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Adoption of Students Management Information System for the Development of Student Records in Secondary Schools in Kenya

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Abstract:

The Government education institutions identified the student management information system (SMIS) as a key contributor for building trust and confidence for the general education institutions in the heart of any nation or state. SMIS has been visualized to not only help the teachers and administrators to have better monitoring and control of the functioning of the education institutions but also many other education stakeholders across the nation who needs decision support indicators. This study established the extent to which adoption and implementation of SMIS in education institutions and determined the extent to which SMIS promoted management decision making, academic practices and increasing demand for students information use. Target population was school administrators, teachers and parents in Kandara Sub County. A sample size of 200 respondents was used and questionnaires were the data collection tools. Findings showed that 90% of administrators had already adopted and implemented the use of SMIS in their institutions, 87.5% of teachers had adopted and implemented the use of SMIS in managing students' data and information while 75% of parents appreciated the adoption and implementation of SMIS in the institutions where their children were learning. Further, 95% of administrators and 75% of teachers appreciated the use of SMIS in their institutions which has enabled them to make sound decisions regarding students' data and information. The study recommends adoption and implementation of SMIS since it helps institutions' administration manage various operations including students' data and information.

Keywords: Students management information systems, learning institutions, Kandara, Kenya

1. Introduction

The introduction of students' management information system in an educational institution requires careful planning, like any powerful tool, can do much harm as good. Therefore there is need to ensure that the adoption of SMIS in schools is used for enhancement of quality of management of students data, such as; registering students in courses, documenting grading, transcripts production, students examination results, other assessment scores, building students schedules, tracking students attendance and managing many other students related data. Schools and educational institutions bear the tremendous responsibility of ensuring that the introduction of SMIS into the Education institutions is managed with great care so that the potential benefits are realized.

The sustainability of SMIS in the education system is expensive. The capital cost of the equipment needed to begin the process of integration is obvious. A little less obvious is the high level of recurrent costs associated with the effective use of SMIS. An attempt must therefore be made to maximize the benefits of such a large investment while at the same time developing cost effective maintenance procedures.

Therefore, it is important for institutions to plan on how they want to use student management information system in tracking students' progress in any academic institution. This document provides guidelines for this research process for schools that are starting or those that have already established SMIS in their institutions. Furthermore, the educational institutions are urged to first reflect on what they want to achieve when adapting SMIS in their institution. Student management information system is designed to help institutions to track students' progress for effective management. Extensive information based on students is readily available through this system. Viewing student data, managing admission and lecture rooms, managing seats, board, semester, faculty, examination, block allocation, subject management, scheduling exam, result and related issues are made simple and easy. There is creation of database queries to aid in finding student information, determining their progress and working on their records. This can make the system

easier to navigate and to maximize the effectiveness of time and other resources available. SMIS allows the keeping of personnel data in a form that can be easily accessed and analyzed in a consistent way.

Otherwise, Hamilton and Chervany (1981) argued SMIS effectiveness is defined as the extent to which a given SMIS actually contributes to achieving organizational goals, i.e. its effect on organizational performance. However, there is no consensus among IS researchers on the conceptualization of IS effectiveness (DeLone & McLean, 1992; Goodhue, 1992; Hamilton & Chervany, 1981; Ives & Olson, 1984; Milner & Doyle, 1987). In previous researches, IS effectiveness was expressed by measuring cost-benefit analysis, system usage estimation, user satisfaction, incremental performance in decision-making effectiveness, utility analysis, analytic hierarchy approach, and information attributes examination (King & Rodriguez, 1978; Srinivasan, 1985). The difficulties with measuring educational institutional effectiveness are reflected in the conceptualization and measurement of SMIS effectiveness. Similarly, it is pointless to search for a precise measure or set of measure of SMIS effectiveness that will be common across all education institutions. In a single institutional, the effectiveness criteria can vary with changing value structures of the people involved in evaluation, organization levels, and phases in institutional growth (Miller, 1989).

