# Adoption and Use of ICT in Enhancing Management of Public Secondary Schools: A Survey of Kesses Zone Secondary Schools in Wareng District of Uasin Gishu County, Kenya

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## ABSTRACT

Information and Communication Technology (ICT) has become very necessary in all aspects of life. ICT technical skills are essential in ICT use and application. In order to obtain benefits from using ICT, both ICT technical skills and managerial skills related to ICT are needed. Managerial skills involve management's ability to develop ICT applications to support and contribute to other management functions in organizations. In the field of education, ICT has begun to have a presence but the impact has not been as extensive as in other fields. The study sought to establish adoption and use of ICT in enhancing management of secondary schools in Wareng District. The study adopted a survey research design technique. Six (6) schools were sampled for the study. The target population included 300 head teachers, deputy head teachers, Heads of Departments and BOG members. Fourty two respondents which represented 14 percent were sampled. Data analysis employed descriptive and inferential statistical techniques so as to infer significant relations among the research variables after which results were presented in tables. The study findings established that most of the schools had computers that were used for typing examinations and other secretarial duties other than performing management functions. However the level of adoption and use of ICT in the management of schools was slightly high in boarding secondary schools as compared to day secondary schools. There was a general agreement among the respondents that ICT adoption and use in schools had remarkable benefits which included: Improved data management, improved communication and effective management of student's records among others. Despite the benefits, the study also revealed that the school management had not fully realized the full potential of adoption and use of ICT in performing management tasks due to several challenges, among them; lack of skills and financial constraints.

**Key words**: Information and Communication Technology-(ICT) and Management of public secondary schools

**Introduction:** The adoption and use of Information and Communication Technology (ICT) is changing business processes, and the way people live and work. New innovations as a result of ICT are continuing to emerge [1]. If one was to compare such fields as medicine, tourism, travel business, law, banking, engineering and architecture, the impact of ICT across the past two or three decades has been enormous. The way these fields operate today is vastly different from the ways they operated in the past. But when one looks at education management, there seems to have been an uncanny lack of influence and far less change than other fields have experienced. A number of people have attempted to explore this lack of activity and influence [1].

As noted in Sessional paper no. 1 of 2005, Information and communication technology has a direct role to play in education and if appropriately used, ICT can bring many benefits to the classroom as well as education and training processes.

" Its use will provide new opportunities for teaching and learning, including offering opportunities for more learners greater opportunity for teacher-to- teacher, and student-to-student communication and collaboration, greater opportunities for multiple technologies delivered by teachers, creating greater enthusiasm for learning among students and offering access to a wider range of courses."[2].

**National ICT Policy on Education:** Kenya disseminated its ICT Policy during the year 2006 [3], with its vision being "A prosperous ICT-driven Kenyan society" and mission being "To improve the livelihoods of Kenyans by ensuring the availability of accessible, efficient, reliable and affordable ICT services." The section on information technology sets out the objectives and strategies pertaining to ICT and education. The section highlights that the government will encourage adoption and use of ICT in schools and institutions of higher learning to improve quality of teaching and learning. The ICT policy states that; lack of a policy framework on e-learning has hampered its development and utilization.

In this regard, the policy outlines that there is need to:

a) Promote the development of e-learning resources;
b) Facilitate Public - Private Partnerships to mobilize resources in order to support e-learning initiatives;
c) Promote the development of integrated e-learning curriculum to support ICT in education;
d) Promote distance education and virtual institutions, particularly in higher education and training;
e) Promote the establishment of a national ICT centre of excellence;
f) Provide affordable infrastructure to facilitate dissemination of knowledge and skill through e-learning platforms;
g) Promote the development of content to address the educational needs of primary, secondary and tertiary institutions;
h) Create awareness of the opportunities offered by ICT as an educational tool to the education sector;
i) Facilitate sharing of e-learning resources between institutions;
j) Exploit e-learning opportunities to offer Kenyan education programmes for export; and
k) Integrate e-learning resources with other existing resources [3].

