

Education Management Information System and Tracking of Students' Records in Selected Public Secondary Schools in Turbo Sub-County, Kenya

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Abstract

This study sought to assess the role of the education management information system in the tracking of students' records in selected public secondary schools in Turbo sub-County, Kenya. In most secondary schools that are public in Kenya the tracking of students' records has been a challenge. EMIS has ensured that all the information about the school and the students is well recorded and kept so that it can be accessible to all at any given time. The study was guided by the research question: How does the Education Management Information System help in the tracking of students' records in selected secondary schools? The cross-sectional survey design was used in the study. The researcher used a simple random sampling technique and proportion stratified random sampling technique to select a total of 594 participants for the study. The data collection instruments were structured questionnaires and interview schedules. The subject matter experts reviewed face and content validity. The split-half reliability formula was used and a coefficient of 0.9 was obtained which suggests that the items had relatively high internal consistency. Descriptive statistics such as frequency distribution and percentages were used to summarize the data. The findings revealed that students were classified according to streams, admission numbers, performance in the Kenya Certificate of Primary Education and gender during the admission day. The students received end-of-term results in different ways which included manually, Zeraki, Short Message Services and WhatsApp. The findings revealed that EMIS was used to track records and send the academic results of the learners to their parents. It was therefore concluded that the schools use different ways to track and classify the students regarding their data in EMIS. The outcome of the examinations of the learners is given through the progress reports in EMIS. The study recommended that the principals should track and classify the new form one students according to the time and date that they report to the secondary schools. This will guarantee that the student's information is captured accordingly to enhance an accurate collection of the learners' details. This will in turn facilitate the easy identification of students who require special needs. The students' results should be electronically sent directly to their parents and guardians while the students given their feedback manually.

Keywords: Education Management Information System, Management, Records, Tracking.

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1. Introduction

Assessing the state of education in a country demands information about the inputs, resources, governance, operations and outcomes of its education system this is as stated by Abdul-Ahmid, (2014). The function of the Education Management Information System (EMIS) is to provide data in a well-structured environment to help in the use of the information obtained in the management and formulation of policies. In so doing this has enabled many secondary schools to plan well for the available resources. This is by making decisions that are relevant by using up-to-date data. This has facilitated proper management of the secondary schools in terms of handling the students' data on their enrollment by grade, age, gender, dropout rate, and completion rate. Secondary schools can also be properly managed while focusing on the school inventory data such as the physical facilities available for example the number of classrooms and the availability of the playground. If this information is readily available in EMIS the school managers can utilize the available resources adequately. The wide-scale implementation of EMIS started from the digital transformation trends that digitized almost all other sectors. Before its enactment, the schools used spreadsheets. The huge implementation of EMIS was consequently the accessibility of the internet (Fedena, 2020). It is a requirement from the Ministry of Education in Kenya that all secondary schools must have the operational EMIS functioning appropriately.

The Mongolia Report examined policy and the data gaps relating to EMIS and reviewed the extent to which data are analyzed and utilized for decision-making by the Ministry of Education, Culture, Science and Sports of Mongolia. The review concluded that EMIS was well managed to provide a comprehensive record of all educational institutions of communal and independent sectors, teaching staff and student data. Nevertheless, there exists room for improvement with regards to the utilization of the system for the intention of policy and planning. This was to guarantee that all the policies were implemented and that proper planning of the available resources was also considered. EMIS strives towards the achievement of Sustainable Development Goals of the

education agenda in the United Nations International Children's Emergency Fund, (UNICEF, 2020). The Economic Commission of West African States (ECOWAS) EMIS criteria and measures, together with Ghana's EMIS generates satisfactory statistics. The analysis was accomplished with firm participation by the federal EMIS body, together with elites from Gambia, Mali, Nigeria, the African Union, ECOWAS, and the Association for the Development of Education in Africa (ADEA). Generally, Ghana happens to be a clear illustration of education data generation and distribution. Ghana possesses an EMIS agenda for development and was answerable to the United Nations Educational Scientific and Cultural Organization Institute of Statistics among other zonal bodies (ADEA, 2017). By providing reliable and accurate data EMIS plays an essential duty in the decentralization process by ensuring that education provision becomes more efficient and responsive to the local requirements of the schools.