1.1. Problem of Research

The use of student management information system in educational management has rapidly increased across the nation due to its efficiency and effectiveness. In the initial stages of its development, student management information systems (SMIS) main purpose was to improve the efficiency of institutional office activities, and to store students' data and information. The study aimed at assessment of the adaption of Students management information system, regarding the enrolment procedures and keeping students records in terms of; the demographic information, admission requirements; subject enrolled, class schedule and the overall performance of a student. Many head of institutions don't have an idea on the usefulness and functionality of SMIS, it's applications in management and also how it assists student's evaluation in examinations, tracking students on their progress, generating feedback to both teachers and parents and also lack of knowledge on how SMIS maintain confidentiality and security of data. Therefore, most school managers don't appreciate the use of SMIS and even not understanding on the status and capabilities of applying SMIS in schools, hence opting to remain in current manual system which has increased the tasks especially on the delivery of enrolment procedures and keeping of student's records. Therefore, the research will help them to adopt the SMIS and know the importance and practical use of SMIS. A number of inhibitors or challenges to SMIS use are evident in the literature; foremost among these are lack of time, lack of confidence or skills, lack of training, lack of support from senior management and lack technical support. SMIS can provide administrators and teachers with the information required for informed planning, policy-making, and evaluation. SMIS have changed school management in the areas of leadership, decision making, communication, responsibility, and planning. This system can assist the school manager in organizational of students' progress and success.

1.2. Objectives of the Study

- To establish the extent to which adoption and implementation of student management information system in education institutions.
- To determine the extent to which student management information system promotes management decision making, academic practices and increasing demand for student's information use.

1.3. Research Question

- To what extent does the adoption and implementation of student management information system in education institutions?
- To what extent does student's management information system promote management decision making, practices of academic activities and increasing demand for student's information use?

1.4. Hypothesis of the Study

- Education institutions have adopted and implemented students' management information system.
- Students' management information system promotes management decision making and practices of academic activities in increasing demand for student's information use.

1.5. Scope of the Study

The study covered the extent to which educational institutions have adopted and implemented SMIS. Furthermore, the extent to which SMIS promoted the management in the area of leadership, communication, planning, decision making and practices in academic activities. The research was conducted only on the management (school administrators), teachers and parents who are in increasing demand for student's information use in any learning institution.

2. Literature Review

Before 2009, the most agencies of education in Kenya used hard tools such as calculator, electronic spreadsheets to perform collecting education information at all levels for educational management purposes. Each year MOET need from each school to provide updated data and educational information management to MOET, each time it took about three months for collecting sufficient data of national wide. However, since data were collected by the manual method, so

not only don't guarantee timely but also data quality was not good: this affected negatively management decisions in educational agencies. Nolan and Seward (1974) argued the system usage; success ultimately depends on how well the SMIS has supported decision-making (Nolan & Seward, 1974). Indeed, according to Kenyan Education Law 2005, the principal is responsible for all activities in schools and educational outcomes of schools, especially decisions related to the learning of the school and students' managements. Moreover, with the goal of SMIS software is to provide powerful tools for director in the management of education in schools. Therefore, we can say, the satisfaction of director plays important role in the success of SMIS in school management.

In discovering computers in 2007, a computer based information system is described as the "collection of hardware, software, data, people and procedures that work together to produce quality information" These information systems provides opportunities to improve student's learning process by providing alternatives ways for administrators and teachers to use students management information system in managing students data and information (Shelly et al., 2007), and they enhance management capabilities of students. For example, in many schools today student management information systems are being implemented, which allows parents to view their children's academics report online, to observe classroom behavior through captured videos and to go online to access their children's progress in both academic and extra curriculum activities. These exciting and modern applications of computer-based information systems not only gain popularity in the learning institutions but in-home environment as well.

2.1. Centralized Information Sourcing and Management

According to Marrero (2010) in his study entitled "student information system for the university of the cordilleras" stressed that the concept of information systems (IS) emerged in the early 1960s. Indeed, when information system is defined, information science is always inclusive; information system is an academic field that deals with collection, storage, organization, generation, analyzing, dissemination and retrieval of recorded knowledge. Furthermore, it is a gathering of related components designed to support operations, management, and decision making in any education institution.