[4] Posited that Kenya has placed considerable emphasis on the importance of ICT in its Education Sector Support Programme (KESSP) as evidenced in the recent promulgation of the National ICT Strategy for Education and Training. According to him, the Ministry of Education has taken steps to support the implementation of the strategy either by direct action or through the various institutions and agencies with which it works. In addition, there are many other organisations not involved directly with the Ministry of Education that continue to be active in implementing and supporting projects involving ICT in education.

ICT in schools management has been elusive since most of the school management are either computer illiterate or technology ignorant, but the current global technological changes requires modernization and digitalization of almost every sector, be it educational or business. [5] notes that despite the apparent benefits of the use of ICT for educational purposes, studies showed that in many cases, the learning potential of ICT is deprived as many educational administrators are still not fully ICT literate and do not use it in the school management and teaching. It is with this background that the study on adoption and use of ICT in enhancing efficiency of secondary school management in Wareng District was conceptualized.

**Statement of the Problem:** Information communication technology skills play a major role in promoting the economy of a country. Many of the productivity gains in the developed economies over the past two decades can, to a great extent, be attributed to the impact of ICT. The government appreciates and recognizes that, an ICT literate work force is the foundation on which Kenya can acquire the status of a knowledge economy [2].

Education and training has a major role to play in the implementation of ICT policy. To begin with the sector itself is a major use of ICT, not only in education, training and research, but also in the management sector. Secondly, success in the use of ICT in all sectors will require sufficient and competent human resources that is well developed and equipped in the education and training sector. Thirdly, successful introduction and use of ICT in education and training institutions will play a major role in disseminating skills to the wider society and thus create a positive impact to the economy [2]. To achieve this, the government was to partner with other stakeholders in establishing ICT capacities across the country. It was also to facilitate the use of educational institutions as hubs of ICT dissemination as suggested in the Sessional paper No 1 of 2005.

The philosophy of education in Kenya is guided by the realization that technology is a critical form of wealth to any nation. There is a lot of emphasis that is given to ICT as a key pillar of education and training as noted in the policy paper Sessional paper no 1 of 2005. The use of ICT in education lends itself to more student-centred learning settings and this often creates some tensions among some teachers and students, little emphasis is given to the management functions in schools. But with the world moving rapidly into digital media and information, the role of ICT in education management is becoming more and more important and this importance will continue to grow and develop in the 21$^{st}$ century [5].

ICT is used to perform various functions in schools which include; instructional uses such as PowerPoint presentations, examination results analysis, record keeping, timetabling, research work, financial analysis, communication and supervision. But the adoption and use of ICT in secondary school management in Wareng District of Uasin Gishu County in Kenya is faced with many challenges. This has slowed down the expected benefits that would arise from the adoption and use of ICT in the management of schools.

**Purpose of the study:** This paper sought to explore the status of adoption and use of ICT by school administrators in performing management functions, in secondary schools in Wareng District of Uasin Gishu County in Kenya.

**Objectives of the Study:**
1. To investigate the extent of adoption and use of ICT in performing management functions in schools
2. To find out if there is a significant difference on adoption and use of ICT in performing management functions between boarding secondary schools and day schools
3. To determine perceived benefits of using ICT in performing management functions in schools
4. To explore the challenges faced by schools management in adoption and use of ICT in performing management functions.

**Significance of the Study:** The study findings will be expected to be useful to the management of secondary schools in Kenya by identifying barriers that limit the adoption and use of ICT by the management for managerial and instructional purposes. The study findings will bring to the fore the level of ICT adoption and use in schools and thus help the policy makers and planners in ICT policy formulation and implementation by revising the existing ICT policy with the aim of tackling the challenges affecting ICT adoption and use in schools in the country.

The findings of the study will also make management of schools easier and more efficient and effective.