EMIS enhances the proper management of schools that is the education ministry has developed a homegrown solution, the National Education Management Information System (NEMIS) to provide quality, reliable and timely education statistics to enrich its planning processes. The hallmark characteristics of the structure include the issuance of the unique identification to schools, learners and all members of staff in the learning institutions. The unique identification number helps to track the students' records concerning their admission, class attendance and assessing their performance (MoE, 2017). These features are highly relevant in handling resources and allowing all efforts to be directed at achieving the attributes of instruction for continuous advancement. Through this system of education, sector players acknowledge the disposition of education regarding access, quality, equity, relevance, and efficiency together with institutional development. The use of NEMIS in Kenya has facilitated secondary schools to be organized in the information that they provide for their schools. In Turbo sub-county, Kenya NEMIS has helped in supervision and assessment through an enhanced quality and assurance framework. NEMIS has enabled schools to generate education statistics on enrolment and staff members to facilitate this role (MoE, 2017).

This study was anchored on the theory of diffusion of innovation by Everett Rogers (1962). The theory of diffusion of innovations seeks to explicate the manner and motive in which innovative thinking and practices are adopted with timelines potentially spread out over long periods. Rogers describes diffusion as how a transformation is conveyed through various means gradually amid the associates of a public system. The main constituents in the theory are creation, exchange of ideas, schedules and organization of the society. Diffusion of Innovation Theory refers to how and when individuals adopt new ideas. Rogers (2003), defines the adopter categories as the classifications of representatives of a social organization based on innovativeness. This classification includes innovators, early adopters, early majority, late majority and laggards. For Rogers, innovativeness facilitated the comprehension of the way the decisions are made. Therefore, the adopters were ranked according to their level of innovativeness. As per the innovators, this group of individuals sets the trends they are the pioneers. They may be researchers, thought leaders or successful early implementers with impressive results. The acceptance procedure starts with a handful population of idealistic and artistic pioneers. The early adopters may look to innovators for inspiration and see how these new ideas play out. They doubt what the innovators are capable of doing. However, considering the attainments of the innovators, Rogers asserts that the early adopters dare and subsequently they use their creativity to innovate.

The early majority are quite hesitant with the innovations and they are inclined to be more patient to see if the ideas are working out from the other group that they look up for. They ask a lot of questions for instance, did the early adopters prevail in their challenges during the invention period? Are there any lessons that they can utilize to lighten their ideas to be prosperous? Are the facts right that merits will result in benefits for this group? For the late majority, they delay until the modification has become established by the early majority. They must be persuaded for them to think otherwise. However when they are satisfied with the results of the early majority then they will gladly approve the ideas and join in. The laggards in this group may or may never take action. They will probably have the most resistance to an idea or action either because of disinterest or because of long-held and entrenched beliefs (Rogers, 2003). According to Rogers (2003), trialability is the degree to which an innovation may be experimented with on a limited basis. Trialability is positively correlated with the rate of adoption. The acceptance of a new idea depends on how often it is being used. A different form of the idea is possible when a test is done on the innovation. The potential adopter can alter the new idea. Therefore, the more the reinvention the more accelerated the approval of the new idea. The earlier adopters view trialability as more significant than late adopters. Therefore, the ability of the theory to be flexible for reinvention makes it more appropriate to be used in an educational situation. As defined by Rogers (2003), complexity is the extent to which a conception is somewhat hard to comprehend and utilize. The approval of an idea solely depends on its usability. This implies that if for example, a program is difficult to put into practice in an institution then its adoption and implementation is impossible. The theory by Rogers is the most suitable for scrutinizing the consent of new technology in an educational institution (Medlin, 2001). This is because through the theory EMIS is gaged on how it is being implemented in secondary schools and it helps to know the level of adoption in the schools if they are early adopters or late majority.

2. Statement of the Problem

The information on educational expenditures helps educational managers to establish equity and efficiency in resource allocation. The Ministry of Education, (2021a) states that it paid out Kenyan Shillings 1.8 billion for ghost students in secondary schools in the 2019/2020 financial year. EMIS has helped to purge ghost students and certified that the allocated resource is used for the intended purposes in all the secondary schools. Data gaps prevent countries from conducting data-driven decision-making in schooling guidelines. Crucial data is often not available and available data is often hard to use. If key details on handling EMIS adequately are not taken into consideration to ensure the proper use of EMIS in tracking students' records in selected secondary schools, then a lot of information about the students' may be lost. The schools' data which is the students' records, for example, their details such as admission, performance and class attendance may not be properly managed thus leading to poor planning and managing of the schools. This may also hinder the government from knowing exactly if the resources allocated are sufficient to facilitate good management of schools since there is no accountability with the way the finances are being utilized to students' population and records. This study, therefore, assessed the role of EMIS in tracking students' records in selected secondary schools in Turbo sub-county, Kenya.