2.2. Monitoring Students Related Activities

The SMIS enables compiling of all the important data from a single source, especially that of a students and teachers in learning institution. This electronics storage of institutional data cuts down the cost and use of papers at all levels and also minimizes the time spent in retrieving the data. Such as availability of all the required information, in the electronic form facilitates easy retrieval, and dissemination of education reports. It is possible to store all students-related data such as class attendance, test performance, and exam analysis report in the system, which is shared with the parents, and other education stakeholders. Examination timetable and scheduling of examination dates can be easily handled by a student's management information system. It integrates all details such as availability of teachers in supervising of exams and completion of course units' syllabus before announcing the examination dates. Details of all written examinations, appraisals from different school activities, marks awarded and grades offered, and educational progress made by the students can be recorded for easy retrieval and dissemination.

2.3. Integrating Parents, Teachers and Administrators

The benefits of student's management information system enable user interact and work with pioneering features, such as; Maximize students' management and also improve parent's communication to or from the school on their children progress. Smart management of student and staff data makes chaotic schedules, stress-free operations and easy to manage. A splendid student performance and success streamlines and simplifies everyday administrative tasks. According to Evangelista (2011) the university's Student information system (USIS) enables interactive computer system that allows user access grade scored, examination reports, transcripts, schedule of classes, and remaining balance for the semester and register online for classes. Through the information system, students would be assigned a registration number which is unique for easier identification and follow up. All data to and from the university would use that unique identifier for each student. The stored individual students' records provide; better quality data to drive streamlined policy decisions which enhance educational opportunities for all students, reduce data collection burden through a web enable SMIS and as a tool used by parents in monitoring the academic performance of their children.

3. Research Design and Methodology

3.1. Research Design

Research design is a plan and the procedure for research that span the decisions from broad assumptions to detailed methods of data collection and analysis (Johnson & Onwuegbuzie, 2006). The research design adopted for this study was quantitative and qualitative design. The blending of qualitative and quantitative methods neutralized bias, converged the results and produced final product which highlighted the significant contribution of both approaches.

3.2. Target Population and Sample Size

Mugenda and Mugenda (2003) denoted that a sample is a subset of a particular population. Generally, the sample size depends on factors such as the number of variables in the study, the method of data analysis, the size of accessible population and the type of research design. Sampling is a process of selecting units from a population of interest so that by studying the sample, one may fairly generalize the results back to population from which they were selected In this study

stratified random sampling was employed by dividing the target population in ten strata on the basis of the 100 institutions (Mugenda & Mugenda, 2003), Gay (2006) suggests that for correlation studies, 6 cases or more are required. In this study, the target population comprised of school administrators, class teachers and parents. Stratified random sampling was employed by dividing the target population in five strata on the basis of the five locations in Kandara Sub-county forming a sample size of 100 administrators, 80 class teachers and 20 parents. The total sample size was 200 respondents as shown in Figure 1.

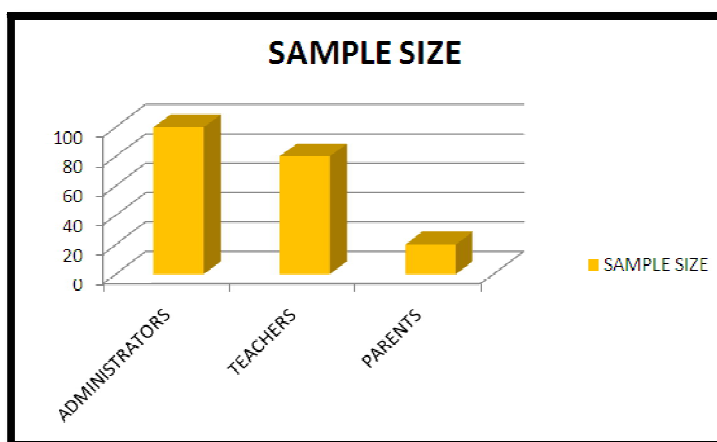


Figure 1: Sample Size

3.3. Research Instruments

The data collection instruments included an in-depth interview with school administrators, class teachers and parents using questionnaires. The questionnaire items comprised of both close ended and open-ended questions, as well as matrix items that give the advantage of collecting both qualitative and quantitative data to generate maximum required information.

