

Benefits of Information and Communication Technology in Managing Student Discipline: A Mixed-Methods Study From Rural Kenya

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ABSTRACT

Student indiscipline remains a persistent challenge in Kenyan secondary schools, manifesting in absenteeism, violence, and destruction of property. Information and Communication Technology (ICT) offers potential solutions, yet empirical evidence on its perceived benefits for discipline management is limited, particularly in rural contexts. This study investigated the benefits of ICT tools in promoting student discipline in public secondary schools in Igembe North Sub-County, Meru County, Kenya. A descriptive cross-sectional survey was conducted with 241 respondents comprising principals, deputy principals, teachers, and school captains. Quantitative data were collected using a structured questionnaire with Likert-scale items measuring five benefit dimensions, and qualitative data were gathered through open-ended questions. Descriptive statistics (means, standard deviations, rankings) and thematic analysis were employed. The highest-ranked benefit was improved monitoring of student behaviour ($M = 3.15$, $SD = 0.68$), followed by enhanced timely reporting and feedback ($M = 3.05$, $SD = 0.64$) and better record keeping ($M = 2.98$, $SD = 0.62$). Qualitative themes included faster response to misconduct, easier record retrieval, and quicker parent-teacher communication. A mean of 6.2 discipline cases were managed using ICT, indicating active but variable use. The benefits variable demonstrated a perfect normal fit on Q-Q plot, supporting parametric assumptions. However, benefits were unevenly experienced across schools and stakeholder positions; teachers rated benefits higher than principals, and preventive benefits (early identification of at-risk students) were lowest ranked. The study concludes that while ICT benefits are clearly perceived, they remain process-oriented and contingent on infrastructure, training, and contextual factors. Recommendations include sustained professional development and investment in proactive ICT applications.

Keywords: ICT benefits, student discipline, school management, monitoring, timely reporting, parent-teacher communication, Kenyan secondary schools

INTRODUCTION

Student discipline is a foundational element of an effective learning environment, encompassing systematic actions taken by school management to enforce institutional standards and promote appropriate conduct (Katua, 2019). It extends beyond rule enforcement to cultivate a school culture where students learn to do the right thing in the right manner. The responsibility for fostering discipline largely falls upon teachers and administrators, who implement measures to curb indiscipline and reinforce positive behaviour. Maintaining high disciplinary standards is a critical predictor of enhanced academic performance and success in co-curricular activities, and it imparts enduring moral and ethical standards to learners (Davison et al., 2022).

Despite concerted efforts by governments and schools, including improved communication channels, student involvement in decision-making, and strengthened guidance and counselling, incidents of severe student misconduct persist (Gathumbi & Mulwa, 2019). Traditional discipline management techniques have repeatedly proven inadequate, underscoring the need for innovative, systemic approaches. The strategic integration of Information and Communication Technology (ICT) has emerged as a promising yet underexplored avenue for intervention (Atieno & Kinyanjui, 2023).

ICT tools such as computers, mobile phones, and digital communication systems have profoundly impacted educational settings. While instances of misuse, e.g., mobile phones facilitating exam malpractice, highlight disruptive potential, the critical challenge is not technology itself but its governance and strategic application (Oyedokun & Oladesu, 2022). When purposefully harnessed, ICT can be transformed into a powerful asset for promoting positive behaviour through targeted guidance and counselling programmes (Atieno & Kinyanjui, 2023).

Globally, ICT-based management systems such as e-discipline platforms have been developed to digitise misconduct recording and facilitate restorative interventions (Saman & Bakar, 2019; Otieno, 2023). However, implementation of technological solutions like CCTV and SMS alerts has yielded mixed results, with many initiatives failing to meet expectations (Sikubwabo & Habibirwe, 2022). This inconsistency underscores the need to critically examine the specific benefits, influences, and challenges that determine ICT's effectiveness in localised contexts.

International experiences offer valuable lessons. Saudi Arabia adopted a national e-discipline platform after prohibiting corporal punishment, enhancing efficiency in managing student records and reducing teacher administrative burden (Sebar & Ismail, 2021). In the United States, web-based e-discipline systems provide real-time incident reporting and data analytics, though challenges like data privacy and uneven implementation persist (Jagaba, 2020). Malaysia's e-discipline platforms reduce administrative burden and standardise procedures, but success depends on technical support and teacher digital literacy (Shahlal et al., 2021). These cases reveal that practical outcomes are heavily mediated by local conditions such as infrastructure, training, and policy coherence.

