

Education District Inventory Management System

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Abstract

The purpose of this study was to investigate the challenges faced during communication and resource allocation in schools within Chilanga District. The study took place in 30 schools and the total number of teachers was 90. The teachers included Head teachers, Deputy Heads and Heads of Departments. The study used simple random sampling. The study used Descriptive survey design and questionnaires with structured and open-ended questions, which he administered to respondents. Qualitative and quantitative data was obtained and frequencies, charts and pie charts were used to interpret data in Microsoft excel and Statistical Package for Social Sciences (SPSS Version 16.0). From the findings, the study revealed that some of the challenges faced in the district included the use of letters that was untimely and gave challenges in storage and retrieval after some time. It takes time for the district to update their database hence challenges during resource allocation as they could base on outdated information. The researcher developed a web-based system called Education District Inventory Management System to help the district with allocation of resources, storage and sending information, planning and budgeting. The significance of this study therefore provide ways of solving the challenges faced during the distribution of resources in schools, communication, provision of quality education through easier preparations and delivery of the curriculum in use.

Keywords: ICT; Communication; DEBS Office; Education; Distribution of Resources; District Inventory; Learners and Teachers.

1. Introduction

Information Communications Technology (ICT) permeates the business environment, it underpins the success of modern corporations, and it provides governments with an efficient infrastructure.

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At the same time, ICT adds value to the processes of learning, and in the organization and management of learning institutions. The Internet is a driving force for much development and innovation in both developed and developing countries. Countries must be able to benefit from technological developments. Information and Communication Technology is important because it helps in communication through mails, websites and other medium of communication, it also help in critical thinking, decision making and planning as it stores information, analyses data, process data and output information. School administration plays an important role in the work about of the institution, they are education leaders keeping check on the wellbeing of every function-taking place in the school therefore they need adequate information [1].

ICTs is used as a tool in provision of immediate and up to date resources using one or more media to a large number of educators and learners in an easy and cheap way. Changes made to resources are immediately available to educators and students without incurring major distribution costs. New technologies can also help in improving the quality of administrative activities and processes including human resource management, student registration and monitoring of students enrolment and achievement [2].

The gap between the rich and poor nations and between certain groups within a country is a result of several factors. One of the factors is inequitable access to resources among the citizenry and lack of technology to exploit the vast natural resources available in most countries. One fundamental difference between the developed and the developing countries is that the former are also rich in information and has a well-informed citizenry which is able to adapt quickly to changing social and economic environments, hence utilizing opportunities to overcome development challenges such as poverty. In this regard, information is a commodity that has potential to make significant changes in many aspects of our social and economic development. ICTs can help to bridge the digital divides within the context of globalization. The digital divide presents barrier by denying an opportunity for the people to take best practices and make them applicable in the possible ways. Zambia has the opportunity to make a difference by adopting and using ICT as a tool available to reduce the development divide thereby increasing the chances of improving the quality of life of the citizens. ICT is an enabler to build an information-centered society where everyone can create, access, utilize and share information and knowledge leading to greater productivity, greater competitiveness and sustainable economic growth, a precondition for poverty reduction. ICTs is also an effective tool in enhancing good governance. A number of research institutions have acquired human capacity to work with ICT tools such as computers. However, the level of use of ICTs and the outcome of such activities needs to improve. Holistic approaches to education with the support of ICTs need to be in place [3:1-3]. The spokesperson for ministry of education contended that the ministry was aware of the challenges faced during the implementation if ICT in rural areas and vowed that government will electrify all schools in rural areas so that teachers and learners can use computers because they will have been connected to the national electricity grid [4].

This Digital Strategy for Schools sets out the vision of the Department of Education and Skills to embed Information and Communications Technologies (ICT) in teaching, learning and assessment in Irish primary and post-primary schools in the period 2015-2020. The Programme for Government (2011-2016) commits to integrating ICT more deeply into the education system. The Strategy maps out how to realize this commitment and the ways of using ICT in schools to broaden and enhance teaching, learning, and assessment practices. This

Strategy endorses the definition of ICT as “a diverse set of technological tools and resources used to communicate, and to create, disseminate, store, and manage information”.

It is important that all sectors of the education understand the benefits of investing in ICT and the infrastructure that is required for introducing ICT. There is a need for government to collaborate with private sector for resource mobilization to fund the use of ICT in education. This calls for policies that promote broad access to skills and competencies to learn ICT, which requires provision of broad, based formal education, establishing incentives for firms and individuals to engage in continuous training. [5] Stipulates that schools need to have access to a wide range of relevant, high-quality digital content, which serves to support learners at all stages of our education system. There is need for schools to have enough computers and access to internet for easier integration of ICT in education.

