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School Managers' Efficacy as a Determinant of Educational Management Information Systems Utilisation in Public Senior Schools in Nakuru County, Kenya

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Abstract

This article examines the influence of school managers' efficacy on the utilisation of Educational Management Information Systems (EMIS) in public senior schools in Nakuru County, Kenya. Guided by Social Cognitive Theory, the study employed a convergent parallel mixed-methods design. A total of 62 principals, 191 deputy principals and 191 class teachers were sampled. After data cleaning, the usable questionnaire responses that entered analysis were 62 principals, 152 deputy principals and 157 class teachers. In addition, the County Director of Education, 11 Sub-County Directors of Education and selected principals participated as key informants in the qualitative strand. Additionally, Interviews were conducted with one County Director of Education, 11 Sub-County Directors of Education and 62 principals. Regression analysis used data from 152 deputy principals because their responses provided complete data for the predictor and outcome variables used in the regression analysis. Quantitative data were analysed using descriptive statistics and simple linear regression, while qualitative data were analysed thematically using Braun and Clarke's six-phase approach. The findings were integrated at the interpretation stage. School managers' efficacy significantly predicted EMIS utilisation, $F(1, 150) = 97.87$, $p < .001$, explaining 39.5 per cent of the variance ($\beta = 0.628$). Interview findings revealed that initial training lasted one day, systematic refresher training was lacking, and knowledge of the system was concentrated among a few individuals. The study concludes that efficacy is a significant determinant of EMIS utilisation and recommends continuous, practical, school-based capacity building and reliable technical support to strengthen school managers' competence and confidence in using EMIS.

Keywords: Educational Management Information System, Kenya, Nakuru County, NEMIS, school managers' efficacy, EMIS utilisation.

1.0 INTRODUCTION

The term Education Management Information Systems (EMIS) refers to software systems which are web-based and used to gather, manipulate and disseminate information for educational planning, monitoring and decision-making purposes. They are utilised by governments and educational institutions to provide information to support policy formation, resource allocation and quality improvement (Asio et al., 2022). The effectiveness of such a system will rely on the regularity and effectiveness of how the individuals who should be using school data to make decisions do so.

In the context of this study, EMIS utilisation in public senior schools refers to the regular, accurate and purposeful application of EMIS by school managers in carrying out key management activities. The functions include timely and accurate entry, verification and updating of learner, staff and school data; generation and retrieval of reports for planning purposes and for submission to education authorities; the ability to use EMIS data to inform decisions with regard to resource allocation, learner placement and academic support; and integration of the system into routine administration. Effective use is not the same as nominal use or compliance data entry, and involves managers in using the system effectively, confidently and regularly. It is important for school management, as the timely and accurate data from EMIS helps provide transparency, accountability and evidence-based decision-making at school and national level.

The National Education Management Information System (NEMIS) was launched in January 2018 as an online platform by the Ministry of Education in Kenya to gather accurate information about learning institutions and learners (Staff Writer, 2018). Wamutoro et al. (2022) found that secondary schools in Kenya found manual management of student records to be difficult and cumbersome, leading to the government's adoption of a policy to promote the use of EMIS. Other studies in Kenya have focused on the use of EMIS in the tracking of students' records (Kosgei et al., 2022) and managing public secondary schools (Wamutoro et al., 2022).

The efficacy of school managers in this study is measured as the trust and competence of school managers in their activities related to EMIS. The Social Cognitive Theory (SCT) concept of self-efficacy is defined as the confidence that one has in their ability to plan and execute the actions needed to achieve a desired result (Bandura, 1977, 1986). A manager who doubts their ability to enter, verify or retrieve data is expected to use the system less routinely, even where the technology is available. Efficacy is therefore a plausible determinant of EMIS utilisation, and it is the focus of this study.

Previous work on EMIS in Kenya and the region has concentrated on how the system is implemented and used, and on the problems encountered, rather than on the efficacy of the people who operate it. Three gaps follow. The first is geographical: the Kenyan studies reviewed for this study were conducted in Uasin Gishu County (Kosgei et al., 2022; Wamutoro et al., 2022), and the authors identified little evidence on the determinants of EMIS utilisation among school managers in public senior schools in Nakuru County. Limited empirical evidence was identified on the statistical relationship between ICT infrastructure and EMIS utilisation among school managers across public senior schools in Nakuru County. The second is conceptual: existing studies examine EMIS use, effectiveness, or implementation, and few measure EMIS-specific efficacy alongside EMIS utilisation. The third is empirical: the studies reviewed rely mainly on descriptive surveys, small qualitative samples or single-method designs, which limits the depth with which

efficacy can be explained. This study addresses these gaps with a convergent parallel mixed-methods study of school managers' efficacy and EMIS utilisation in public senior schools in Nakuru County. This study reports one component of a wider study that examined ICT infrastructure, school managers' efficacy and school managers' attitudes as determinants of EMIS utilisation.