**Theoretical Framework:** This paper is informed by the Technology Adoption Model (TAM) which is an information systems theory that models how users come to accept and use a technology. The model suggests that when users are presented with a new technology, a number of factors influence their decision about how and when they will use it. Technology Adoption Model (TAM) was developed by Fred Davis and Richard Bagozzi [6],[7]. [10] Distinguished the research on the determinants of information technology usage into two streams: those based on intention based model, exemplified by such theories as TAM, and diffusion of innovation, best exemplified by Rogers' diffusion of innovation theory. The TAM proposes two specific beliefs-Perceived Ease of Use (PEOU) and Perceived Usefulness (PU) - that determine one's behavioral intention to use technology as shown in figure 1

**Figure 1: The Technology Adoption Model**
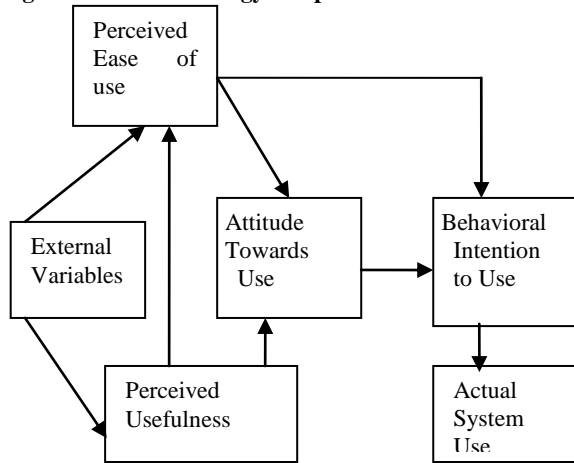


Source: Bagozi *et al* (1992)

**Conceptual Framework:** Management within the sector of services should use ICT because it provides many benefits at different levels [9] operational level, tactical level and strategic level. As figure 2 reveals, the use of ICT in Education management within the sector of services could improve management functions in secondary schools e.g. communication, ability to exchange data, teamwork, customer relations, visibility of services, and competitive advantage etc. This statement is based on the fact that ICT allows schools management to obtain, to process, to accumulate and to exchange information. Furthermore, in a knowledge management context, ICT can support transformation within and between tacit and explicit knowledge. Successful knowledge management initiatives could transform the small management capacity into a sustainable higher performance [10].
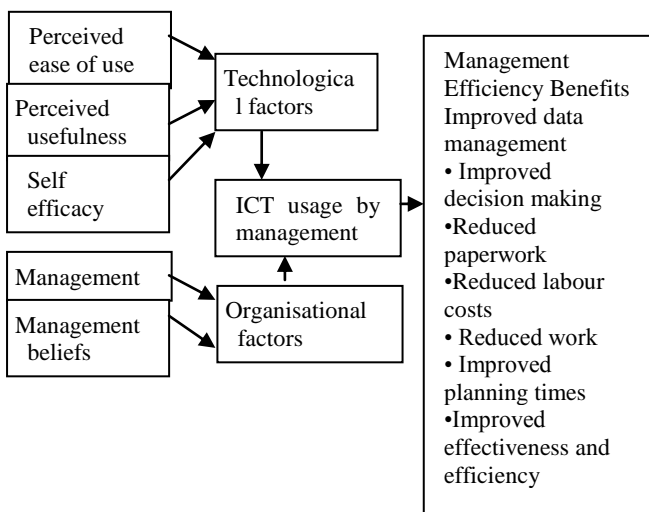


**Fig 2: Operational Benefits of ICT Adoption and Usage by the Management**

The above model shows the relationship between the independent variables and the dependent variables. The perceived ease of use, perceived usefulness and self efficacy of ICT relate to technological factors while management and management beliefs relate to organisational factors. These factors when put in place determine the ICT usage by management which in turn leads to benefits of using ICT.

## THE BENEFITS OF ICT IN SCHOOLS

[11] pointed out that recently developed Intelligent Computer-Assisted Instruction (ICAI) programmes are able to generate and solve problems, diagnose students' misconceptions, select appropriate teaching strategies and carry on dialogue with students based on in-depth studies by researchers on how people think, learn and solve problems. However as, [11] notes these advantages are out of reach of most developing countries, where power and telecommunication facilities are poor, where resources and well trained teachers are scarce and where television and other forms of distance education costs are unbearable [7]. This view may be applicable to Kenya where schools ICT potential has not yet been fully exploited. There are three ways in which ICT can support education in schools. These are;

1. Supporting education in schools, providing non-formal education for out-of-school children and adults,
2. Supporting pre-service distance education of teachers and
3. Supporting in-service professional development, and enhancing the management of schools [2].