Information and Communication Technology can contribute to universal access to education, equity in education, delivery of quality learning and teaching materials, educational governance and administration. UNESCO takes a holistic and comprehensive approach to promote ICT in education. The organization's intersectional platform in organizations focuses on these issues through the joint work of its three sector: Communication and Information, Education and Science [6]. According to [7] The Ministry of Education recognizes that the following principles are critical to the success of the integration of ICTs in the Education System:

- Accessibility to and utilization of information and knowledge are fundamental to the development of the Country's citizenry;
- In light of the growing impact of advanced Information and Communication Technologies (ICTs) on the economy, each student requires access to up-to date computer-based tools to make a valid contribution to society.
- Knowledge creation and development and the assimilation and utilization of indigenous knowledge are also essential to the development of the Country's citizenry.
- The availability and creative use of authoring packages by teachers in the development of their own instructional material can have positive impact on the teaching-learning process;

ICTs needs exploration using innovative methods in order to allow students greater control and flexibility over their learning and thus develop skills at their own level and speed. Consequently, the potential of all individuals (including the mentally and physically challenged) requires enhancement by the use of computer-based resources, including multimedia packages and other electronic learning tools.

The strategic goal of integration initiatives must be the increased production and creation of knowledge and technologies, in particular software solutions and information systems that are relevant and instrumental in the development process of all sectors of the society.

Various competencies, hence, must be developed through the education system for ICT integration to be successful [8].

The problem of this study is that there is a challenge in communication and resource allocation between the District Education Board and Schools within the District more especially schools in rural areas.

The researcher developed the Education District Inventory (EDI) to narrow the gap in communication between the District Educational Board Office and schools within the district. The EDI has two administrators namely the District Education Board Secretary (DEBS) who is the general administrator and the District Education Standard Officer (DESO). Administrators are able to access the link on the side bar for manage resources which contains the manage teachers and manage resources such as devices, appliances and books. The other link on the side bar is the planning, which consist of resource distribution. Teachers will be able to furnish the district with up to date information by login to the site and send the information in the comfort of their workplaces. The planning link also contains budgeting. The last link on the side bar is the system setting which contains the link where information about administrators would be changed if need arises. The link also contains the control panel. The system has the link to export data to excel for analysis.

2. Objectives of the study

- i. To investigate possible ways of reducing challenges faced during communication between the District office and the schools.
- ii. To investigate ways of reducing the challenges faced during resource allocations in the district.
- iii. To find out ways of reducing high teacher to pupil ratio in schools.

3. Limitation of the Study

The study did not cover all schools in the district. However, the information gathered, generalizes to all the schools within the district.

4. Materials and Methods

This heading covers location of the study, research design, target population, sample and sampling procedures, data collection procedures and data analysis

4.1 Location

The study took place in Chilanga district. It is a newly introduced district in Lusaka province. Chilanga district is found on Latitude 15° 23' 16.0'' S and Longitude 28° 17' 40.9'' E south of Lusaka the capital city of Zambia.

4.2 Research Design

According to [9] research design is the set of methods and procedures for arrangement of data correction and analysis in the way aimed at minimizing effort and expenditure. Reference [10] Notes that the research design employ depends on what the researcher is trying to investigate. This study used descriptive surveys as it

involved gathering data that describes events. This method was preferred because information was readily obtainable from subjects in their natural environment, concerning their attitudes or beliefs on the study.

4.3 Target Population

The target population of the study consisted of 90 teachers. Teachers were targets because they are the major agents of communication and resource delivery, so they could be in the position to give solutions to challenges encountered during communication and resource delivery.

4.4 Sample and Design

The researcher used simple random sampling by writing the names of the schools to be included in the sample, folded the papers, put them into a bottle, shook it and picked the papers at random while shaking up to the desired number of 30 schools. The researcher sampled 3 teachers from each school, one Head teacher, one Deputy head and one Head of department. The total number was 90 teachers.

4.5 Data Collection Techniques

The instruments, which the researcher used to collect data, were questionnaires with both open ended and structured questions. The researcher used questionnaires because they were easy to administer, they were free from bias of the interviewer, answers are in respondent's own words, respondents had enough time to give thought answers and results could be more dependable and reliable.

4.6 Piloting of research instruments

The researcher conducted a pilot study to determine the validity and reliability of the instruments. In piloting, three schools were selected which were not involved in the main study. The researcher administered the research questionnaires to these respondents randomly. The pilot study helped to improve face validity and content of the instruments.

4.7 Validity

The researcher used content validity to assess whether the content of the questionnaire measured the intended measure. The researcher checked if there were confusing words in the questionnaire so that he can improve content validity.

4.8 Reliability

Reliability is the measure of the degree at which research instruments would yield consistent data after administering them repeatedly. The researcher used a test retest method to evaluate the degree of getting hold of similar results after repeatedly administering of the research instrument. The researcher sampled six teachers and administered the questionnaires, which they filled up and re-administered the same questionnaires after three weeks. When crosschecking results, they reviewed that the difference in response, by the respondents was

minimal indicating high reliability.