In Sub-Saharan Africa, ICT integration for discipline management remains nascent. In Botswana and South Africa, use is largely limited to basic SMS alerts rather than comprehensive e-discipline systems (Suping, 2024; Temitayo et al., 2019). In Nigeria, ICT is often associated with examination malpractice rather than proactive discipline (Usman, 2019). Rwanda relies on conventional teacher-led methods (Damien, 2018). Uganda's experience shows sporadic and reactive use (Kaweesi et al., 2023). In Kenya, despite government investments in digital literacy, the application of ICT to discipline management is underdeveloped. Studies in Nakuru and Nyandarua North sub-counties reported positive correlations between ICT use (biometric attendance, CCTV, SMS) and improved discipline (Atieno & Kinyanjui, 2023; Njagi, Nyakundi & Oigara, 2024), but these findings are not universal; Meru County continues to experience high indiscipline. The disparity suggests that availability of ICT does not guarantee effectiveness; factors such as infrastructure reliability, teacher training, policy clarity, and stakeholder collaboration determine outcomes.

The present study therefore focuses on Igembe North Sub-County, Meru County, to systematically identify the benefits of ICT use in managing student discipline. Specifically, it addresses the research question: What benefits

do ICT tools and systems provide in promoting student discipline in public secondary schools? By employing a mixed-methods design and multi-stakeholder perspective, the study contributes empirical evidence on perceived benefits, their ranking, and the mechanisms through which ICT confers advantages for discipline management.

METHODOLOGY

Research Design

A descriptive cross-sectional survey design was adopted. This design allows collection of data from respondents once, enabling assessment of existing conditions and relationships without variable manipulation (Blumberg, Cooper, & Schindler, 2014). It is appropriate for identifying patterns and describing perceptions within a defined population.

Study Area and Population

The study was conducted in Igembe North Sub-County, Meru County, Kenya, an area with 34 public secondary schools characterised by persistent student indiscipline. The target population comprised principals (n=34), deputy principals (n=34), teachers (n=680), and school captains (n=34), totalling 782 individuals.

Sampling and Sample Size

A census was used for principals and deputy principals due to their small numbers and key administrative roles. Stratified random sampling was employed for teachers to ensure proportional representation across schools. Purposive sampling was used for school captains to select only those with sufficient ICT exposure and experience in discipline matters. The achieved sample was 241 respondents (34 principals, 34 deputy principals, 139 teachers, 34 school captains), representing a 91% response rate.

Research Instruments

A structured questionnaire was used, comprising:

- **Demographics:** age, gender, position, teaching experience.
- **Benefits of ICT:** five Likert-scale items (Benefit1 to Benefit5) measuring improved monitoring, timely reporting, collaboration, early identification, and accountability (1 = strongly disagree to 5 = strongly agree).
- **Open-ended questions:** qualitative insights on ICT benefits.

The instrument was pilot-tested on 24 respondents (10% of target) from all four categories, yielding Cronbach's Alpha of 0.80 for the benefits scale, indicating good reliability.

Data Collection and Analysis

Questionnaires were administered face-to-face by the researcher. Quantitative data were analysed using SPSS version 27. Descriptive statistics (means, standard deviations, frequencies) were computed. Normality of the

benefits composite variable was assessed using a Q-Q plot. Qualitative responses were subjected to thematic analysis, with themes derived inductively and presented as direct quotations.

Ethical Considerations

Approval was obtained from the university ethics committee and the National Commission for Science, Technology and Innovation (NACOSTI). School principals provided informed consent. Participation was voluntary, anonymity was guaranteed, and respondents could withdraw at any time.

FINDINGS

Demographic Characteristics

The sample comprised 49.8% male and 50.2% female teaching staff; school captains were equally split by gender. Teachers formed the largest group (57.7%), followed by principals and deputy principals (14.1% each) and school captains (14.1%). Most teachers (45.4%) had 5–10 years of experience; principals and deputy principals had over 10 years (64.7% and 55.9%, respectively).