3. Research Question

The study was guided by the following research question: How does EMIS help in the tracking of students' records in selected secondary schools in Turbo Sub-County, Kenya?

4. Purpose of the study

The main purpose of this study is to find out how EMIS helps in the tracking of the students' records.

5. Education Management Information System and the tracking of students' records in secondary schools

Technology plays a role in ensuring that secondary schools keep their data well. Through EMIS secondary schools have tracked the students' records and provided detailed, accurate information about their students. In Malaysia, a student database application is a central system within the EMIS ecosystem that captures the compilations of individual students that enable equity analysis. The data available in the student database application include information about parental incomes, verified by the relevant authorities, such as village heads and government officials, health records of students, administered directly by medical personnel from the department of health, attendance of students at school entered daily, disability status verified by the group teacher with relevant paperwork from the relevant authorities, types of eligible assistance, such as food programmes or scholarships, based on parental income. The Assistance Management Application is an add-on application that keeps records and reports on assistance for which learners are eligible (UNICEF, 2019). The student database application also captures information on ethnicity and sub-ethnicity, grounded on a classification provided by the National Registration Department. This study dealt with certain functions of EMIS in Malaysia while the current study concentrated on EMIS in tracking the students' records in selected public high schools in Turbo sub-county Kenya. This was to base the findings on how students' records are tracked.

A review by Yousef, Najeeb, Yazeed and Mohammad (2016), was carried out on the impact of management information systems on instructional organizations' processes. The goal was to identify the gains of MIS at Al-Madinah International University in Malaysia. Descriptive statistics was employed in generating the data from the survey questionnaires. Utilization of MIS within the organization proved that there exist inherent benefits to the technique. The system also lessened the managerial glitches and helped in the directing process. The study recommended increasing enlightenment on the significance of modern management information systems. This creates an environment that is more conducive to the application of an advanced system which satisfies faculty members and the system administrators. The study by Yousef et al., (2016) dealt with the influence and advantages of MIS at the college level. The researcher sought to fill in the gap by conducting this study specifically on how EMIS helps in tracking the students' information in the selected secondary schools.

The established design principles for learning analytics information systems (LAIS) to develop the basis for further advancement and accomplishment of learning analytics to aid learning and teaching in higher education is a study conducted by Andy, Tuure, Lesley and Don (2021). Digitization has impacted and altered how schooling works and is administered. While a huge amount of educational information is produced every minute, most institutions have not collected and used the data efficiently. Educators could use this model to review activities of learning and delete those that are not associated to the aims of the course. The review intended to invent a set of design elements that outlined a class of strategies that are means to the goals of helping learning analytics in education. The blueprint sample tracks the student inputs posted to the server and records them in the tracking logs. The system also collects stable information from several databases. The instruction details is obtained from the database and the users' information are also obtained from the database in the learning management system. Thereafter, the system transmits all the information to the analytics channels for data analysis. The review by Andy et al., (2021) mainly focused on how the information system was used in the

learning process while the current study tried to fill the gap by focusing on how EMIS was used to track the students' records in secondary schools.

A study by Bright and Asare (2019), aimed to identify the effect of the Management Information System on the University of Education Winneba, Kumasi Campus. Specifically, it assessed the adequacy of the available MIS and their utilization by students, lecturers and senior administrative staff in Winneba, Kumasi campus in support of administrative works. The literature highlighted the benefits of MIS on institution supervision, improved access to student data, decreased duties, good distribution of time and enhancement in the standards of reports to achieve the set objectives. The survey design was utilized and participants were purposively selected for the research. It was found that information systems were not fairly adequate in the university. The study recommended effective linkage of data structures to enhance their usage to the benefit of all its stakeholders. The study by Bright and Asare (2019), used a survey design which is quantitative and sampled the participants using a qualitative sampling technique therefore not adhering to the guidelines of quantitative and qualitative paradigms.

According to South Africa's Department of Basic Education (2019), the system assists schools with their multiple data administration and reporting requirements and reduces duplication in reporting since it serves as a single data source for operational information from schools for the district, province and state levels, standardizes data and reporting format that schools provide to the district and province and provides immediate retrieval of data that can assist school management teams with their multiple data requirements (Government of South Africa, 2019). This work done in South Africa focused on how EMIS was applied in the learning institutions and the different roles that it plays while this study dealt with EMIS and how the students' records are being tracked in the selected secondary schools. A study was carried out by Nkata and Dida (2020), on a structure for executing an EMIS in Tanzanian schools to ameliorate the standard of education and students' performance. In most schools the students' information is hand-operated. The manual systems facilitate the poor handling of data in schools. This study utilized structured interviews and questionnaires in the collection of data from educational stakeholders to investigate a cost-effective digital solution required. Schools in Tanzania needed a National Education Management Information System in managing the students' records. The study by Nkata and Dida (2020), focused mainly on how EMIS was going to be enforced in high schools while the current study dealt with EMIS and its usage in schools to track the students' records since its implementation.