4.9 Data collection procedure

The researcher first got permission from the DEBS office to conduct the research and then he administered questionnaires to teachers in selected schools.

4.10 Data analysis

The researcher used descriptive statistics in the analysis of both quantitative and qualitative data. The researcher analyzed data by editing, coding and tabulation according to the research questions. [5] Points out that analysis means ordering, categorizing, manipulating and summarizing of data to obtain answers to research questions. The data was entered into the computer and analyzed with the aid of Microsoft excel and Statistical Package for Social Sciences (SPSS Version 16.0).

5. Results

Simple pie charts, bar graphs and frequency distribution tables were useful in presenting data were interpretations and conclusions were drawn.

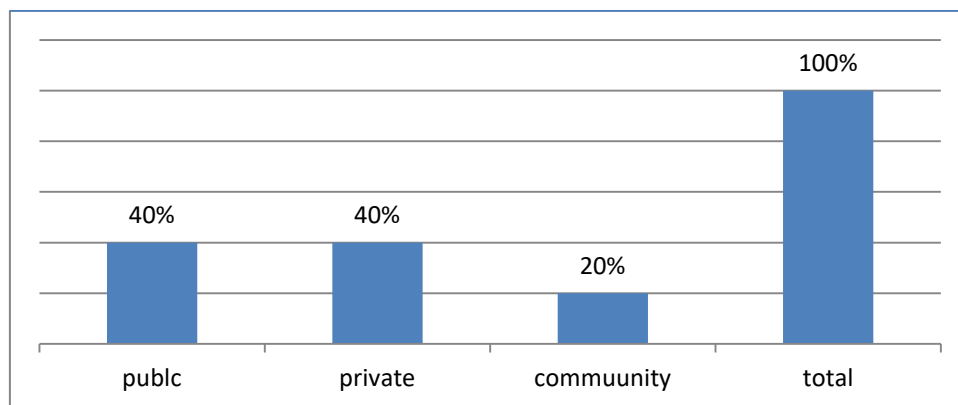


Figure 1: First bar chart.

Source: Field Data 2017

The information in figure 1 above shows that from the schools where the research was conducted 40% of the schools were Public Schools, the other 40% were Private Schools and 20% were community Schools. On average the government caters for 50% of learners, Private schools cater for 40% of learners and Community Schools cater for 10% of learners in Chilanga District. 90 teachers managed to participate fully during the study, 30 Head teachers, 30 Deputy Head teachers and 30 Heads of Departments.

5.1 Communication

SCALE	FREQUENCY	PERCENTAGE
Many	57	63.3
Few	33	36.7
None	0	0

Figure 2: First table

Source: Field Data 2017

Figure 2 above, reviews that 57% of the respondents explained that there were many challenges faced because of ineffective communication between schools and the DEBS Office. The major challenge which was brought forward was the mode of communication in use which is the use of letters which tend to be untimely delivered and a bit cumbersome to store and retrieve information because as the letters pile it becomes difficult to locate them when need arises. The other challenge was the long process in the system to update the database in the district as a result certain decisions could have been inappropriate, due to outdated information, which causes challenges during allocation of the resources that includes books, teachers, appliances, devices and infrastructure. 36.7% of the respondents contended that few challenges were faced in communication between the DEBS office and the schools as the office could use text messages at times which could save on time though certain respondents stated that they could not see messages on time and such messages could not contain information which was substantial and were less interactive. None of the respondents reviewed that there were not facing challenges in communication.

5.2 Distribution of Resources

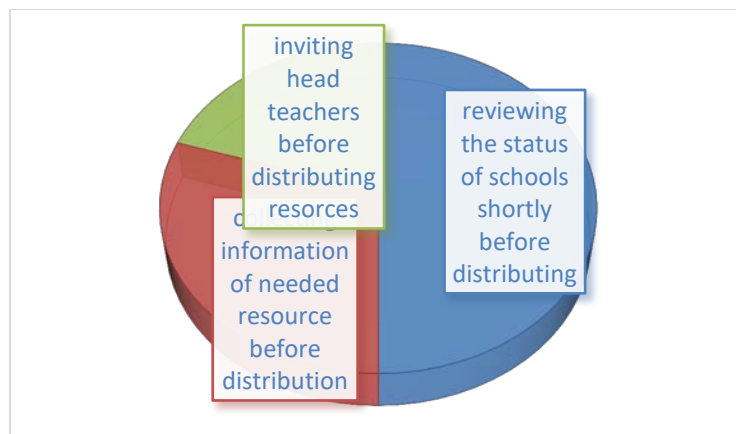


Figure 3: First pie chart

Source Field Data 2017

Figure 3 above reviews that 58.3% of teachers in government schools feel that as the government send grants to schools the DEBS office should review the status of the school unlike basing their decision on the school census as situations changes from time to time. Here the major problem is that sometimes schools with more learners

receive resources that are equal to schools with few learners, thereby disadvantaging the schools with more learners and possibly reducing on the rate of performance and lesson delivery by teachers with more learners. 25% of the teachers in public schools explained that there was need for the DEBS office to have a waiting list at hand so that when resources are available the right decision would be made based on the latest information on the waiting list of schools with critical shortage of resources. 16.7% of the public teachers suggested that there was need to invite head teachers for planning prior to the distribution of the resource.