The objective of the study was to examine the relationship between school managers' efficacy and EMIS utilisation in public senior schools in Nakuru County, Kenya. The research question was: What is the relationship between school managers' efficacy and EMIS utilisation in public senior schools in Nakuru County, Kenya?

2.0 LITERATURE REVIEW

The review is organised around the constructs of the study, namely self-efficacy, training and the sources of efficacy, technical support, and actual use of EMIS. It ends with a synthesis of what is established, what remains unknown and how the present study responds.

Self-Efficacy and Technology-Related Behaviour

Röhl et al. (2024) examined a repeated-measurement survey of 493 school leaders from Germany, collected prior to and in the middle of the first school closure related to the COVID-19 pandemic. Results of the structural equation analysis indicated that the level of self-efficacy of the leaders significantly affected the breadth and depth of innovations that were implemented in their schools during the crisis, while leadership experience and school size did not significantly affect the innovation. This research did not investigate EMIS or overall ICT competence, and the results were not about the use of the system in a routine manner but about innovation during crisis situations. Shen et al. (2024) have studied perceived school support and ICT self-efficacy, which mediated between technology integration and acted as a partial mediator between perceived school support and technology integration in their study of teachers.

Training and the Sources of Efficacy

Syvertsen et al. (2025) surveyed 405 school leaders in Germany and found, using structural equation models, that mastery experience, vicarious experience and emotional states influenced school leaders' innovation-related self-efficacy. They concluded that preparation programmes that let participants practise work-related tasks and experience mastery are valuable. This finding is consistent with Bandura's (1977) account of the sources of efficacy, and it suggests that the form of training offered to EMIS users matters as well as its availability.

EMIS Use and Support in Kenya and the Region

Studies of EMIS in Kenya and Tanzania describe how the system is used and where difficulties arise. Kosgei et al. (2022) used a cross-sectional survey of 594 participants in Turbo Sub-County. They reported that EMIS was used to track student records and to send academic results to parents, with descriptive statistics as the main analysis. Wamutoro et al. (2022) examined EMIS for student information management in Uasin Gishu County and reported a significant relationship between EMIS and the management of public secondary schools in a regression analysis. In Tanzania, Nkata and Dida (2020) collected interview and questionnaire data in the Arusha region. They concluded that secondary schools needed a centralised EMIS because manual systems limited the integrity and timeliness of information. Mbawala et al. (2024) used structured interviews with five principals to examine how EMIS is used in school management.

Critical Synthesis

The reviewed studies differ in design, outcome and applicability. The two studies of school leaders' self-efficacy (Röhl et al., 2024; Syvertsen et al., 2025) use large samples and structural equation modelling, but they were conducted in Germany, did not measure EMIS use, and addressed innovation-related self-efficacy. The study of teachers (Shen et al., 2024) links ICT self-efficacy and school support to technology integration in teaching, which is a different task from administrative data management. The Kenyan and Tanzanian EMIS studies concern the system itself. Kosgei et al. (2022) relied on descriptive statistics, Wamutoro et al. (2022) related EMIS effectiveness to school management without isolating efficacy, and the Tanzanian studies were small or framework-oriented (Mbawala et al., 2024; Nkata & Dida, 2020). Taken together, the studies point to the relevance of user capability and support, but they cannot be compared directly because the outcome constructs differ: innovation, technology integration, record tracking and school management effectiveness. Differences in country, school level and design further limit how far results transfer to public senior schools in Nakuru County.

Summary of the Literature and Contribution of the Present Study

Previous studies have established that self-efficacy is associated with how leaders and teachers respond to new demands, that training and mastery experiences shape efficacy, and that EMIS supports record keeping and school management. What remains unknown is how EMIS-specific efficacy relates to EMIS utilisation among school managers in public senior schools in Nakuru County, and whether the training and support that managers receive explain their level of efficacy. The present study addresses this gap by measuring EMIS-specific efficacy and EMIS utilisation in the same sample and by using interviews to explain the quantitative results.

Theoretical and Conceptual Framework

Social Cognitive Theory

Social Cognitive Theory (SCT) was developed by Bandura (1986) to explain human action through the reciprocal influence of personal, environmental and behavioural factors. Self-efficacy is a central concept of the theory. Bandura (1977) identified four sources of efficacy beliefs: mastery experiences, vicarious experiences, verbal persuasion, and physiological and emotional states. In the context of EMIS, efficacy refers to a manager's confidence in entering, retrieving, verifying and interpreting data, producing reports and resolving basic technical problems. The environmental dimension of SCT is reflected in conditions such as ICT infrastructure, which can enable or restrict the use of skills that a manager already has.

