

Design And Implementation Of A Students' Registration System: A Case Study Of Mbogo High School

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Abstract

The management of student records, including admission details, class allocation, and biodata, remains a largely manual and error-prone process in many Ugandan secondary schools, creating administrative inefficiencies that a dedicated, purpose-built students' registration system can help address. This study focused on the design and implementation of a students' registration system for Mbogo High School, guided by objectives that sought to analyze the existing manual registration process and gather user requirements, design and develop a computerized students' registration system addressing the identified requirements, implement and test the system, and evaluate user acceptance and satisfaction with the developed system. The study adopted the Rapid Application Development methodology, comprising requirements analysis, prototyping, iterative development, and user testing, complemented by a descriptive evaluation survey administered to system users following implementation. The developed system, built using a web-based architecture with a relational database backend, provided modules for new student admission, class and stream allocation, student biodata management, and searchable record retrieval. System evaluation data were collected from a sample of 52 respondents comprising administrative staff, class teachers, and the school bursar who used the system during a one-term piloting period, and were analyzed using descriptive statistics, Pearson correlation, multiple regression, and path analysis (AMOS) grounded in the Technology Acceptance Model. Results showed high perceived ease of use (mean = 3.91) and high perceived usefulness (mean = 3.87) of the developed system, with both constructs significantly and positively correlated with user satisfaction ($r = 0.612$ and $r = 0.671$ respectively, $p < 0.01$). Regression analysis showed that perceived usefulness and perceived ease of use jointly explained 48.3 percent of the variance in user satisfaction ($R^2 = 0.483$). Path analysis revealed that perceived usefulness significantly mediates the relationship between perceived ease of use and user satisfaction, with a significant indirect effect ($\beta = 0.224$, $p < 0.01$) alongside a significant direct effect ($\beta = 0.291$, $p < 0.01$), yielding a total effect of 0.515. The study concludes that the developed students' registration system was well received by users at Mbogo High School, substantially reducing the time and errors associated with the previous manual registration process, and recommends full-scale rollout, staff training, and periodic backup and system maintenance procedures.

Keywords: Students' registration system, system design and implementation, Technology Acceptance Model, user satisfaction, secondary schools, path analysis, Mbogo High School

INTRODUCTION

The registration and management of student records constitutes a foundational administrative function in any secondary school, encompassing the capture of new student admission details, allocation of students to classes and streams, maintenance of biodata and academic records, and the ability to retrieve such records efficiently when needed for administrative, academic, or disciplinary purposes (Anthony et al., 2023). In many Ugandan secondary schools,

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including Mbogo High School, this function has traditionally been performed through manual, paper-based processes involving physical admission forms, handwritten class registers, and filed student records, an approach that, while functional for schools with smaller student populations, becomes increasingly inefficient, error-prone, and difficult to manage consistently as student enrollment grows and as the volume of records requiring periodic retrieval and updating increases (Mark et al., 2023). Mbogo High School, a secondary school that has experienced steady enrollment growth in recent years, identified a need for a computerized students' registration system capable of streamlining the admission process, ensuring accurate and consistent record-keeping, and enabling rapid retrieval of student information, functions that had become increasingly cumbersome to manage through the school's existing manual system, particularly during the peak admission period at the start of each academic year.

This study is therefore centered on the systematic design and implementation of a purpose-built students' registration system for Mbogo High School, addressing the specific requirements identified through consultation with the school's administrative staff, class teachers, and bursar, and following a structured system development methodology intended to ensure that the resulting system is both technically sound and genuinely responsive to the practical needs of its intended users (Godfrey et al., 2023). Beyond the technical development process itself, this study places particular emphasis on the empirical evaluation of the developed system's acceptance and usability among its actual users following a piloting period, recognizing that the ultimate success of any custom-built administrative system depends not merely on its technical functionality but on the extent to which its intended users, most of whom had prior experience only with manual record-keeping processes, perceive it as both useful and easy to use (Kaazara & Audrey, 2025).