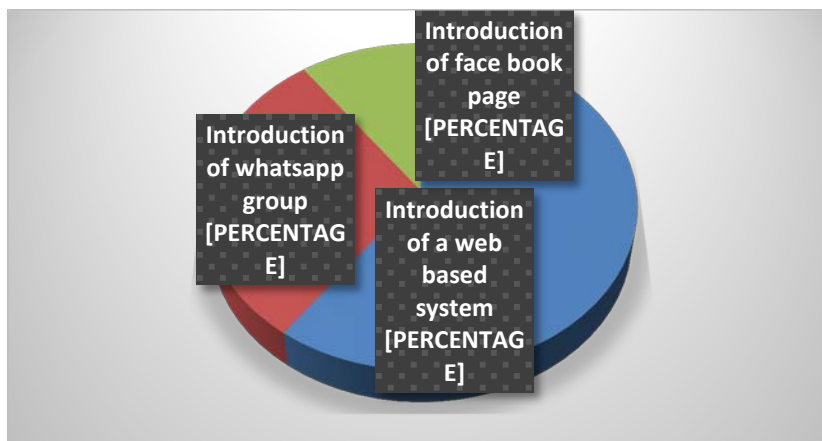


Figure 4: Second pie chart

Source Field Data 2017

Figure 4 depicts that 60% of the teachers in private schools feel that there is need to develop a proto type system to improve on delivery of resources. The government does not fund private schools but they receive resources such as timetables for exams, notice for workshops, seminar and Head teachers' assembly. 30% of the private school teachers pointed out that there was need to introduce a WhatsApp group for sharing information pertaining resources available for distribution while 10% settled for a face book page.

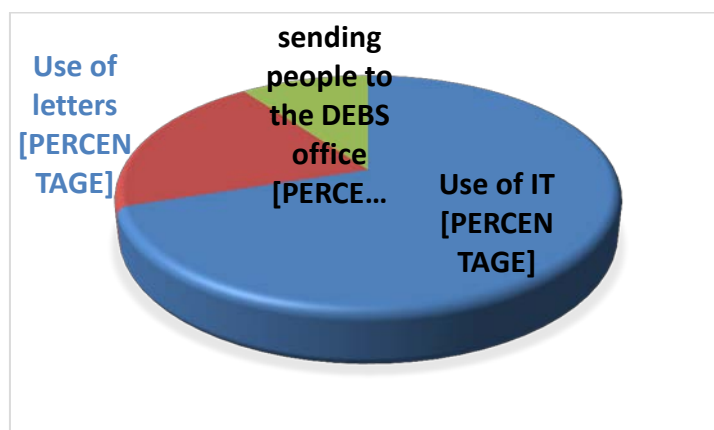


Figure 5: Third pie chart

Source Field Data 2017

From figure 5 above, 70% of teachers from Community school responded that there was need to use IT to distribute resources by assigning them electronically to the schools and balance them before the physical hand over of resources. 20% of the respondents were of the view that letters should be administered to schools informing them about the resources allocated to their schools before the official hand over of resources. 10% of the respondents pointed out that teachers should go to the DEBS office before prior information to check on the resources allocated to their schools.

5.3 Human Resource

SCALE	FREQUENCY	PERCENTAGE
Deploy more teacher of ICT	47	52.2
Sending more teachers for in service training in ICT.	25	27.8
Split classes	18	20
Total	90	100

Figure 6: Second table

Source Field Data 2017

Figure 6 above contends that 52.2% percent of the respondent articulated that the high teacher to pupil ratio could be lessen by deploying more teachers as they graduate. 27.8% of the respondents contended that high teacher to pupil ratio could be lessen by encouraging more teachers to go for in service training as teachers of ICT.

20% of the respondents were of the idea that increasing the number of streams, by splitting the classes would reduce the high teacher to pupil ratio. The high numbers of learners make it difficult for learners to understand and few computers at their disposal that are meant for them to practice what they learn and possibly acquire basic computer skills could not accommodate huge numbers.

6. Discussion

The findings reviewed that there were challenges in communication between the DEBS office and the schools, the researcher developed the Education District Inventory to minimize on challenges of effective communication, as it is interactive, cheap to use, user friendly and efficient. The system has the provision for teachers to access information from the DEBS office and send the information to the DEBS office for quick and easier update of information.