Technology Acceptance Model and TAM2

Davis (1989) introduced the Technology Acceptance Model (TAM), which proposes that perceived usefulness and perceived ease of use shape users' attitudes, their intention to use technology and their actual use. Venkatesh and Davis (2000) extended this model as TAM2 by adding social influence processes and cognitive instrumental processes, such as job relevance and output quality, to explain perceived usefulness and usage intention. TAM and TAM2 are therefore distinct models, and the extended model is attributed to Venkatesh and Davis (2000).

Roles of the Two Theories in This Study

SCT is the primary theoretical framework of this study. It guided the definition and measurement of efficacy, the hypothesis and the analysis. TAM2 provides supplementary context only. It informs the

interpretation of school managers' attitudes. The two theories were therefore not used as parallel frameworks to guide the analysis reported in this study.

Conceptual Framework

Figure 1 shows the variables and the hypothesised relationship. The dependent variable is EMIS utilisation, defined in this study as the frequency, timeliness, accuracy and purposefulness with which school managers use EMIS to achieve school management goals. The independent variable is school managers' efficacy, which is the confidence and capability of managers in using EMIS.

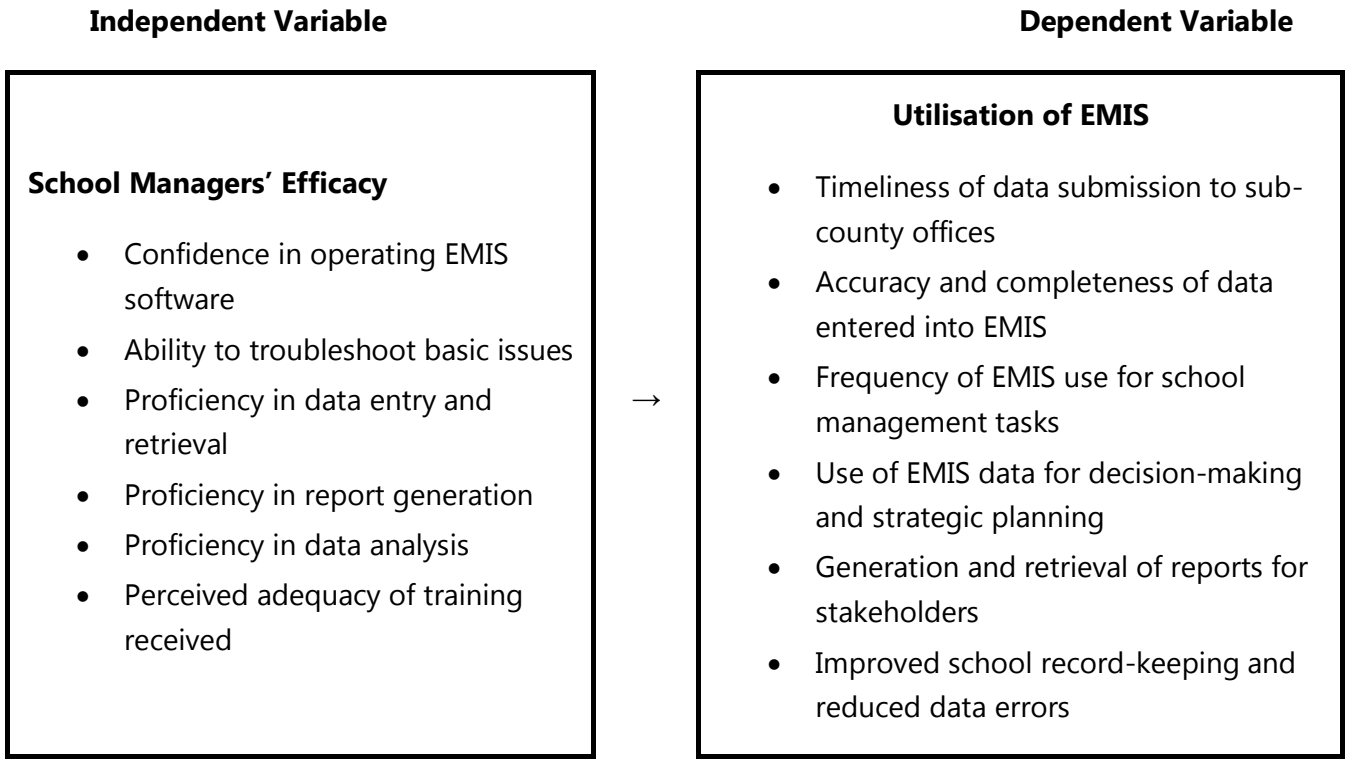

Figure 1: Conceptual Framework of the Study

3.0 METHODOLOGY

Research Design

The study used a convergent parallel mixed-methods design (Creswell & Creswell, 2023; Creswell & Plano Clark, 2017). Quantitative and qualitative data were collected during the same data-collection period, and each data set was analysed independently with its own procedures. The findings were then merged at the interpretation stage and compared for similarities, differences and complementarity (Creswell & Plano Clark, 2017).