PROBLEM STATEMENT

Prior to this study, Mbogo High School relied entirely on manual, paper-based processes for student registration, including handwritten admission forms, physical class registers, and paper-filed student records, an arrangement that school administrators had identified as time-consuming, prone to data entry errors and duplication, vulnerable to loss or damage of physical records, and increasingly difficult to manage consistently as the school's student population grew, particularly during the high-volume admission period at the beginning of each academic year when administrative staff were required to process a large number of new student registrations within a short timeframe (Julius et al., 2026). While the school's administration recognized the potential benefits of adopting a dedicated computerized registration system to address these inefficiencies, there was, prior to this study, no existing system tailored to the school's specific registration workflow, and the school lacked in-house technical capacity to independently design and develop such a system (Audrey & Nancy, 2026). Moreover, there was no existing evidence on whether such a system, once implemented, would be genuinely accepted and found useful and easy to use by the school's administrative staff, most of whom had limited prior exposure to computerized record-management systems,

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information that was essential for informing decisions about system refinement and eventual full-scale adoption beyond an initial pilot phase. This study addresses this gap by undertaking the systematic design, development, implementation, and empirical evaluation of a purpose-built students' registration system for Mbogo High School.

Main Objective

The main objective of this study is to design and implement a students' registration system for Mbogo High School and to evaluate its acceptance and usability among its intended users.

Specific Objectives

The study is guided by the following specific objectives: to analyze the existing manual student registration process at Mbogo High School and gather user requirements for a computerized system; to design and develop a students' registration system addressing the identified requirements, incorporating modules for new student admission, class and stream allocation, student biodata management, and searchable record retrieval; to implement and test the developed system through a structured piloting period involving actual school administrative users; and to evaluate user acceptance and satisfaction with the developed system, examining the relationship between perceived usefulness, perceived ease of use, and overall user satisfaction.

LITERATURE REVIEW

This study is grounded theoretically in the Technology Acceptance Model, which proposes that an individual's acceptance and use of an information system is primarily determined by perceived usefulness and perceived ease of use, with perceived ease of use theorized to influence user satisfaction and continued use both directly and indirectly through its effect on perceived usefulness, a framework particularly relevant to administrative staff transitioning from manual to computerized record-keeping systems, for whom the perceived effort required to learn and operate a new system is likely to weigh heavily on their overall acceptance (Julius & Kazaara, 2025). This theoretical model is complemented by the Systems Development Life Cycle framework, and specifically the Rapid Application Development variant adopted in this study, which emphasizes iterative prototyping and close user involvement throughout the development process, an approach considered particularly well suited to administrative systems such as student registration systems where the specific workflow requirements are best captured through direct, ongoing consultation with the administrative staff who will use the system daily (Julius, 2024). The DeLone and McLean Information Systems Success Model further contributes to this study's theoretical framing by proposing that system and information quality jointly influence user satisfaction, which in turn influences the realization of net benefits from system use, such as reduced administrative processing time and improved data accuracy (Nguyen et al., 2024).

Empirical studies on the design and implementation of computerized student records and registration systems in African secondary school contexts have generally documented substantial administrative efficiency gains following the transition from manual to computerized systems, including significant reductions in the time required to process

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new admissions and retrieve student records, alongside improvements in data accuracy and reduced incidence of duplicate or lost records(Petersen et al., 2020). Studies applying the Technology Acceptance Model specifically to administrative information systems in school contexts have consistently found strong positive relationships between perceived ease of use, perceived usefulness, and user satisfaction, with several studies specifically confirming the mediating role of perceived usefulness in this relationship, particularly among administrative staff with limited prior exposure to computerized systems, for whom initial ease of use experiences strongly shape their subsequent judgments of the system's overall value(Joshua et al., 2026). Within the Ugandan secondary education context, a growing body of literature documenting locally developed school administrative systems has similarly found that user acceptance among non-technical administrative staff is strongly shaped by the system's perceived ease of use, with systems featuring simple, intuitive interfaces and clear alignment with existing administrative workflows achieving markedly higher acceptance than systems requiring substantial retraining or workflow disruption(Audrey & Nancy, 2026). This body of literature collectively underscores both the methodological importance of participatory, iterative system development and the centrality of the Technology Acceptance Model constructs in evaluating the ultimate success of such systems, providing the combined development and evaluation framework applied in the present study.