Figure 7 above depict the Education District Inventory (EDI) Management System, users are supposed to click on login at the button below or on the top right corner to be taken to the next page shown in the figure below.

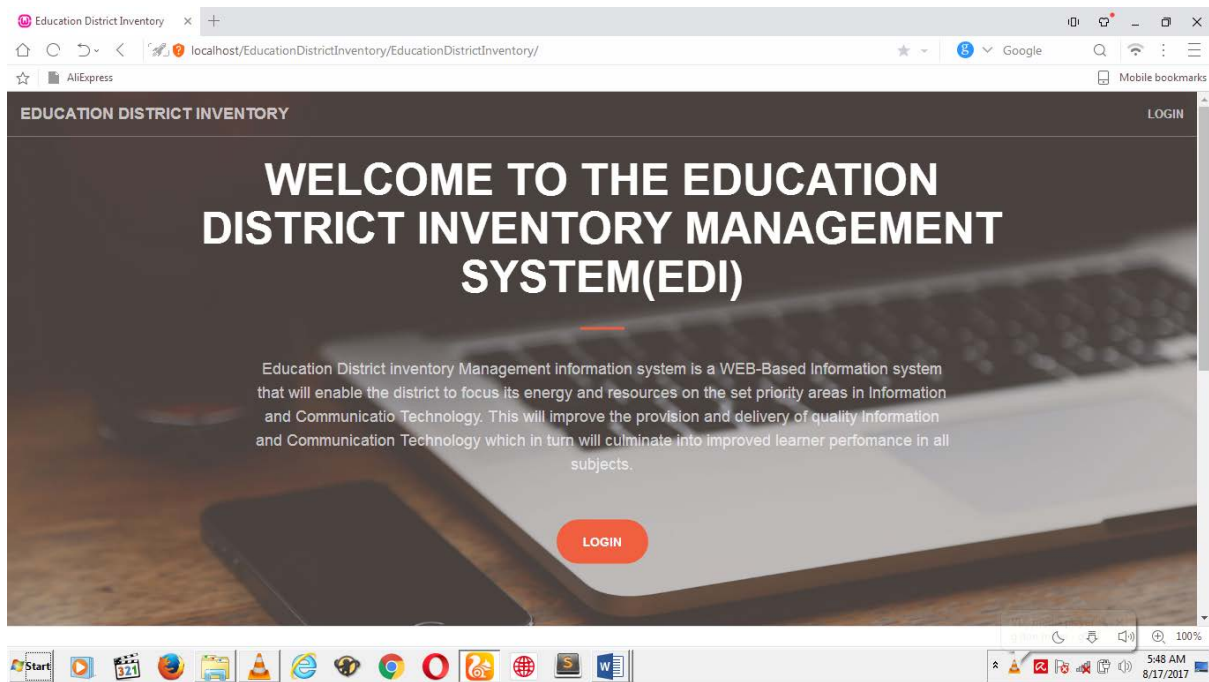


Figure 7: Login page

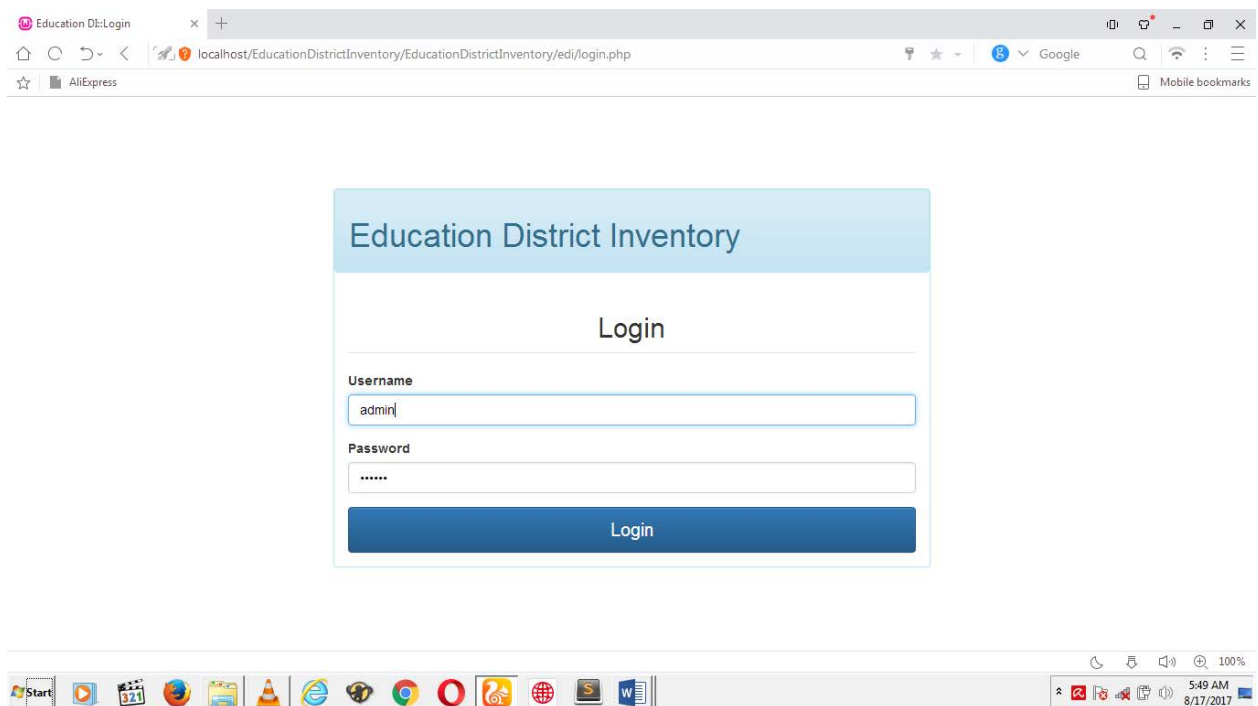


Figure 8: Login page

Figure 8 above shows the page where users can enter their user names and password to login the system.

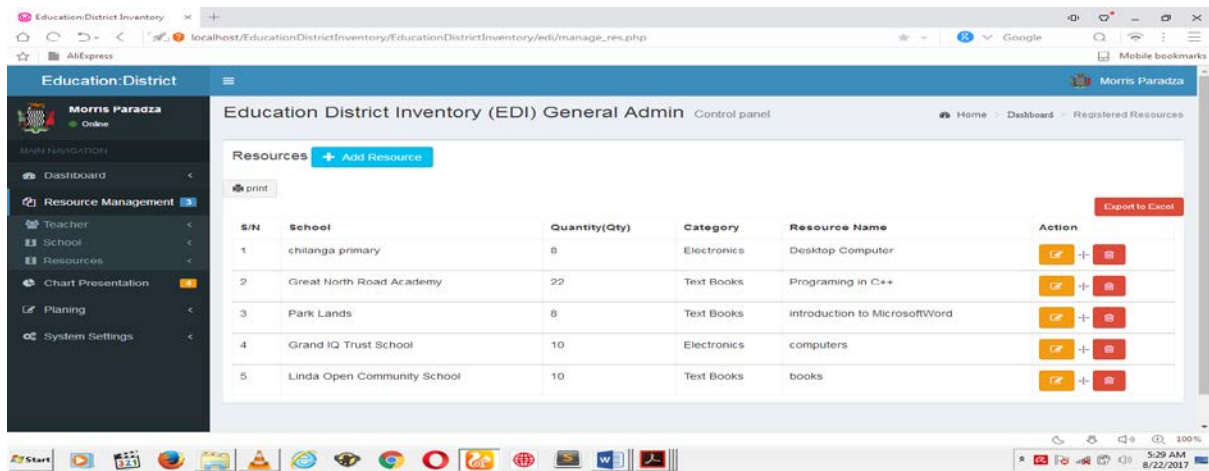


Figure 9: Resource page

The EDI has the resource page shown in figure 9 to minimize on challenges faced during resource allocation. The add resource tab on top with a blue background help administrators to allocate resources to specific schools within the district. The print link below the add resource tab enable administrators to print out hard copies for back up and assistance to schools which may not be able to access the information online. The table on the workspace shows the name of schools, quantity of resources, category of resources and the resource name. There is the action to delete or edit the information in case of any possible changes or mistake when entering the information.