Location of the Study

The study was carried out in Nakuru County, Kenya. The county had a population of 2,162,202 in the 2019 Kenya Population and Housing Census (Kenya National Bureau of Statistics, 2019) and was the third most populous county in the country. It borders Baringo, Laikipia, Nyandarua, Kiambu, Narok, Kajiado, Bomet and Kericho counties. Nakuru County has eleven sub-counties: Kuresoi North, Kuresoi South, Njoro, Gilgil, Molo, Nakuru North, Rongai, Subukia, Nakuru East, Nakuru West and Naivasha.

Target Population, Accessible Population and Unit of Analysis

The target population comprised all public senior schools in Kenya, their school managers (principals, deputy principals and class teachers), and the county and sub-county directors of education, who are directly involved in the generation, management, supervision and utilisation of educational data. Because of practical constraints and the contextual focus of the study, the accessible population was limited to Nakuru County. It comprised 384 public senior schools, 384 principals, 394 deputy principals, 768 class teachers, one County Director of Education and 11 Sub-County Directors of Education, a total of 1,558 individuals. The unit of analysis for the quantitative component was the individual school manager (principal, deputy principal or class teacher) who completed the questionnaire. The unit of analysis for the qualitative component was the individual interviewee.

Sampling Procedure and Sample Size

Sample size determination

The sample sizes were first determined using Nassiuma's (2000) formula with a coefficient of variation of 0.30 and a standard error of 0.02. This yielded calculated samples of 142 principals, 144 deputy principals and 174 class teachers.

In line with Mugenda and Mugenda (2003), the samples of deputy principals and class teachers were increased by 25 per cent to 191 each to allow for non-response.

For principals, practical field constraints (geographical spread of schools, limited data-collection period, and principals' administrative schedules) made it unfeasible to reach the full calculated sample of 142. Consequently, 62 principals were sampled. All 62 completed the questionnaire fully (100% response rate). These 62 principals also served as key informants for the qualitative interviews.

The final usable questionnaire samples that entered analysis were therefore 62 principals, 152 deputy principals and 157 class teachers. The County Director of Education and the 11 Sub-County Directors of Education were purposively selected as key informants.

Sampling technique, sampling frame and selection procedure

Stratified random sampling and purposive sampling were used, depending on the category of respondent. The sampling frame was the list of the 384 public senior schools in Nakuru County. Schools were classified into the four categories used in Kenya (national, extra-county, county and sub-county), and a random sample of schools was drawn from each category so that all four categories were represented. Within each sampled school, the deputy principal was included as a questionnaire respondent, and one class teacher was randomly picked from the Form Three class teachers. Principals in all 191 sampled schools were also targeted as questionnaire respondents. However, because of their administrative schedules, the geographical spread of schools and the limited data-collection period, only 62 principals were successfully reached. All 62 completed usable questionnaires. The County Director of Education, the 11 Sub-County Directors of Education and the 62 principals were included in the qualitative strand as key informants.

Achieved sample

Table 1 shows the calculated, issued and usable samples. In total, 444 questionnaires were issued, and 371 were usable, an overall response rate of 83.56 per cent. The response rate was 100 per cent for principals (62 of 62), 79.58 per cent for deputy principals (152 of 191) and 82.20 per cent for class teachers (157 of

191). Of the 191 questionnaires issued to deputy principals, 152 were usable after data cleaning, and these 152 formed the analysis sample for the efficacy regression. Of the 191 principals targeted, 62 were reached and all 62 completed usable questionnaires. Relative to the calculated sample of 142, the 62 principals represent 43.7 per cent, and relative to the 191 principals targeted, they represent 32.5 per cent. The high response rates among deputy principals and class teachers reduce the risk of nonresponse bias, although they do not remove it.

Table 1: Calculated, Issued and Usable Samples by Respondent Category

Respondent category	Calculated sample (Nassiuma, 2000)	Questionnaires issued	Usable questionnaires	Response rate (%)	Role in qualitative strand
Principals	142	62	62	100.00	62 principals interviewed as key informants
Deputy principals	143	191	152	79.58	Questionnaire only
Class teachers	174	191	157	82.20	Questionnaire only
Total (questionnaires)	**459**	**444**	**371**	**83.56**	**-**
County Director of Education	Purposive	1	Not applicable	Not applicable	Key informant
Sub-County Directors of Education	Purposive	11	Not applicable	Not applicable	Key informants

Note. Calculated samples were derived with Nassiuma's (2000) formula (C = 0.30, e = 0.02). Deputy principal and class teacher samples were increased to 191 each to allow for nonresponse (Mugenda & Mugenda, 2003). Principals in all 191 sampled schools were targeted; 62 were reached and all 62 completed usable questionnaires. The 191 deputy principals and 191 class teachers were drawn from the same 191 sampled schools.