METHODOLOGY

This study adopted a combined system development and descriptive evaluation research design(Nafiu et al., 2017). For the system development component, the Rapid Application Development methodology was employed, comprising four key phases: requirements planning, in which user requirements were gathered through structured interviews and a focus group discussion with the school's administrative staff, bursar, and a sample of six class teachers; system design, in which the requirements gathered were translated into system architecture diagrams, database entity-relationship models, and user interface wireframes; iterative construction, in which the system was developed using a web-based architecture with HTML, CSS(Jallow et al., 2022), and JavaScript for the front end, a PHP-based server-side scripting framework for application logic, and a MySQL relational database for data storage, with development proceeding through successive prototype iterations reviewed and refined based on feedback from a core group of user representatives; and cutover, in which the completed system was deployed on the school's local server infrastructure and made available for piloting.

Following system development, a structured piloting period of one academic term was conducted, during which the system was made available for use by administrative staff for new student admission processing, by class teachers for viewing and updating class allocation and biodata records, and by the bursar for cross-referencing student records against fee payment status. At the conclusion of the piloting period, a descriptive evaluation survey was administered to assess user acceptance and satisfaction, grounded in the Technology Acceptance Model constructs of perceived usefulness, perceived ease of use, and overall user satisfaction(Sarah et al., 2024). The target population for this

evaluation comprised all administrative staff, class teachers, and the bursar who had actively used the system during the piloting period, from which a sample of 52 respondents was drawn using total population sampling given the manageable size of the eligible user population(Jallow et al., 2022). Data collection was conducted using structured questionnaires containing five-point Likert-scale items measuring perceived usefulness, perceived ease of use, and user satisfaction, complemented by open-ended items capturing specific user feedback and suggestions for system improvement, as well as system usage log data extracted directly from the system's database to independently verify the frequency and nature of actual system use. The validity of the evaluation questionnaire was established through expert review and pilot testing, while reliability was assessed using Cronbach's alpha, with all constructs returning coefficients above the acceptable threshold of 0.7.

Quantitative evaluation data were analyzed in SPSS version 26 using descriptive statistics to characterize user perceptions of the developed system, and using Pearson correlation and multiple regression analysis to examine the relationship between perceived usefulness, perceived ease of use, and user satisfaction(Nelson et al., 2022). A path model was further estimated in AMOS, consistent with the Technology Acceptance Model, to test the hypothesized mediating role of perceived usefulness in the relationship between perceived ease of use and user satisfaction, generating standardized path coefficients for direct and indirect effects. Qualitative feedback from open-ended survey items was analyzed thematically to identify specific strengths and areas for improvement in the developed system. Ethical clearance was obtained from the relevant university and school authorities prior to data collection, and informed consent was obtained from all participants.

RESULTS

System Development Outcomes

The requirements analysis phase identified four priority functional modules for the students' registration system: a new student admission module allowing administrative staff to capture and store new student biodata and admission details electronically; a class and stream allocation module enabling the assignment and reassignment of students to classes and streams with automatic generation of updated class lists; a student biodata management module allowing authorized staff to view, update, and maintain student records over the course of a student's enrollment at the school; and a searchable record retrieval module allowing staff to quickly locate individual student records by name, admission number, or class. The developed system was successfully implemented on the school's local server infrastructure and made accessible to authorized users via the school's local area network, with system usage logs confirming that all four core modules were actively used during the piloting period, with all 18 targeted administrative and teaching staff (100 percent) recording at least one system login during the term-long pilot, and a total of 214 new student admissions processed through the system's admission module during the period.

Descriptive Statistics

Demographic Characteristics of Respondents

Table 1: Demographic Characteristics of Evaluation Respondents (n = 52)

Characteristic	Category	Frequency	Percent (%)
Category of respondent	Administrative staff	8	15.4
	Class teachers	42	80.8
	Bursar's office staff	2	3.8
Gender	Male	29	55.8
	Female	23	44.2
Prior experience with computerized systems	Yes	31	59.6
	No	21	40.4
System functions used during pilot	Record viewing only	12	23.1
	Record viewing + updating	22	42.3
	Full access (admission + allocation + updating)	18	34.6

Source: Primary Data, 2025

Table 1 showed that class teachers made up the large majority of evaluation respondents (80.8 percent), reflecting the fact that all class teachers required system access to view and update their respective class records, while administrative staff (15.4 percent) and bursar's office staff (3.8 percent) made up the remainder. Slightly more than half of respondents (59.6 percent) reported prior experience with computerized systems generally, and more than a third of respondents (34.6 percent) had full system access covering admission, allocation, and record updating during the pilot, indicating a reasonably deep level of system engagement across the user base.