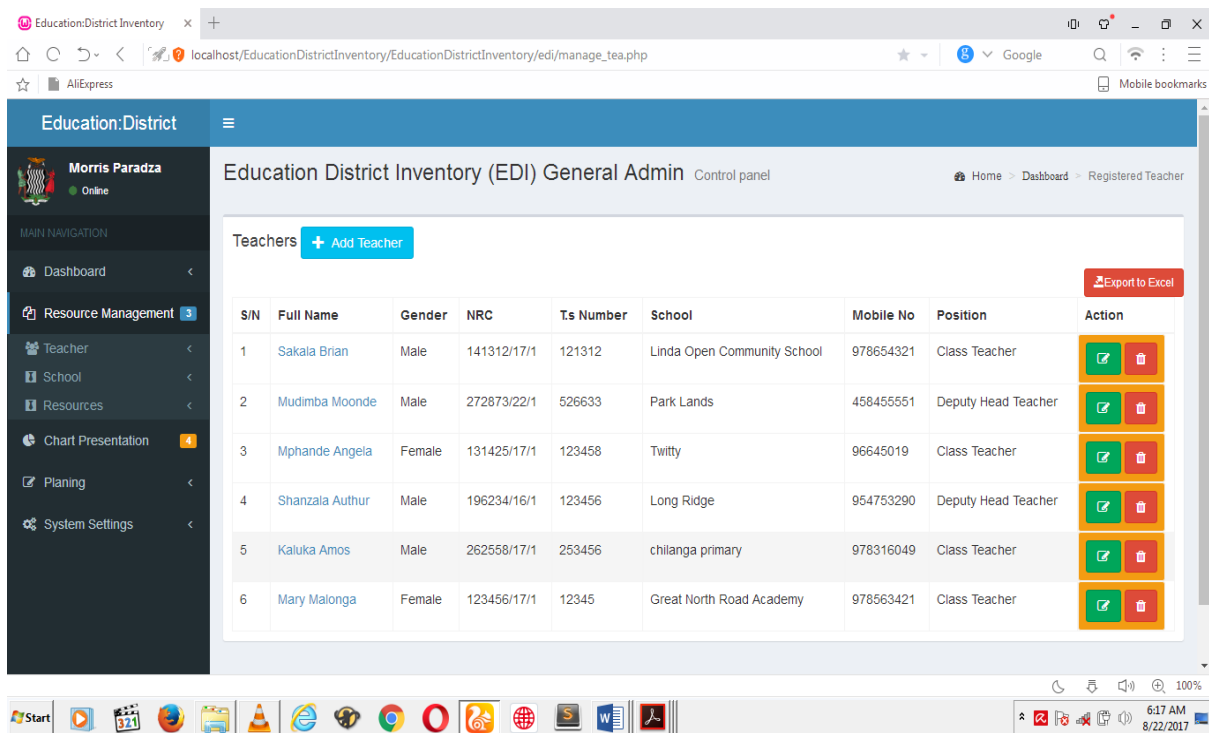


Figure 10: Teachers page

The teachers' page in figure 10 shown above helps administrators to allocate teachers according to information

in the database.

The export to excel link on top right corner with a red back ground assist administrators to export information to excel for analysis which could help during planning and decision making. The table on the workspace provides details of teachers and names of schools where they belong. The action for deleting or editing information could be useful in case the teacher upgraded his or her qualification, transferred, promoted, retire, dies or any other unforeseen circumstance. The EDI provides a link that allows teachers to apply online and the information about applicants is keep for use in case need for deployment or replacements arise. The manage teachers link gives the DEBS full control of the information for teachers. Here he is able to analyze schools with more teachers as compared to classrooms, schools with less teachers as compared to classrooms and this information helps in decision making such as transferring teachers, deploying more teachers or replacing teachers to reduce the high teacher to pupil ratio.

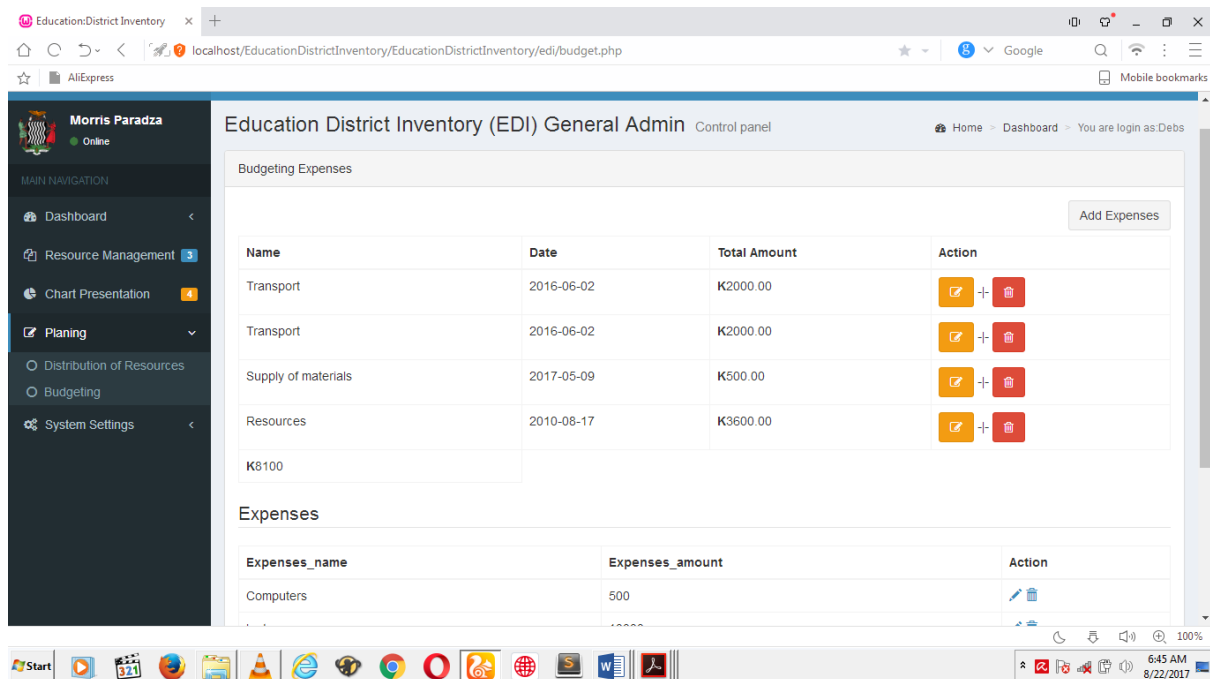


Figure 11: Budgeting

Figure 11 above helps in budgeting as it has a functionality to add the figures automatically as the administrator enters them in the system. It adds the figures and gives out the totals. It is also able to give out the difference in an event where certain figures reduces. The provisions for resource name, date for buying, total amount and action are available.