3.4. Validity of the instruments

Validity answers whether the data collected are accurate enough to reflect the true happenings in a study (Mugenda & Mugenda, 1999). In this study, pilot was used to validate research instruments to determine accuracy, clarity and sustainability of the instruments. The questionnaire was pretested using a sample of three administrators, four teachers and two parents, since two or three cases are sufficient for some pilot studies (Borg & Gall, 1989). Based on analysis of the sample study results, rectification was made to the research instruments. The researcher's supervisors helped the researcher to assess the concepts the instruments were to measure in order to determine whether the set of items accurately represents the items under study. The recommendations from the supervisors were used to enhance the validity of the instruments.

3.5. Reliability of the Instruments

A correlation coefficient was adapted which indicated the reliability of the instrument used. The scores were correlated using Pearson's product moment co-efficient and this was taken as an estimate of reliability. The co-efficient of 0.7 was attained, the instruments were adopted for use in the study otherwise necessary adjustments would have been made to the research instruments.

4. Research Findings and Analysis

4.1. Adoption and Implementation of SMIS on Students' Management

The findings in Table 1 show the extent of adoption and implementation of SMIS in institutions.

	Frequency	Percentage	Cumulative percentage
Administrators	90	90	90
Teachers	70	87.5	177.5
Parents	15	75	252.5

Table 1: Extent of Adoption and Implementation of SMIS In Learning Institutions

Findings showed that majority of administrators (90%) had already adopted and implemented the use of SMIS in their institutions, whereby only 10% had no idea on the importance of SMIS in their institutions. 87.5% of teachers had implemented and adopted the use of SMIS in managing students' data and information. This finding is an indicator that majority of administrators and teachers appreciated the adoption institution. 75% of parents appreciated the implementation of SMIS in the schools where their kids are learning since it enables them able to view their children report card online, to observe classroom behavior, their academic progress, school fees balances, academic meetings.

These exciting and modern applications of computer-based information system not only gain popularity in the schools but in the home environment as well as per the findings.

4.2. Promoting SMIS through Informed Decision, Academic Practices by Increasing Demands for Student's Information Use

Figure 2 shows how the school administrators and teachers have adopted SMIS in decision making, academic practices in increasing student's information use.

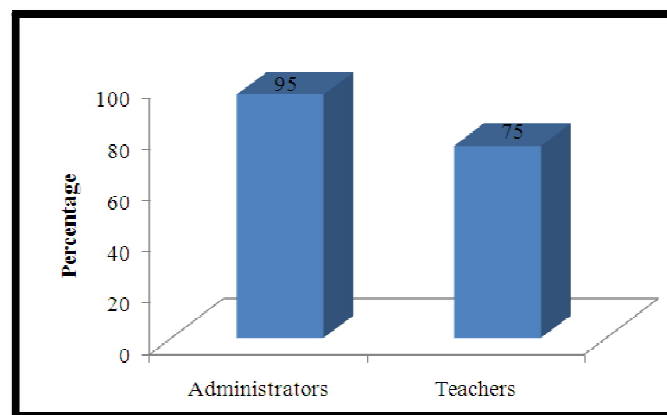


Figure 2: Administrators and Teachers Responses

Figure 2 shows that majority of the administrators (95%) and teachers (75%) appreciated the use of SMIS in their institutions which has enabled them to make sound decisions regarding students' data and information. SMIS can help to save data of students that is collected and then stored in a centralized place, which enable administrators and teachers to view the data. This data can be saved and at a later date be used for decision making and also used for comparison with the past or future data and able to draw a conclusion. This data can be processed into information that can be printed in a report. Similarly, to this, SMIS allows students grades to be posted where parents can view their grades, also helps teachers to keep students accountable and parents informed.