6.2.2 Descriptive Statistics for TAM Constructs

Table 2: Descriptive Statistics of Perceived Usefulness, Perceived Ease of Use, and User Satisfaction (5-point Likert scale)

Construct	Indicator	Mean	Std. Dev.	Interpretation
Perceived ease of use	System is easy to navigate	3.98	0.71	High
	Learning to use the system was quick	3.84	0.80	High
	Overall perceived ease of use index	3.91	0.75	High
Perceived usefulness	System reduces time spent on registration tasks	4.02	0.69	High
	System improves accuracy of student records	3.79	0.83	High

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	Overall perceived usefulness index	3.87	0.77	High
User satisfaction	Overall satisfaction with the system	3.81	0.78	High
	Willingness to continue using the system	3.88	0.74	High
	Overall satisfaction index	3.84	0.76	High

Source: Primary Data, 2025

Table 2 showed that perceived usefulness was rated highest of the three constructs (mean = 3.87), driven particularly by strong agreement that the system reduced time spent on registration tasks (mean = 4.02), the single highest-rated indicator across the entire evaluation. Perceived ease of use was also rated highly (mean = 3.91), and overall user satisfaction averaged 3.84, with willingness to continue using the system (mean = 3.88) rated slightly higher than overall satisfaction (mean = 3.81).

Inferential Statistics

Correlation Analysis

Table 3: Pearson Correlation Matrix

Variable	1	2	3
1. Perceived ease of use	1.000		
2. Perceived usefulness	0.558**	1.000	
3. User satisfaction	0.612**	0.671**	1.000

Note: **Correlation is significant at the 0.01 level (2-tailed), n = 52.

Source: Primary Data, 2025

The correlation results in Table 3 showed a strong, statistically significant positive relationship between perceived ease of use and user satisfaction ($r = 0.612$, $p < 0.01$), and an even stronger relationship between perceived usefulness and user satisfaction ($r = 0.671$, $p < 0.01$), while ease of use and usefulness were themselves moderately correlated ($r = 0.558$, $p < 0.01$).

6.3.2 Regression Analysis

Table 4: Multiple Regression Results — Dependent Variable: User Satisfaction

Predictor	B	Std. Error	Beta (β)	t	Sig. (p)
(Constant)	0.712	0.339		2.101	0.041
Perceived ease of use	0.284	0.093	0.291	3.054	0.004
Perceived usefulness	0.401	0.089	0.421	4.506	0.000

Model summary: $R = 0.695$, $R^2 = 0.483$, Adjusted $R^2 = 0.462$, $F(2, 49) = 22.87$, $p = 0.000$

Source: Primary Data, 2025

The regression results in Table 4 showed that the overall model was statistically significant ($p < 0.001$) and jointly explained 48.3 percent of the variance in user satisfaction ($R^2 = 0.483$), with perceived usefulness ($\beta = 0.421$, $p < 0.001$) emerging as the stronger predictor compared to perceived ease of use ($\beta = 0.291$, $p < 0.01$) (Nelson et al., 2023).

Path Analysis (Structural Model)

A path model consistent with the Technology Acceptance Model was estimated in AMOS to test the hypothesized mediating role of perceived usefulness in the relationship between perceived ease of use and user satisfaction.

Table 5: Standardized Path Coefficients

Path	Standardized β	C.R. (t-value)	p-value	Decision
Perceived ease of use $\rightarrow$ Perceived usefulness	0.558	4.69	0.000	Significant
Perceived usefulness $\rightarrow$ User satisfaction	0.401	3.62	0.000	Significant
Perceived ease of use $\rightarrow$ User satisfaction (direct)	0.291	3.05	0.004	Significant
Perceived ease of use $\rightarrow$ Usefulness $\rightarrow$ Satisfaction (indirect)	0.224		0.005 (bootstrap)	Significant
Total effect (Perceived ease of use $\rightarrow$ User satisfaction)	0.515		0.000	Significant

Model fit indices: $\chi^2/df = 1.61$, GFI = 0.933, CFI = 0.951, RMSEA = 0.062 — acceptable model fit (given small sample size, $n = 52$).