On Students Management Information System (SMIS) for the advancement of student records in secondary schools in Kenya Karanja, Ondiek and Opiyo (2019), did a research in Kandara sub-County and school administrators, teachers and guardians participated. Further, the findings showed that 95% of administrators and 75% of teachers appreciated the usage of SMIS in their institutions which empowered them to make sound decisions using the students' records. This study employed SMIS to manage students' records in high schools while the current study was interested in determining how EMIS helps to track the students' records. A study was carried out by Akaranga and Makau (2016), on the explanative of education management information systems for Kitinga Primary School in Mwingi Central, Kenya. This study scrutinizes the role of Education Management Information Systems in making decisions. This study analyzed the obtainable information in institutions and the role of EMIS in the course of decision-making. The study by Akaranga and Makau (2016), dealt with a primary school in Mwingi Central. However, the current study tried to fill the gaps by focusing on how EMIS has been used in tracking students' records in secondary schools.

A study conducted on the evaluation of Education Management Information Systems in Kenya: A case study of Limuru sub-County, Kiambu County, Kenya by Waweru (2016), used primary data and the main method of data analysis was descriptive statistics. The study stated that upon admission of students to learning institutions in Kenya, comprehensive data such as age, sex, health status, family economic status, residence, gifts and talents, previous performance and career prospects is collected. This study highlights the role played by EMIS in institutions however; the current study dealt with the way the students' records are tracked by the principals to make sure the information is accurate and reliable for use.

6. Significance of the Study

The findings of the research might enable the government to properly plan for the resources required in the high schools as a means to avoid wastage and help in making the right decisions. Across the various subsectors of educational training, information may be useful for management and administration, for designing, and formulation of education policy and assessment mechanisms and in so doing help the schools with the proper tracking of students' records. School principals would benefit from EMIS since the information on students in terms of admission, previous examination performance, attendance, other personal data and class performance can be retrieved at a click of a button. The results of the examination might also help the principal of the school to know how they are performing and what areas ought to be improved. This facilitates a smooth running of the school activities to ascertain that the EMIS system is up to date and properly handled to ensure that the information being relayed from the secondary schools is reliable, prompt and authentic. The findings would also

help the teachers and students in the high schools to be updated with the information. EMIS came in handy in the keeping of students' records thus students' information is readily available in the system. The teachers have also benefited from EMIS since their students' information can easily be traced when needed.

7. Research design and Methodology

7.1 Designs

The cross-sectional survey design was utilized on EMIS and the tracking of students' records in selected public secondary schools in Turbo Sub-county, Kenya. The cross-sectional survey design is appropriate for studies that yearn to discover facts, circumstances, challenges or attitudes by using a population subset (Creswell, 2014). The design was appropriate to the study as it enabled the efficient collection of data from a large population. The sample selected provided the required information. Probability sampling which is the simple random sampling technique was applied to sample the principals, heads of departments and students. The proportionate stratified random sampling procedure was used for class teachers from the selected public secondary schools in Turbo sub-County, Kenya. Yamane's 1967 formula was utilized to calculate the sample size.

$$n = \frac{N}{1 + N(e)^2}$$

Where n is the sample size, N is the population size and e is the sampling error (0.05).

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{33}{1 + 33(0.05)^2}$$

n = 30 Schools and Principals

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{297}{1 + 297(0.05)^2}$$

n = 170 Heads of department

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{792}{1 + 792(0.05)^2}$$

n = 265 Class teachers

$$n = \frac{N}{1 + N(e)^2}$$

$$n = \frac{14405}{1 + 14405(0.05)^2}$$

n = 389 students

The simple random sampling and proportionate stratified random sampling were suitable because all the items in the community had an equal chance of being selected as a sample for the study therefore, making it achievable to include many participants who were selected randomly. This method of sampling is fit this is because only when the items have been selected with known probabilities that one is able to assess the precision of the sampling result (Popoola, 2011).

7.2 Description of Research Instruments

The research instruments utilized were questionnaires and interview schedules. The questionnaires were suitable because the questions reached a large group of respondents within a short time and with little cost. The closed-ended questions were used since they were quick to answer and they improved the answering rate of the participants (Creswell, 2014). The semi-structured interview was used to interview the principals, heads of department and the class teachers. The semi-structured interview schedule was suitable because the questions were pre-determined and clarifications to the questions were also given. This enabled the interviewees to give detailed answers to the questions asked thus making the process more interactive.