## CHALLENGES OF EFFECTIVE ADOPTION OF ICT IN SECONDARY SCHOOLS:

Several factors were found to affect adoption and use of ICT in the selected schools [2]. The ICT skills of the school manager were seen as a major success factor. In cases where the Manager had ICT skills or had a keen interest, a trickledown effect was observed. This was evident at Wareng High School where the School Principal has a Higher National Diploma in IT and at St Cathrine Girls High School where the school principal has a lot of interest in e-learning and has even attended the past three international conferences organized by e-learning Africa. Providing all learners with computer literacy is seen as another success. Although the ratio of computers to learners is quite low in most schools, an attempt has been made to schedule all classes in the school for computer lessons in the teaching timetable. Learners have been allocated between 40 minutes and 100 minutes a week for computer lessons [2]. There are also several factors that hinder the implementation of ICT integration and use in schools and these include: limited time to prepare ICT teaching materials due to the loaded curriculum. Converting manual teaching notes to soft copies requires both time and skill. Teachers are also not motivated by this, being an added load to the curriculum with no additional remuneration or reward. The number of computers is a major barrier in that learners have to share the few that are available when they have computer classes. The inability to acquire more

computers or update those which are obsolete due to lack of finances and the fast changing information technology is another major hindrance [2].

**Methodology:** Research methodology is the strategy, plan of action, process or design lying behind the choice and use of particular methods and linking the choice and use of particular methods to the desired outcomes [11]. A survey research methodology was employed in this study. Data was collected from a target population of 300 who included teachers and head teachers of secondary schools in Wareng District. A total of fourty two respondents were sampled for the study. Questionnaires were used as the main instruments of data collection where data was analyzed qualitatively and quantitatively using descriptive and inferential statistics.

## STUDY FINDINGS

**Characteristics of the respondents:** The study involved a survey of secondary schools within Wareng District which was previously Kesses Zone located in Uasin Gishu County of the Rift Valley Province of Kenya. The participants of the study included both male 30 (71.4%) and female 12 (28.6%) as respondents. Most of the respondents were degree holders who included; school principals and their deputies, Heads of Departments (HODs) and Boards of Governors (BOG) members. With regard to their academic credentials, all of them were literate and suitably qualified for their roles in school management. A total of 3(50%) day and 3(50%) boarding secondary schools were sampled for the study.

**Adoption and Use of ICT in Performing Management Functions:** The study also sought to find out from the respondents if there was any significant difference in ICT adoption and use when performing management functions between day and boarding schools. The findings indicated that most of the day schools used both traditional and modern ICT related aspects in performing management functions but a slight difference was observed where more boarding schools seemed to adopt and use modern ICT as compared to day secondary schools as shown in table 1.

**Table 1.Type of school and ICT classification Cross tabulation**

|  |  | ICT classification | | | Total |
|---|---|---|---|---|---|
|  |  | Traditional | Modern | Both |  |
| Type of | Day | 10 | 3 | 7 | 20 |
| school | Boarding | 3 | 10 | 9 | 22 |
| **Total** |  | **13** | **13** | **16** | **42** |

The results imply that more boarding secondary schools had embraced modern ICT in the performance of management functions as compared to day schools. The study also established that the level of adoption and use of ICT in Wareng District schools was limited in as far as performing management functions was concerned, as compared to performing other functions such as typing examinations and other secretarial duties.

**Uses of ICT in Secondary Schools:** Respondents were asked to indicate ways in which ICT was applied in the performance of management functions in their respective schools. Most 26(61.9%) of the respondents indicated that they used ICT in storage of school records 20 (47.62%) on

timetabling, 20(47.6%) on communication, 18 (42.9%) on secretarial duties as shown in table 2.