6.1 Online Candidate Registration

The examinations council of Zambia had challenges in communication during registration of candidates as the process involved collecting information from the schools to District offices from there information was taken to the examinations council of Zambia. The examinations council of Zambia developed the online candidate

registration system, which teachers and learners can access using this link www.systems.exams-council.org.zm. The system is user friendly and interactive to both teachers and learners as they send and receive information, it is fast and cheap, as it does not need teachers to travel to the DEBS office to submit or collect papers. The online candidate registration is a portal type web based system.

One of the basic and important skills teachers should have is the ability to communicate using digital tools. Teachers' skills should include email, instant messaging, mobile colleagues, and knowing how to organize and manage these tools in the classroom [11]. In addition, they should be able to collaborate online for learning in order to take advantage of the tools such as blogs, wikis, chats, audio and videoconferencing, to bring outside resources into the classroom and to encourage academic collaboration among students.

The New Partnership for Africa Development (NEPAD) initiative had two packages: These systems provided real time management data including teacher and student profiles. These packages would enable schools to report to the Regional Education Offices on any activity (in real time) who could in turn report to the headquarters [12].

The EDI can be devised by the current technology and add value to the current services which are integrated with ICT in education sector.

7. Conclusion

Respondents explained that there is a challenge in communication that is the backbone for effect delivery and learner performance in schools. If left unchecked it can reduce on learner performance. There is need to move from the use of hard paper to the use of paperless which is faster and does not need huge storage space. Respondents also contended that there was need to update information regularly as opposed to depend on school census which is carried out once a year as doing so could disadvantage learners and teachers during resource allocation. The distribution of resources should be close to the number of learners per school, these resources includes human resource, books, devices, appliances and infrastructure. Respondents recommended the use of face book page, WhatsApp, text messages and web-based portal systems to improve communication through the use technology and innovation.

8. Recommendations

There is need for teachers within the district to form face book page and WhatsApp group to increase on effective communication within the district. The government needs to speed up the process of rural electrification so that schools in rural areas have access to the national power grid for easy use of electronic devices in education.

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Appendix i

Acknowledgement

My heart felt gratitude goes to my supervisor Dr. Phiri for his support and guidance during the study. I further extended my acknowledgement to friends and families who participated in guiding me during this period.

Appendix ii

Budget

Table 1

Item	Cost Estimation (ZMK)
Questionnaire development	100.00
Transport for distribution of questionnaires	500.00
Transport for collection of questionnaires	500.00
Literature and Internet	2500.00
Food and refreshments during the study	1000.00
	1000.00
Total	5,600.00

Appendix iii

Researcher Questionnaire

RESEARCH QUESTIONNAIRE

Dear respondent,

I am an undergraduate student at ICU University pursuing a Bachelors of Education in Information and Communication Technology (ICT). As a partial fulfillment of the course, I am conducting a study on “Solutions to challenges faced in communication and resource allocation” in selected public schools, private schools and community schools in Chilanga District. For this reason, I would kindly appreciate if you would spare a few minutes of your time to fill in the questionnaire to the best of your knowledge.

Kindly respond to the questionnaire by ticking (✓) in the appropriate box or by filling the spaces provided. The information provided will be highly appreciated and treated with utmost confidentiality and only used for the sole purpose of this study, which is academic.

Thank you in advance.

SECTION A

PLEASE TICK (✓) IN THE APPROPRIATE BOX.

Type of School.

Public / Government School ☐

Private School ☐

Community School ☐

Designation:

Head teacher ☐

Deputy Head teacher ☐

Head of Department ☐

SECTION B

1. The following scale has been provided; kindly use it to fill the table below by ticking in the appropriate box using the Likert scale.

KEY:

i. Many

ii. Few

iii. None

Table 2

	Many	Few	None
How are the challenges of communication between the school and the district?			

2. If there are challenges faced during communication, what could be the possible solutions to the challenges?

3. Are there any challenges faced by the school during resource allocation? If yes what could be the possible solutions to the challenges faced?

4. How can we reduce the high teacher to pupil ratio in schools? Kindly tick the appropriately box.

By deploying more teachers especially for ICT ☐

By sending more teachers for in-service training ☐

By splitting classes into double streams ☐