7.3 Validity and Reliability

Validity was ensured through content and face validity. That is by seeking judgment from Subject Matter Experts, SME: three lecturers in the department of education validated both the questionnaire and the interview schedule. The experts reviewed the face and content validity whereby they dealt with how the questions had been constructed. Thereafter they returned the research instruments to the researchers with comments and recommendations which the researchers followed up on them for corrections. To ensure the reliability of the research instruments, the data collection tools were measured using the split-half reliability. The results in the two sets were compared statistically by use of the split-half reliability formula and a coefficient of 0.9 was obtained which suggests that the items had relatively high internal consistency. Thus this method was suitable as

it helped in improving the veracity of the results.

7.4 Data Analysis Procedures

Responses from questionnaires and interview schedules were categorized, coded and entered into the computer for computation using SPSS software. Descriptive statistics such as frequency and percentages were utilized to summarize the data. The information from the interview schedule was coded into categories and then edited, transcribed and summarized. The findings were interpreted and discussed in relation to the reviewed literature.

8. Results and Discussions

This section entails the presentations, interpretation and discussion of the research findings on how EMIS helps in the tracking of students' records in secondary schools.

8.1 Education Management Information System and the Tracking of Students' Records in secondary schools in Turbo Sub-County, Kenya

This section endeavours to give answers to the main research question; specifically on admission about personal data, class placement and end-of-term results.

8.1.1. Classification of Students during the Admission Day

The researchers wanted to know how the students were classified into different classes when they joined Form One and the response from the class teachers were as follows in Table 1.

Table 1: Classification of Students during the Admission Day

Classification of Students'	Frequency	Percent
Streams	47	48
Admission number	29	30
KCPE Marks	19	19
Gender	3	3
Total	98	100

The results from table 1 show that 48% were classified according to the streams when they joined Form One. This indicated that most schools preferred classifying the new students in accordant with the different streams. A study conducted by Mansor, Maniam, Hunt and Nor (2016), explored the streaming of students for a year in schools using their past results. Streaming in schools is successful due to the advantages that they have. For instance, it provided a systematized teaching programme for teachers and lowered social stress that facilitated learners to establish attainable objectives and increase motivation. The students already knew their level of ability in their streams thus easier to achieve their goals since they already knew what is expected of them. Streaming helps in the organization of students' information therefore, making it effortless to categorize the students through EMIS. Moreover, 30% of the learners were classified as per their admission numbers given during the reporting day that they joined Form One. The classification of students aids in the easy recognition of the apprentices who have diverse backgrounds and characteristics. The admission numbers are applied in schools to distinguish the student population. The admission numbers are given to the new students and this addresses the students admitted to the institution. In an interview conducted by the researchers, the heads of the department agreed that the categorization of students was beneficial. One head of the department had this to say:

Using admission numbers to categorize the learners in schools is the most effective. When the students join Form One they are given the admission number to utilize the school facilities. The admission number helps in identifying the students since there exist students who share the same names but the number distinguishes them. This makes the work easier while entering their details in EMIS (Head of Department 7: 26/10/2021).

A study by the education department in the United Kingdom (2021), mentioned that in deciding the admission arrangements, all admission authorities must set an admission number for each relevant age group in school. This study implied that students joining the various educational institutions were given an admission number relying on their age group. Therefore the findings imply that admission numbers are important in institutes to distinguish the learners and the schools to know their population. This also enables the teachers to differentiate the learners who share the same names. EMIS is quite useful for the retrieval of records in such a scenario. The other 19% were classified according to their KCPE marks. Using KCPE marks indicates that those students with high marks are grouped while those with low marks are admitted to one class. This concurs with an interview schedule conducted by the researchers whereby one class teacher stated as follows:

I categorize the learners in class according to their performance. This includes the different abilities in how they performed in the KCPE examinations. Categorizing the students helps to identify the students who require more attention in their studies and those that are average or above average. Classifying the learners also helps to seek out the different abilities and skills of the learners making work easy while entering their details into EMIS (Class teacher 25: 20/9/2021).

