sharing knowledge with teachers through training platforms, workshops, seminars, direct talks and workshops (mean 4.73). However, they did not come to an agreement that students were encouraged to share knowledge amongst themselves through social networks (mean 2.04).

This was because the students did not understand the relevance of sharing knowledge in the first place. There was so much focus in their schools on improving their grades and academic performance to

obtain university entry points. This focus was conspicuously monopolistic to a point that students missed out on more important aspects in life, such as sharing what they know with others through social networks. In fact, what they did on social networks was more of posting photos and visiting social media influencers' pages.

A recent observation made by Carter and Kaba& Ramaiah (2020) indicated that students have never been sensitized on how they could use social media to their advantage. This has led to abuse of social media platforms when they get a chance. As a result, most secondary school environments discourage the use of mobile phones in the learning process. The study made efforts to interview principals and

school board chairpersons. The first question required them to comment on how their secondary schools have been sharing knowledge through ICT tools during the covid-19 pandemic. They indicated that they mainly relied on emails, local radios, phone calls, text messages, WhatsApp groups and Facebook pages. According to Khamali and Thairu (2018), when there was an increased awareness among lecturers on various knowledge sharing alternatives in ICT, behavior of the students was significantly influenced. This was because students were generally curious on the contents of shared knowledge in their most preferable platforms. For example, the students would be more excited if the lecturers sent assignments through emails rather than making them carry countless paper work on the same assignment.

The second question required them to explain various forms of passing information used in their schools. These included teaching, talking/ conversation, writing, posters, television/ radio adverts, poems, photos, singing, and preaching. The third question required them to mention various approaches that the management use when sharing knowledge using ICT tools with external stakeholders. These included emails, WhatsApp and Facebook posts, telephone calls, text messages, updating websites, and printed out documents. Kipkosgei et al. (2020) indicated that the choice of a method of sharing knowledge was based on its ability to cultivate trust amongst the users.

The fourth question required them to name the challenges the schools faced when

knowledge sharing using ICT tools in the school was not present. These challenges were lost opportunities, increased costs, poor interpretation, unawareness on the content of the knowledge intended to be shared, and loss of precious time. Gillman et al. (2020) also found out that when knowledge was not managed well, projects tended to be more costly since there was no common interpretation on what to do. This resulted to errors and inconsistencies in delivering agreed results.

The fourth question required them to name the contributions made by the government pertaining Information Communication Technology (ICT) tools installation in the school. The contributions included donation of computers and other (ICT) peripherals, increase in resource allocation such as money; employment of more computer teachers under the Teachers Service Commission [TSC], and supply of cabled internet under the ministry of communication. Communication Authority of Kenya (CAK) (2020) indicated that the government of Kenya had made efforts to ensure public secondary schools were equipped with cable connection to boost their education broadband. In addition, the package came with budgetary allocation to these schools to facilitate full installation.

The study had a question that required an explanation given by principals and board chairpersons on how Information Communication Technology (ICT) tools influenced knowledge sharing in management of explicit knowledge in secondary schools in Meru Central Sub

County. It was established that ICT tools reduced time wasted when sharing knowledge, improved awareness and enhanced accountability of actions resulting from the shared knowledge.

Further, in linking the study to unified theory of acceptance and use of technology, various knowledge sharing methods are highly related to whether the users have accepted it or not. On the one hand, teachers' use and acceptance of ICT tools such as Google meet will determine which tools to use in setting up meetings, workshops, seminars or learning sessions. On the other hand, students' acceptance level of use of a system such as internet in making learning related conversation. If they have not accepted it, they will hardly use it when making conversations.

4.0 Conclusion

The study concluded that ICT tools in knowledge sharing in schools was instrumental in improving academic performance of learners. Hence, failure to come up with ICT frameworks that expose students to share knowledge was detrimental to their performance. Further, the study noted

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that there were neither policies nor guidelines on how to develop, implement and review frameworks in the secondary schools. This made it hard for the senior management to provide direction on what to do since every member of the team had their own approach to issues. This resulted to disagreements and conflicts that suspended knowledge sharing.

5.0 Recommendations

Principals and teachers should come up with campaigns on how students could use social media to expand knowledge sharing avenues. Students should also be each other's keeper on social media use. This will enable them become disciplined and active in sharing knowledge. Additionally, the Ministry of Education should liaise with the ICT ministry to fast track the broadband connectivity project to secondary schools in Meru County. This will enable them have reliable internet to share knowledge. The principals and board members should also use their social networks fundraise for ICT infrastructural system that enhance knowledge sharing. The study further recommended adoption of developed ICT framework for knowledge sharing.

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