Instruments

Questionnaires and interview schedules were the primary instruments. Three questionnaires were administered, one each to class teachers, deputy principals and principals, and three interview schedules were used for the County Director of Education, the Sub-County Directors of Education and principals. The questionnaire responses comprised 62 principals, 152 deputy principals and 157 class teachers. Responses on the efficacy and utilisation scales were recorded on a five-point scale from 1 (strongly disagree) to 5 (strongly agree). The efficacy composite used in the regression comprised 13 items, and six of these items are reported in Table 2. EMIS utilisation was measured with a separate section of the questionnaire and analysed as a composite mean score.

Interviews were held with 74 key informants: the County Director of Education, all 11 Sub-County Directors of Education and 62 principals. Quotations reported in the results were selected to illustrate

each sub-theme and are identified by anonymised codes: P for principal, SCDE for Sub-County Director of Education and CDE for County Director of Education.

Validity and Reliability

Validity is the degree to which an instrument measures what it claims to measure (Cooper & Schindler, 2013). Content, construct and face validity were examined. Experts and the university supervisors reviewed the instruments to confirm that the items were relevant to the objectives of the study (Sigei, 2022). A pretest in five schools outside the study area was used to check the clarity, suitability and reliability of the instruments. Reliability was assessed with Cronbach's alpha calculated from the pretest data, and a coefficient above 0.70 was taken as acceptable (Kothari & Garg, 2014). The coefficient for the efficacy scale was 0.856. The coefficients for ICT infrastructure and attitudes, which were examined in the study, were 0.877 and 0.844.

Data Collection Procedure and Ethical Considerations

Ethical approval was obtained from the Kabarak University Research Ethics Committee. A research permit was then obtained from the National Council for Science, Technology and Innovation (NACOSTI). The researcher obtained an introductory letter from the Nakuru County Director of Education and requested permission to carry out the study in public senior schools in the county. The permit and an explanatory letter were presented to principals to obtain approval and to inform them about the study. All participants received consent forms before data collection. Participation was voluntary, and participants could withdraw at any time without penalty.

Data from the interviews were captured through systematic note-taking by the researcher using an interview guide and an interview recording notebook. The notes documented participants' responses, key explanations, examples and emerging issues relating to ICT infrastructure and EMIS utilisation. Particular attention was given to responses concerning computer hardware, electricity supply, internet connectivity and disparities in ICT infrastructure across schools. Since the interviews were not audio-recorded, the researcher took detailed notes during the interviews.

Data Analysis

Quantitative data were analysed with descriptive statistics (frequencies, percentages, means and standard deviations) and inferential statistics (Pearson correlation and simple linear regression). The regression used the efficacy composite mean score as the predictor and the utilisation composite mean score as the outcome. The regression was estimated using data from 152 deputy principals because their responses provided complete data for the predictor and outcome variables used in the regression analysis. Statistical significance was judged at the 0.05 level, and effect size was expressed as Cohen's f^2 (Cohen, 1988). The regression model was $Y = \beta_0 + \beta_1 X + \varepsilon$, where Y is EMIS utilisation, X is school managers' efficacy, β_0 is the constant, β_1 is the slope coefficient, and ε is the error term. Thematic analysis of the interview data followed the six phases of Braun and Clarke (2006) and was carried out in NVivo, and themes were organised according to the study objectives.

4.0 FINDINGS AND DISCUSSION

Characteristics of the Participants

Demographic information was collected on age, gender and teaching experience. Among class teachers (*n* = 157), 49.7 per cent were aged 25 to 34 years and 40.1 per cent were aged 35 to 44 years. Male teachers made up 61.1 per cent of class teachers and female teachers 38.9 per cent. Regarding teaching experience, 43.9 per cent had between one and five years, and 29.9 per cent had between six and ten years.

Among deputy principals (*n* = 152), 51.3 per cent were male, and 48.7 per cent were female. Most (69.7%) were aged 45 to 54 years, 21.1 per cent were aged 35 to 44 years, and 2.0 per cent were under 35 years. The remaining 7.2 per cent were in other age categories. Regarding teaching experience, 49.3 per cent had more than 15 years, 43.4 per cent had 11 to 15 years, and 7.2 per cent had six to ten years.

Among principals (*n* = 62), 56.5 per cent were male, and 43.5 per cent were female. Most (58.1%) were aged 45 to 54 years, 37.1 per cent were aged 55 years and above, and 4.8 per cent were aged 35 to 44 years. A total of 85.5 per cent had more than 15 years of teaching experience, and 14.5 per cent had between 11 and 15 years.

Descriptive Statistics: School Managers' Efficacy

Deputy principals responded to statements on their ability to use EMIS, and Table 2 presents six of these statements. Data came from 152 deputy principals. Mean scores ranged from 2.64 to 3.30 on the five-point scale, and only two items had means above the scale midpoint of 3.00: entering and retrieving data accurately (3.30) and using EMIS comfortably (3.02).