A study by Tessler (2018), highlighted that varied admission criteria and standards stem from the differences in the significance of the admission criteria used by the admissions office of the school. Some admission officers believe that the quantitative criteria such as measurable requirements, including grades and test scores are most important due to the research on the predictability of student success. This study therefore implies that different institutions use different methods of admitting students to schools most especially by critically observing the students' achievements from the previous examinations. The study concurs with the findings that tracking the learners' information at the entry to form one is important for educational institutions to know the students that joined their school and the different characteristics of the apprentices. The categorization of the learners facilitates easy identification of students through EMIS. The other 3% of the informants were categorized based on their gender. In the mixed secondary schools, boys and girls are classified separately whereby the different genders have their classes. Students in different schools are classified differently according to the type of their institution. The class teachers from mixed schools stated that classifying students as per gender was effective because recording the class attendance was much easier. An interviewed class teacher explained as follows:

Before the learners in this school were separated into different classes according to their gender, I had countless work to do. Recording their class attendance manually, daily and checking up on the students was quite challenging. But I am delighted that the boys and girls were separated into the different classes, therefore, making my workload much easier and bearable. (Class teacher 15: 14/10/2021)

A study conducted by Sheymardanov (2018), states that separate teaching of boys and girls yielded higher academic performance in some disciplines and decreased aggression and adolescent depression. Consequently, ensuring quieter behaviour of self-assured young males and successful self-realization of young females in their careers and family. This study argued that separating the students by gender had benefits in the attainment of certain subjects since the students tended to perform well when taught separately from the other gender. The study established that the students' categorization according to gender mainly depended on the school. In the mixed schools, the class teachers prefer separating boys from girls since their role as class teachers is reduced. Therefore gender plays a responsibility in the classification of students.

8.1.2 End of Term Results

Education Management Information System is also useful in tracking the examination results by different stakeholders: school administrators, parents, guardians and students. The students indicated how EMIS facilitated them to send the examination results as shown in Table 2.

Table 2: End-of-term results

Receiving the end-of-term results	Frequency	Percent
Zeraki	100	26
Manually	200	51
WhatsApp	24	6
Short Message Service	65	17
Total	389	100

The outcomes from table 2 indicate that 26% of the students received their results through Zeraki which is an online application that functions like EMIS. Zeraki has helped a lot in reducing the cases of students changing their results since the application directly sends the results to the guardians showing the students' performance throughout the term. The online application has ameliorated how the learners obtain their results since the digital platforms are being embraced and their benefits are tremendous. On the same matter, the principals applauded the online platforms. A principal interviewed stated as follows:

Zeraki has increased the precision of the results being released to the students since the results are easy to be understood by the parents. In my school, we use Zeraki to monitor and analyze the students' records on their performance. This has enabled us to predict the students' results in their exams since there are clear patterns which predict their performance (Principal 10: 16/09/2021).

According to Nyangolo (2022), the application tracks the students' performance in schools. It indicates the performance in each subject, form and topic. Zeraki monitors the students' study patterns. The application can be applied offline and this caters for learners who cannot access the data bundles. Zeraki has enabled schools to track the students' records accurately using the user-friendly application. Therefore, some schools use both Zeraki and EMIS to track the students' records. The application of EMIS has been applauded by the class teachers since it has enabled the student' records to be handy when required. A class teacher explained as follows:

In my class, all the students' records are kept in the EMIS. This has made it easier to trace the details of my students easily. For example, I can check each student's results in the portal with much ease. I just type the students' numbers in the portal and all the information about the learner is made available (Class teacher 20: 18/10/2021).

It is therefore a fact that the online systems improve the storage of students' records to be easily accessible when needed. This is why the researchers maintain that EMIS helps in tracking and predicting the students'

performance since the system analyzes the students' performance according to every examination written. Consequently, it enhances the accountability of the student's records. The students who receive their results manually have the top ranking percentage of 51% when the school closes. Many schools still use the manual method of giving the students their results. At times the students change their marks to please their parents. This has made many students to deceive their parents about doing well in school yet that is not the case. A study by Lawal, (2018) asserted that within the manual school management system, there are chances of tampering with students' records. Sometimes the results are falsified and they tarnish the name of the school. The receiving of results manually means that the class teachers are forced to update the EMIS later on. The same idea was supported by an interview whereby one head of department had this to say:

Frequently the students' data are recorded manually before they are updated into EMIS. However, recording the students' performance using the manual management system has disadvantages. At times the said documents are misplaced or lost for some reason. (Head of Department 13: 09/09/2021)

It is obvious that using the manual means of storing and recording the students' data for example on their performance has several disadvantages and consumes time. In addition, 17% of students indicated that their feedback is sent directly to their parents through the Short Message Service. This helped the parents to be notified since they get immediate feedback on the students' results wherever they do any examination. The findings concur with Berlinski, Busso, Dinkelman and Martinez (2021) who stated that parents received high-frequency data about their selected child via text messages recognized as Short Message Services (SMS). The specific information covered attendance, behaviour and test scores of their learners. Using low-cost technology to deliver existing data on student grades, attendance and behaviour at higher frequency could significantly raise human capital attainment down the line and improve educational outcomes. Therefore, the researchers conclude that sending the SMS to parents greatly improved their involvement in their student's academic journey. It also ensured that students could be assisted more easily in areas they were lagging to improve their performance.