5. Discussions

5.1. Admission of Students to the Institution

Most of the student information systems are created with an objective to store details of students' information and make them accessible in an integrated system, whereby SMIS response to all admission-related queries. During the enrolment of students, the systems stores all the main details related to the students and needed by the institution. Use of such database in administrative, where student information system increases the functional efficiency of an institution and improves timely decision-making processes at all levels. Availability of a student records system containing all information details at a single source, which enables easy percolation of the right information.

5.2. Centralized Information Sourcing and Management

Student management information system is used to face various issues related to students, administration and teachers in a wider perspective by providing a complete management information data satisfaction. SMIS enables students to access information about various programs offered, courses and units done, fee required per semester or per year, both academic and co-curriculum progress, and careers for each specialization at the same time managing the academic requirements of the students and the administration. The designed SMIS in the account office contains all payable accounting module system used to maintain a general ledger, billing of students and receivable details. Also, the inbuilt automated contact management mailing in the system enables parents to receive systematic, regular mails with details about any fees paid or to be paid by the students through their parents or guardians.

5.3. Monitoring Students Related Activities.

A complete record of students' classes' attendance, assignments given and completed also absent details is stored in the database system. The reminder option in the system alerts the institution management about the irregular class attendance; assignments not completed or absent details for further action. SMIS offers a complete follow-up on all the discipline records of the students. With the appropriate inputs, administration is able to follow up on bad elements to maintain institutional good performance and discipline. The system facilitates recording of all communication details with the students and parents on for regular follow-up on their progress and for future use.

5.4. Integrating Parents, Teachers and Administrators

Student's management information system is integrated with the parents' portal for regular update of student-related information and feedback. The real-time available of all student-related information such as marks or grades obtained in examinations, class attendance student overall performance, examinations timetables enables parents, teachers and administrators to interact through information sharing using the web designed interface in SMIS for improving student' performance.

6. Conclusion and Recommendations

Any learning institution that adopts and implements SMIS has advantage in using a computer management information system. The system can automate tasks for teachers and administrators allowing them to spend time on other important tasks such as creating database when enrolling students, which includes: their names, admission number, class they are in, name of the dormitory, parent's details and contacts, their home area, health status and their previous performance. Another advantage of using SMIS is that it can help you to save students data that is collected and then stored in one centralized place. This will allow parents, administrators as well as teachers to monitor students' progress. The data can be saved and at later date be viewed or used in correlation with other past or future data. The data can also be processed into information that can be printed in a report. Similar to this SMIS allows students grades to be posted where parents can view them. This helps teachers to keep students accountable and parents informed.

6.1. Training of Education Administrators and Teachers on SMIS

A disadvantage to the adoption of SMIS is that it may cause frustration for educators that are not computer literate, which may lead to misuse of SMIS or no use of it at all. All the administrators and teachers should be trained on how prepare SMIS in their institutions so that all students data and information can be stored, saved, processed, analyzed, and also retrieved for decision making, for future reference, for comparison purposes and for information purposes generated in form of a report.

6.2. Students' Management Information System Components Module

The SMIS module is a component covering many other student aspects from admission to completion. The system records basic personal information, admission and education history regarding students. Student's management information systems provide the ability to "read" applications and enter relevant data to applicable database fields, notify student, parents and provide feedback. Student management information system involves:

- Manage new admission and enrolment for students.
- Manage Fees Structure, fees payment and fees balances.
- Manage students' admission number generation.
- Basic Information for students and their parents' details.
- How departments are managed in support of student's performance.
- Manage designation of teachers in all departments.
- Manage students' subject combinations and the teaching staff timetables.
- Manage semester and academic year.
- Manage students' admission criterion and management.
- Management of Examination in terms of; timetables, examination dates and time, supervisor in charge from all faculties.
- Examination result and students' performance progress.