Table 2: Deputy Principals' Responses on School Managers' Efficacy in Using EMIS (n = 152)

Statement	Strongly disagree (1)	Disagree (2)	Neutral (3)	Agree (4)	Strongly agree (5)	*M*	*SD*
I can use EMIS comfortably	10 (6.6%)	38 (25.0%)	56 (36.8%)	35 (23.0%)	13 (8.6%)	3.02	1.05
I am proficient in using EMIS for report generation	22 (14.5%)	37 (24.3%)	45 (29.6%)	30 (19.7%)	18 (11.8%)	2.90	1.22
I have received sufficient training on the use of EMIS	20 (13.2%)	50 (32.9%)	51 (33.6%)	23 (15.1%)	8 (5.3%)	2.66	1.05
I personally use EMIS without any assistance	28 (18.4%)	44 (28.9%)	46 (30.3%)	22 (14.5%)	12 (7.9%)	2.64	1.17
I can independently troubleshoot basic EMIS system issues	18 (11.8%)	40 (26.3%)	49 (32.2%)	31 (20.4%)	14 (9.2%)	2.89	1.14
I can enter and retrieve data accurately using EMIS	6 (3.9%)	28 (18.4%)	52 (34.2%)	46 (30.3%)	20 (13.2%)	3.30	1.04

Note.*n* = 152. *M* = mean; *SD* = standard deviation. Entries in the response columns are frequencies with row percentages in parentheses. Percentages may not sum to 100 because of rounding.

Deputy principals showed limited confidence in their EMIS skills. The statement on entering and retrieving data accurately had the highest mean (3.30), yet fewer than half of the deputy principals agreed or strongly agreed with it (66 of 152, 43.4%). Agreement was lower on comfortable use (48, 31.6%), report generation (48, 31.6%), troubleshooting (45, 29.6%) and using EMIS without assistance (34, 22.4%). The item on training had a mean of 2.66, and 31 deputy principals (20.4%) agreed or strongly agreed that they had received sufficient training.

Inferential Statistics: Regression Analysis for Efficacy

A simple linear regression was conducted using the efficacy composite mean score as the predictor of EMIS utilisation. Table 3 presents the results. The model was statistically significant, $F(1, 150) = 97.87$, $p < .001$. The Pearson correlation between efficacy and utilisation was $r = 0.628$, which equals R in a simple regression. The R^2 of 0.395 indicates that efficacy accounted for 39.5 per cent of the variance in EMIS utilisation, and the adjusted R^2 of 0.391 indicates that the model would explain about 39.1 per cent of the variance in the population.

Table 3: Simple Linear Regression of EMIS Utilisation on School Managers' Efficacy (n = 152)

Component	Statistic	Value
Model fit	*R*	0.628
	R^2	0.395
	Adjusted R^2	0.391
	Standard error of the estimate	0.53866
ANOVA	Regression sum of squares (df = 1)	28.399
	Residual sum of squares (df = 150)	43.524
	Total sum of squares (df = 151)	71.923
	Residual mean square	0.290
	F	97.872
	p	< .001
Constant	Unstandardised *B* (*SE*)	-0.191 (0.381)
	t, *p*	-0.502, .617
	95% CI	-0.943 to 0.561
Efficacy composite (13 items)	Unstandardised *B* (*SE*)	1.231 (0.124)
	Standardised β	0.628
	t, *p*	9.893, < .001
	95% CI	0.985 to 1.477

Note. Predictor: efficacy composite mean score (13 items). Dependent variable: EMIS utilisation composite mean score. *B* = unstandardised coefficient; *SE* = standard error; CI = confidence interval.

The estimated regression equation was $Y = -0.191 + 1.231X$. The slope ($B = 1.231$, $p < .001$) indicates that a one-unit higher efficacy composite score was associated with a 1.231-unit higher utilisation score, and the 95% confidence interval for the slope ranged from 0.985 to 1.477. The standardised coefficient of 0.628 ($p < .001$) indicates that a difference of one standard deviation in efficacy was associated with a difference of 0.628 standard deviations in utilisation. Cohen's f^2 was calculated as $R^2 / (1 - R^2) = 0.395 / 0.605 = 0.653$, which is a large effect according to the conventions of Cohen (1988). H1 was therefore supported. In the wider study, ICT infrastructure explained 34.4 per cent of the variance in EMIS utilisation ($f^2 = 0.524$),

school managers' attitudes explained 24.3 per cent, and the three determinants jointly explained 59.0 per cent, with efficacy as the strongest predictor (Kiprono, 2026).

Qualitative Findings: Managerial Efficacy and Training

The interview data produced five sub-themes on managerial efficacy and training: adequacy of initial training, availability of refresher training, confidence levels, troubleshooting ability and self-directed learning.