The other 6% stated that their results were forwarded to their parents through WhatsApp. WhatsApp as an online platform helps the teachers to communicate with the parents through the different class groups formed and this has helped to increase the communication between the class teachers and the students. WhatsApp helps in tracking and storing the students' data on their performance stemming from the EMIS. A study by Wasserman and Zwebner (2017) stated that mobile devices, especially smartphones, changed the rules of the game in the frequency of conversations between parents and teachers. That implies in its state as both a private discussion and as an open discussion, in its graphic illustration that institutional issues guide the proprietors of cell phones the tutors and guardians similar anywhere, whenever and continuously. The new media channels allow easy and effective involvement which enables rapid and systematic two-way communication thus greatly influencing the pupil's achievements to produce accurate results. The principals noted that the new technologies particularly EMIS have reduced the duplication of students' records. Only the individual students' EMIS number is used to update their details in the portal. It facilitates each student to have their details in their portal. The theory by Rogers highlights that the easier it is for individuals to see the results of innovation the more likely they are to adopt it. The apparent results bring down the doubt and induce conversations about the innovation this is because there tend to be more questions asked about the new idea. Thus when the schools see the advantages of using the new technologies to manage schools this results to the eagerness to learn how to use them to enhance the quality of the education provided. The researchers agree with the findings as both the teachers and the parents benefit from using the WhatsApp platform to communicate on the different issues for instance the students' performance in their examinations. Using EMIS as a program has been appropriate since it facilitates accurate results.

9. Summary of the Findings

The application of EMIS on the tracking of students' records indicates that students are classified according to streams, admission numbers, KCPE marks and gender during the admission day. The grouping of students during the admission day was necessary to facilitate the easy identification of the recent learners in EMIS. The students receive their end-of-term results in different ways which included manually, Zeraki, SMS and WhatsApp. Different schools have diverse methods of recording the students' information. Although the schools are emboldened to use EMIS, some still record students' results manually. Schools used EMIS to record and send the academic results of the learners to their parents.

10. Conclusion

The students are classified differently when they join Form One and this aids in the identification and tracking process. The classification can be through the use of streams, admission numbers, KCPE marks or gender depending on the type of school. It is therefore concluded that the schools use different ways to classify the students regarding their data in EMIS. This classification has facilitated easy identification and tracking of the students' data in the school. Students also receive their end of term results relying on the method the schools use to track their data. Schools use various ways to send the feedback of the examination to the learners and this has

facilitated proper tracking of the students' academic performance. The outcome of the examinations of the learners is tracked and sent through the progress reports in EMIS.

11. Recommendations

The principals should classify the new form one students according to the time and date that they reported into the secondary schools. This will guarantee that the students' information is captured and tracked accordingly to enhance an accurate collection of the learners' details. This will facilitate the easy identification of students who require special needs. The students' results should be electronically sent directly to their parents and guardians while the students given their feedback manually.

12. Suggestions for Further Research

Further research is recommended in the following areas:

The study was carried out using EMIS. Thus the researchers recommend that a study should be done in high schools to discover other management systems used in schools and how effective they are in tracking the students' records as well as those of the institution. A national study ought to be done regarding the difficulties encountered with the utilization of EMIS and tracking of financial resources in the public high schools.