**Table 2 Uses of ICT In schools**

| TASKS/ICT APPLICATION | Freq | % |
|---|---|---|
| Storage of all records | 26 | 61.9 |
| Timetabling | 20 | 47.62 |
| Communication | 20 | 47.6 |
|  |  |  |
| Secretarial Work e.g. typing | 18 | 42.9 |
| Academic Results analysis | 13 | 31.0 |
| Financial accounting Analysis | 12 | 28.6 |
| Internet | 11 | 26.2 |
| PowerPoint presentation in meetings | 1 | 2.4 |

The findings show that ICT is mostly used for record storage purposes, timetabling, communication and secretarial work E.G typing examinations and staff meeting minutes in that order. Analysis of both academic results and financial accounting, use of internet and power point presentations recorded very low ratings. The level of ICT use was scored on a scale of 12 to 60 with those closer to 12 on the scale performing better in ICT adoption and use. It was observed that on the whole, the adoption and use of ICT in Wareng schools was average with a mean of 37.214 and a standard deviation of 8.14 with the respondents score ranging from 22 to 52. When the ICT usage score was grouped and categorized into low, average and high, it was observed that ICT adoption and use in schools in Wareng District was average as recorded in figure 2.

**Figure 2 Level of ICT usage in Managing schools in Wareng District**
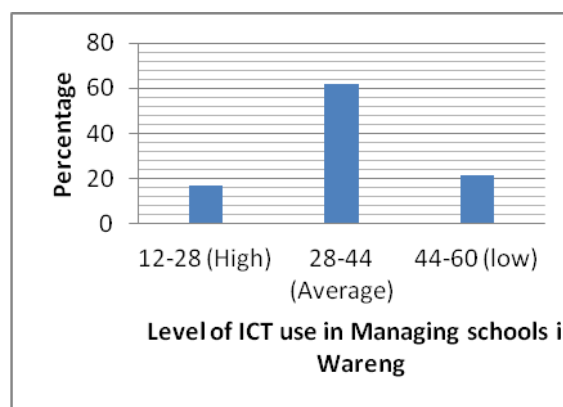


This level of use indicates that although it is still on average, there is recognition that it is quite necessary and the schools management are willing and ready to adopt ICT if and when facilitated. The study also established that there was a difference in ICT adoption and use among day and boarding secondary schools within Wareng District. Results showed that boarding schools had adopted and used ICT for a longer period than day schools. Boarding schools had also better facilities with modern ICT as compared to day schools. This

is mainly because, most of the boarding schools are well established with good infrastructural facilities and have been in existence for a longer period as compared to day schools. This brings out the glaring disparities between day and boarding schools and therefore there is need to improve the adoption and use of ICT and provision of other necessary facilities in day secondary schools in Wareng District.

**Benefits of Using ICT in Performing Management Functions:** The respondents were asked to give their opinions regarding benefits of using ICT in performing management functions. The results indicate that ICT adoption and use had potential benefits in performing management functions in secondary schools. Fourty or 95.2% of the respondents indicated that ICT improves efficiency and effectiveness, 38 or 90.5 indicated that it improves accountability 90.5%, 37 or 88.1% said that it improves communication while 83.3% said that it improves data management. Other benefits that emanated from the study findings included the reduction of labour costs, make work easier and improve decision making as illustrated in table 3.

**Table 3 Benefits of Using ICT in Performing Management Functions**

| Benefits | Freq | % |
|---|---|---|
| Improve effectiveness and efficiency | 40 | 95.2 |
| Improving accountability | 38 | 90.5 |
| Improving communication | 37 | 88.1 |
| Improving data management | 35 | 83.3 |
| Reducing labour costs | 33 | 78.75 |
| Makes work easier | 30 | 71.4 |
| Improving decision making | 25 | 59.5 |

These results show that most of the respondents acknowledge the importance of using ICT in performing management functions in secondary schools. The results indicate that the benefits of using ICT in schools are undisputed. There was also general agreement that ICT has positive effect in school management as most respondents agreed with the statement that ICT; makes teaching more effective, makes lessons plans richer, helps in organizing professional tasks, helps in meeting varying needs of students and helps in smooth running of school operations.