Adequacy of initial training

Interviewees reported that initial EMIS training was inadequate in duration, depth and follow-up. A principal from a county school described his experience:

> *When EMIS was introduced through NEMIS, we were given a one-day training session at the sub-county headquarters. That was it. One day. For a system that requires us to manage student enrolment, examinations, staff records and financial data. I learned some basics, but I'm not confident in troubleshooting and using the more advanced features. (P-ML-02)*

Availability of refresher training

Interviewees reported that refresher training was rarely provided. The County Director of Education acknowledged the gap:

> *We have tried to organise refresher training sessions, but funding is a constraint. The national government provided initial training when NEMIS was rolled out in 2018, but there has been no systematic budget for continuous professional development on EMIS since then. We rely on school-based mentorship and peer support, which is not always effective. (CDE-01)*

A Sub-County Director described the consequences of the absence of refresher training:

> *The teachers who attended the 2018 training have either left the school or forgotten what they learned. The teachers who joined after 2018 have received no training at all. They learn from colleagues who are themselves not confident. Errors propagate. Bad habits spread. The quality of data declines over time, not improves. (SCDE-RG-06)*

Confidence levels

Interviewees reported that confidence levels varied widely and were associated with age, prior ICT experience and access to ongoing support. A Sub-County Director provided this assessment:

> *Confidence levels vary widely. Some of our younger deputy principals came through teacher training programs that included ICT modules, and they are very comfortable with the system. But many of our older principals, and some of our class teachers who have been in the profession for decades, are genuinely fearful of technology. They worry about making mistakes that will cause problems with student records. (SCDE-NJ-03)*

Troubleshooting ability

Interviewees reported that troubleshooting ability was limited to a few individuals in each school, which created vulnerability when those individuals were unavailable. A Sub-County Director described this concentration of expertise:

> *In most schools, there is one person who knows EMIS. It is usually the deputy principal or the ICT teacher. If that person is absent or leaves the school, the school's EMIS performance collapses. I*

have seen schools go from perfect submissions to no submissions at all when the deputy principal was transferred. (SCDE-ML-05)

A principal from a national school described a more distributed arrangement:

We have an ICT teacher who not only teaches computer studies but also serves as our in-house EMIS champion. Any time someone has a problem, they go to him first. If he cannot solve it, he contacts the sub-county ICT officer. This system works well because most problems are solved at the school level within hours. We also have trained two other teachers as backups, so we are never without someone who knows the system. (P-NE-05)

Self-directed learning

Despite the gaps in formal training, some managers engaged in self-directed learning. A Sub-County Director described one example:

Some principals have taken it upon themselves to learn. I know a principal in my sub-county who watched YouTube tutorials and contacted the NEMIS helpdesk multiple times until he understood the system thoroughly. He now runs training sessions for his own staff. His school's data is always among the most accurate in the sub-county. So while we need more formal training, we also need managers to take ownership of their own learning. (SCDE-NW-08)

Integration of Quantitative and Qualitative Findings

Table 4 sets the two strands side by side. The questionnaire and interview findings converged on training, independent use and troubleshooting, and the interviews added explanation for the pattern of low efficacy and for the exceptions to it.

Table 4: Joint Display of Quantitative and Qualitative Findings on Efficacy

Area	Quantitative finding (deputy principals, n = 152)	Qualitative finding	Relationship
Training	20.4% agreed they had received sufficient training (*M* = 2.66)	Initial training lasted one day, and no systematic refresher training followed (P-ML-02; CDE-01; SCDE-RG-06)	Convergence
Independent use	22.4% agreed they used EMIS without assistance (*M* = 2.64)	Knowledge of the system was concentrated in one person per school (SCDE-ML-05)	Convergence
Troubleshooting	29.6% agreed they could troubleshoot basic issues (*M* = 2.89)	Troubleshooting was limited to a few individuals, and one school had trained backups (SCDE-ML-05; P-NE-05)	Convergence, with an exception
Data entry and retrieval	Highest mean (3.30); 43.4% agreed	Basic functions were learned, but advanced features and troubleshooting were not (P-ML-02)	Complementarity
Self-directed learning	No questionnaire item	Some managers learned independently and trained their own staff (SCDE-NW-08)	Complementarity
Effect of efficacy on utilisation	R^2 = 0.395; β = 0.628	Variation in confidence and training was described as shaping the quality of school data (SCDE-RG-06; SCDE-NW-08)	Convergence

Note. Percentages show agreement with the questionnaire statement. Participant codes identify the interviewee quoted in Section 5.4.