References

- Abdul-Ahmid, H., (2014). What Matters Most for Education Management Information System: A Framework Paper. *SABER Working Paper Series; No.7*. World Bank Group, Washington, DC: World Bank.
- ADEA, (2017). *Role of EMIS in Africa*. Abidjan: ADEA.
- Akaranga, S.I., and Makau, B.K., (2016). The Hermeneutics of Education Management Information Systems for Kitinga Primary School in Mwingi Central – Kenya. *Journal of Education and Practice*, 7,(35) ISSN 2222-1735 (Paper) ISSN 2222-288X (Online). www.iiste.org
- Andy, N., Tuure, T., Lesley, G., and Don, S., (2021). Design principles for learning analytics information systems in higher education. *European Journal of Information Systems*, 30:5, 541-568, DOI: 10.1080/0960085X.2020.1816144
- Berlinski, S., Busso, M., Dinkelman, T., and Martinez, C.A., (2021). Reducing parent-school information gaps and improving education outcomes: Evidence from high-frequency text messaging in Chile. National Bureau of Economic Research Working Paper No. 28581 <http://www.nber.org/papers/w28581> March 2021, Revised November 2021 JEL No. D8,I25,N36
- Bright, A.A., and Asare, G., (2019). The Impact Of Management Information System On University Of Education Winneba, Kumasi Campus Ghana. *European Journal of Research and Reflection in Management Sciences*, 7(1), ISSN 2056-5992.
- Creswell, J.W., (2014). *Research Design: Qualitative, Quantitative and Mixed Methods Approaches*. (4th Ed.) Thousand Oaks: SAGE Publications.
- Department of Education, (2021). School Admission Code: Mandatory requirements and statutory guidance for admission authorities, governing bodies, local authorities, schools adjudicators and admission appeals panel. The United Kingdom.
- Fedena, (2020). *How EMIS is a Backbone of Modern Institutions*. New Delhi: Foradian Technologies.
- Government of South Africa, (2019). *What is SA-SAMS?* Johannesburg: Department of Basic Education.
- Lawal, I.B., (2018). Development of Computerised Students' Results Processing System. *International Journal of Scientific & Engineering Research*, 9(4), ISSN 2229-5518.
- Karanja, J.N., Ondiek, C.O., and Opiyo, E.T., (2019). Adoption of Students Management Information System for the Development of Student Records in Secondary Schools in Kenya. *The International Journal of Humanities & Social Studies*, 7 (8). DOI: 10.24940/theijhss/2019/v7/i8/HS1908-060
- Mansor, A. N., Maniam, P. P., Hunt, M. C., and Nor, M. Y. M., (2016). Benefits and Disadvantages of Streaming Practices to Accommodate Students by Ability. *Creative Education*, 7(2547-2558). <http://dx.doi.org/10.4236/ce.2016.717241>.
- Medlin, B.D., (2001). The factors that may influence a faculty member's decision to adopt electronic technologies in instruction (Doctoral dissertation, Virginia Polytechnic Institute and State University, 2001). ProQuest DigitalDissertations. (UMI No. AAT 3095210).
- MoE, (2017). *National Education Management Information System*. Nairobi: Government Printers.
- MoE, (2021a). *Ghost Students*. Nairobi: Government Printers.
- Nkata, A. S., & Dida, M. A., (2020). A Framework for Implementing an Education Management Information System in Tanzanian Secondary Schools to Improve Delivery of Quality Education and Students' Academic Achievement. *Journal of Information Systems Engineering and Management*, 5(2), em0113. <https://doi.org/10.29333/jisem/7858>
- Nyangolo, I., (2022). *Zeraki Learning*. Nairobi: Litemore Limited.

- Popoola, S.O., (2011). *Research Methodologies in Library and Information Science*. Ota: Nigerian Library Association.
- Rogers, E. M., (2003). *Diffusion of Innovations* (5th ed.). New York: The Free Press.
- Sheymardanov, S., (2018). Male Students' Separate Education. *Journal of Social Studies Education Research*. 9 (1), 187-200 www.jsser.org
- Tessler, A, R., (2018). Making college admission count: the importance of admission criteria in the current undergraduate admission process. *Theses and Dissertations*. 2574. <https://rdw.rowan.edu/etd/2574>
- UNICEF, (2019). *Review of Education Management Information Systems (Emis) That Track Individual Student Data Malaysia*. Pranakorn: UNICEF East Asia and the Pacific Regional Office (EAPRO).
- UNICEF, (2020). *Education Management Information Systems that Track Individual Student Data in Mongolia*. Asia. UNICEF East Asia & Pacific.
- Wasserman, E., and Zwebner, Y., (2017). Communication between Teachers and Parents using the WhatsApp Application. *International Journal of Learning, Teaching and Educational Research*, Vol. 16,(2), pp. 1-12, <https://doi.org/10.26803/ijlter.16.12.1>
- Waweru, J. M., (2016). Assessment of education management information system in Kenya: A case study of Limuru Sub-County, Kiambu County, Nairobi University. (Unpublished MA thesis). The University of Nairobi, Nairobi, Kenya.
- Yamane, T., (1967). *Statistics: An Introductory Analysis*, (2nd Ed.) New York: Harper and Row.
- Yousef, A.B.E., Najeeb, A.A., Yazeed, A.M., and Mohammad, M.S.A., (2016), The Impact of Management Information System in Educational Organizations Processes. DOI: 10.1109/IC3e.2016.8009060. <https://www.researchgate.net/publication/319118575>

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