Source: Primary Data, 2025

The path analysis in Table 5 confirmed the Technology Acceptance Model's core proposition that perceived ease of use influenced user satisfaction both directly ($\beta = 0.291$) and indirectly through its effect on perceived usefulness ($\beta = 0.224$), with perceived usefulness functioning as a partial mediator; the total effect of perceived ease of use on user satisfaction ($\beta = 0.515$) was notably larger than the direct effect alone.

Qualitative Findings

Open-ended survey feedback was overwhelmingly positive regarding the time savings achieved during the admission period, with several administrative staff respondents specifically noting that the new system reduced the time required to process a new student's admission from approximately fifteen minutes under the manual system to under five minutes using the computerized system. Class teachers highlighted the searchable record retrieval module as particularly valuable for quickly locating student information during parent meetings and disciplinary proceedings, though several respondents suggested that the system's reporting features be expanded to allow automatic generation of class lists in formats suitable for direct printing, feedback that has been incorporated into the recommendations for further system enhancement.

Discussion Of Results

The findings of this study provided strong empirical support for the Technology Acceptance Model's core theoretical proposition that perceived ease of use functions as a foundational determinant of user satisfaction, operating both directly and indirectly through its effect on perceived usefulness, as demonstrated by the path coefficients in Table 5 showing that a substantial share of the total effect of ease of use on satisfaction (0.224 out of 0.515) was transmitted indirectly through perceived usefulness. This finding was reinforced by the qualitative evidence regarding the substantial time savings achieved in the admission process, which provided a concrete, tangible basis for the high perceived usefulness ratings observed in Table 2 (mean = 3.87), consistent with the DeLone and McLean model's proposition that system quality translates into user satisfaction primarily through its perceived impact on users' actual task performance, in this case the speed and accuracy of student registration tasks.

The finding that class teachers, who made up the majority of evaluation respondents and who had the most varied levels of prior computerized system experience, nonetheless reported high ease of use and satisfaction scores, suggested that the participatory, iterative Rapid Application Development methodology employed during system design was successful in producing an interface accessible to users regardless of their prior technical background, consistent with the literature's emphasis on participatory development as a key success factor for administrative information systems targeting non-technical staff. The specific qualitative feedback requesting expanded automatic class-list-printing functionality pointed to an important, currently unmet, dimension of perceived usefulness that could further strengthen user satisfaction if addressed in a subsequent system iteration.

Conclusion

This study concluded that the students' registration system designed and implemented for Mbogo High School was well received by its intended users during the piloting period, with high mean scores recorded for perceived ease of use, perceived usefulness, and overall user satisfaction, and with system usage logs and qualitative feedback confirming substantial administrative efficiency gains, particularly in reducing the time required to process new student admissions.

The study further concluded that user satisfaction with the developed system was shaped both directly and indirectly by perceived ease of use, with perceived usefulness serving as a significant partial mediator of this relationship, confirming the applicability of the Technology Acceptance Model to the evaluation of custom-built administrative systems within the Ugandan secondary education context. It was also concluded that the participatory, iterative Rapid Application Development methodology employed during system design likely contributed meaningfully to the strong user acceptance outcomes observed across a user base with varied prior technical experience.

Recommendations

Based on the findings and conclusions of this study, it is recommended that Mbogo High School's administration proceed with full-scale adoption of the developed students' registration system as the school's primary registration platform, given the strong user acceptance outcomes and tangible administrative efficiency gains observed during the pilot period. It is further recommended that the school institute regular staff training sessions to ensure that all administrative staff and class teachers, including newly recruited staff, are proficient in using the system, and that a dedicated staff member be designated to provide first-line technical support for day-to-day system issues.

The study also recommends that the development team incorporate the specific user feedback gathered during the evaluation, particularly the request for automatic, print-ready class list generation, into a subsequent system enhancement iteration. Additionally, it is recommended that the school establish a routine data backup schedule to safeguard student records stored within the system against potential data loss, given the critical and sensitive nature of the information the system now holds. Finally, the study recommends that further research be conducted following full-scale adoption to assess whether the strong user acceptance outcomes observed during the limited pilot period are sustained over a longer period and across successive admission cycles, and to quantify more precisely the administrative time and cost savings achieved relative to the previous manual registration process.

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