Discussion

The findings indicate that school managers' efficacy is a significant predictor of EMIS utilisation in public senior schools in Nakuru County. Efficacy accounted for 39.5 per cent of the variance in utilisation (R^2 = 0.395, β = 0.628, p < .001), with a large effect size (f^2 = 0.653). Because the design was cross-sectional, the result is an association and not proof that efficacy causes utilisation. In the wider study, efficacy was the strongest of the three determinants examined (Kiprono, 2026).

Before the present findings are compared with earlier studies, four related constructs need to be distinguished. Self-efficacy, as used here, is a manager's confidence and perceived capability to perform EMIS-related tasks, such as entering data, generating reports and troubleshooting (Bandura, 1977, 1986). EMIS utilisation is the frequency, timeliness, accuracy and purposefulness with which managers use the system. General ICT competence is the broader skill of using computers, software and digital devices, which may or may not translate into EMIS-specific proficiency. Managerial effectiveness is the overall achievement of school management goals, which EMIS use may influence but which is not the same as use. The studies reviewed measured different constructs. Röhl et al. (2024) and Syvertsen et al. (2025) examined leaders' innovation-related self-efficacy and did not measure EMIS use. Shen et al. (2024)

examined teachers' ICT self-efficacy in technology integration, which is closer to general ICT competence in a teaching context. Kosgei et al. (2022) described EMIS use for record tracking, and Wamutoro et al. (2022) related EMIS to the effectiveness of school management without isolating efficacy. The present study measured EMIS-specific efficacy and EMIS utilisation in the same sample, so it can speak to the relationship between these two constructs directly.

The result is consistent with Social Cognitive Theory, which holds that efficacy beliefs influence behaviour (Bandura, 1986), and with the direction of the findings of Röhl et al. (2024) and Shen et al. (2024) for other technology-related and innovation outcomes. The comparison should be read with caution because those studies used different outcomes, populations and countries.

The descriptive and interview results suggest how efficacy may be formed and limited. Syvertsen et al. (2025) identified mastery and vicarious experience as sources of school leaders' self-efficacy. In this study, interviewees described a single day of initial training and no systematic refresher training, which gives few opportunities for mastery experience. Deputy principals reported low agreement with the statements on sufficient training, independent use and troubleshooting. The interviews also described the concentration of EMIS knowledge in one person per school (SCDE-ML-05), which limits vicarious experience for other staff. The school that had trained backup staff (P-NE-05) and the principal who learned from tutorials and then trained colleagues (SCDE-NW-08) show that training opportunities and peer support can build efficacy. This reading is interpretive, because the study did not measure the sources of efficacy directly.

The integration of the two strands (Table 4) shows convergence on training, independent use and troubleshooting, and complementarity on data entry and self-directed learning. Managers reported most confidence in entering and retrieving data and less confidence in report generation, independent use and troubleshooting, which fits the interview account of learning the basics without mastering advanced features (P-ML-02).

Limitations

Several limitations apply. The design was cross-sectional, so the findings show association and not causation. Efficacy and utilisation were self-reported and may be affected by social desirability. The efficacy regression used the data of deputy principals (n = 152), and the findings may not apply to principals and class teachers. The number of principals (62) was lower than the calculated sample and represents 32.5 per cent of the 191 principals targeted, and response rates of deputy principals and class teachers were 79.58 and 82.20 per cent. The study was limited to one county. The questionnaire measured perceived sufficiency of training, and it did not measure participation in training in a given period.

5.0 CONCLUSION AND RECOMMENDATIONS

Conclusions: School managers' efficacy was a significant predictor of EMIS utilisation and explained 39.5 per cent of its variance among the deputy principals analysed. Deputy principals reported limited confidence in report generation, independent use and troubleshooting, and low agreement that they had received sufficient training. Interview participants described a one-day initial training at the launch of NEMIS in 2018, no systematic refresher training since then, and troubleshooting knowledge held by few individuals. The study therefore concludes that school managers' efficacy is a significant predictor of EMIS utilisation in public senior schools in Nakuru County and that the existing training provision is insufficient to build and sustain managers' competence and confidence.

Recommendations: First, the Ministry of Education should establish a continuing programme of professional development in EMIS for school managers. The programme should go beyond one-day training and include regular refresher courses, hands-on practice sessions and mentorship in which confident users support less confident colleagues. Second, each school should develop at least one internal EMIS champion and a trained backup, so that the school's EMIS performance does not depend on one person, as the interviews showed. Third, education offices should strengthen technical support at sub-county level so that school managers have a first point of contact when problems arise.

Future research should examine the relationship between EMIS utilisation and student learning outcomes, because this study examined the determinants of EMIS use and not its effect on educational quality. A longitudinal study that follows the same schools over two or three years and measures EMIS use before and after training interventions would give clearer evidence on causal relationships. Comparative studies across counties would show whether the findings from Nakuru County apply in settings with different infrastructure, training provision and socio-economic conditions. Studies that analyse the efficacy of principals and class teachers, and that measure the sources of efficacy directly, would extend the present findings.

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