**Effects of Adopting and Using ICT in Secondary Schools:** Results showed that most 71.4% of respondents agreed that ICT makes teaching more effective by making lesson plans richer, 64.3% of respondents also agreed with the statement that ICT helps in organising professional tasks with only 14.3% of respondents being undecided, 35.7% agreed that ICT helps to meet varying needs of students of which 26.2% disagreed with the statement, a significant 83.3% of respondents also agreed with the statement that ICT helps in smooth running of school operations. A test of the relationship between ICT use and the effect of ICT on school management shows a positive linear relationship ($r=0.324$, $R^2=0.105$, $\alpha=9.459$ and $\beta=0.324$) with a linear regression model:
Effect of ICT use in management = 9.459 + 0.324 level of ICT use.

This relationship is however weak since only 10.5% of the change in effects can be attributed to a unit change in ICT use. This means that a lot more has to be done in the adoption and use of ICT in carrying out managerial functions so that the effects and benefits are more pronounced.

In summary, most of the respondents agreed with the statement provided therein regarding the effects of adoption of ICT in secondary schools. The implication is that there was a general feeling among the respondents that ICT had a positive effect on school performance when adopted and used by the school management.

**Table 4 Challenges of ICT use in Secondary Schools**

| Challenges | Frequency | % |
|---|---|---|
| Limited knowledge on how to make full use of ICT | 40 | 95.2 |
| Lack of financial support | 40 | 95.2 |
| Limited understanding on integrating ICT into management functions | 39 | 92.9 |
| Lack of technical support | 37 | 88.1 |
| Software unavailability | 30 | 71.4 |
| Lack of interest in using ICT | 23 | 54.8 |
| lack of time | 20 | 47.6 |
| Lack of computers | 18 | 42.9 |
| Limited personnel | 15 | 35.7 |
| Lack of electricity | 12 | 28.6 |
| Poor infrastructure | 10 | 23.8 |
| unregulated access to information on the internet | 2 | 4.8 |

**Conclusions and way Forward:** The adoption and use of ICT in education has improved a great deal but the real impact is yet to be fully realized as in other fields. Education is a very socially oriented activity and quality education has traditionally been associated with strong teachers having high degrees of personal contact with learners, but for school performance to improve there is need to have an effective management that allows smooth and responsible running of schools.

The paper concludes though most of the schools in Wareng District have computers, the computers are rarely used to perform management functions. The study also established that schools within Wareng District have not fully embraced ICT in performing their management functions. The level of adoption and use of ICT in the performance of management functions is higher in boarding schools as compared to day schools.

The managers of schools do recognize that there are several benefits related to the adoption and use of ICT in their schools. However, those in management had not fully realised these benefits since the level of adoption and use of ICT at the management level is still low.

The study also established that there are several challenges that face the schools management in the use of ICT in school management, with the key challenge being lack of technical skills to integrate ICT in management. These challenges may be the reason why most schools in Wareng District have not

fully embraced ICT adoption and use in school management. They include: lack of technical support, lack of financial support, inadequate facilities, lack of ICT related software and hardware to perform the management functions and limited knowledge on how to integrate ICT into management functions. This has resulted to most schools sticking to traditional ways of performing management tasks which has currently been improved by technological innovations.

Finally, there is need for the school management and all stakeholders in the education sector to ensure that ICT is fully adopted and used in management of public secondary schools in order for the schools to enjoy the benefits associated to ICT use in schools. Therefore, school managers should be trained to ensure that they have the right skills to perform the management functions using ICT.

**Recommendations:** Following the study findings, it is clear that ICT is important and beneficial in performing management functions in secondary schools. In order to improve performance, there is need for the school management to adopt and use new technologies at all levels of their operations. To do this, the paper recommends the following:-

1. Training of school managers on the use of computers – the ministry of education in conjunction with other stakeholders should organize in-service course for all teacher/managers in secondary schools and especially those in management positions.
2. Provision of electricity to schools – through rural electrification programme the government should prioritize school electrification programmes so that all schools can enjoy the benefits of ICT.
3. The Kenyan government should post computer technicians to schools- the government should post computer technicians to all schools to aid in the maintenance of ICT appliances.
4. Provision of ICT appliances to schools – the government should establish ways of providing computers to schools and their application software's.

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