A student management information system manages students' Academic records and information. SMIS can handle subject combination management, classes and examination scheduling, keeping personnel records, grades attained and comments, room allocation and resource management. SMIS helps school's administration manage various operations including students' data and information. These systems are needed in any learning institution for all the parties involved in education; board of management, parents, students, teachers', alumni, administrators. And other stake holders like Board of Management of the institution.

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8. References

- i. Al-adaileh, R, 2008. "Essentials of Management Information Systems", Yazeed Publications, Karak-Jordan.
- ii. Alavi, M., Carlson, E & Brooke, G. (1989). The ecology of MIS research: A 20-year status review. In J. I. Degross, J. Henderson & B. Konsynski (Eds), Proceedings of Tenth International Conference on Information.
- iii. DeLone, W.H. & McLean, E.R, 1992. "Information Systems Success: The Quest for the Dependent Variable", Information Systems Research, Vol. 3, No. 1, pp. 60-95.
- iv. DeLone, W.H. & McLean, E.R, 2003. "The DeLone and McLean Model of Information Systems Success: A Ten-Year Update", Journal of Management Information Systems, Vol. 19, No. 4, pp. 9--30.
- v. Goodhue, D. (1992). User evaluations of MIS success: What are we really measuring? In J. E Nunamaker & R. H. Sprague (Eds), Proceedings of the Twenty-fifth Annual Hawaff International Conference on System Sciences (Vol. 4, pp. 303-314). IEEE Computer Society Press.
- vi. Hamilton, S. & Chervany, N. L.(1981b). Evaluating information system effectiveness part II: Comparing evaluator viewpoints. MIS Quarterly, 5(4), 79-86.

- vii. Huh, Y.U., Keller, F.R., Redman, T.C., Watkins, A.R., 1990. Data quality. *Information and Software Technology* 32, 559–565.
- viii. Ives, B. & Olson, M. H. (1984). User involvement and SMIS success: A review of research. *Management Science*, 30(5), 586-603.
- ix. Keen. P. G. W (1980). MIS research: Reference disciplines and a cumulative tradition. In E. R. McLean (Ed.), *Proceedings of First International Conference on Information Systems* (pp. 9-18).
- x. Kettinger, W.J., and Lee, C.C. Perceived service quality and user satisfaction with the information services function. *Decision Sciences*, 25, 5–6 (1995), 737–765.
- xi. King, J. L. & Rodriguez, E. L. (1978). Evaluating management information systems. *MIS Quarterly*, 2(3), 43-51.
- xii. Miller, J. & Doyle, B. A. (1987). Measuring the effectiveness of computer-based information systems in the financial services sector. *MIS Quarterly*, 11(1), 107-124.
- xiii. Miller, J. (1989). Information systems effectiveness: The fit between business needs and system capabilities. In J. I. Degross, J. Henderson & B. Konsynski (Eds), *Proceedings of Tenth International Conference on Information Systems* (pp. 273-288), Boston, Mass.
- xiv. Mugenda, O. & Mugenda, A. (1999). *Research methods; Quantitative and Qualitative Approaches*. Nairobi: Acts Press.
- xv. Mugenda, O. & Mugenda, A. (2003). *Research methods quantitative and qualitative approaches*. Nairobi. Acts Press
- xvi. Nelson, R.R., Todd, P.A., Wixom, B.H., 2005. Antecedents of information and system quality: an empirical examination within the context of data warehousing. *Journal of Management Information Systems* 21, 199–235.
- xvii. Seddon, P.B., 1997. A specification and extension of the DeLone and McLean model of SMIS success. *Information Systems Research* 240, 240–253.
- xviii. Sedera, D., Gable, G., 2004. A factor and structural equation analysis of the enterprise systems success measurement model. In: Appelgate, L., Galliers, R., DeGross, J.I. (Eds.), *Proceedings of the Twenty-Fifth International Conference on Information Systems*. Association for Information Systems, Washington, DC, USA, p. 449.