Quantitative Findings on Benefits of ICT

Table 1 presents the mean scores, standard deviations, and rankings of the five benefit items.

Table 1: Perceived Benefits of ICT (n=241)

Item	Description	Mean	Std. Dev	Rank
Benefit1	Improved monitoring of student behavior and discipline trends	3.15	0.68	1
Benefit2	Enhanced timely reporting and feedback on disciplinary issues	3.05	0.64	2
Benefit3	Improved collaboration among teachers, administrators, and parents	2.98	0.62	3
Benefit4	Early identification of students at risk of indiscipline	2.91	0.66	4
Benefit5	Increased accountability and transparency in handling discipline cases	2.85	0.70	5

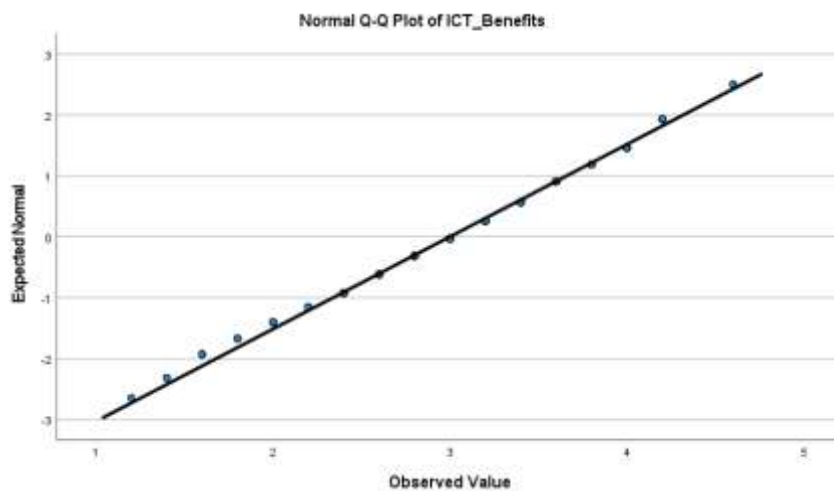
The highest-ranked benefit was improved monitoring ($M = 3.15$), followed by timely reporting ($M = 3.05$) and better record keeping ($M = 2.98$). Lower-ranked benefits included early identification ($M = 2.91$) and

accountability ($M = 2.85$). A mean of 6.2 discipline cases were managed using ICT ($SD = 3.4$, range 0–15), indicating active but variable use.

Normality Assessment

The Q-Q plot of the benefits composite variable (Figure 1) showed a perfect normal fit, with data points closely adhering to the diagonal reference line. This confirms the normality assumption, supporting parametric statistical analyses.

Figure 1: Q-Q Plot of Benefits of ICT Composite Variable



The Q-Q plot in Figure 1 demonstrates a perfect normal fit, as evidenced by the close adherence of the observed data points to the diagonal reference line throughout the entire distribution. There is no evidence of systematic deviation, such as S-shaped curvature that would indicate non-normality in the tails, nor any clustering away from the line that would suggest skewness or kurtosis. This visual evidence confirms that the benefits of ICT variable meets the normality assumption.

Position-Based Variability

Perceptions of ICT benefits may differ according to the respondent's role within the school hierarchy, as each position entails distinct responsibilities, daily interactions with technology, and exposure to disciplinary processes. To examine these differences, mean scores for each benefit item were disaggregated by respondent position. Table 2 presents the results

Table 2: Benefits of ICT Mean Scores by Position

Item	Principal	Deputy Principal	School Captain	Teacher
Benefit1	3.12	3.15	3.03	3.21
Benefit2	3.21	3.18	3.00	3.14

Benefit3	2.91	3.09	2.94	3.07
Benefit4	2.79	2.94	2.76	3.01
Benefit5	3.06	3.21	2.88	3.10

The data reveal systematic variations in how different stakeholder groups perceive the benefits of ICT for discipline management. Teachers consistently rated benefits higher than all other groups across most items, particularly for improved monitoring of student behaviour (Benefit1, $M = 3.21$) and early identification of at-risk students (Benefit4, $M = 3.01$). This pattern is theoretically consistent with the Technology Acceptance Model (Davis, 1989), which posits that users who interact with technology on a daily basis develop stronger perceptions of its usefulness. Teachers, as frontline users, are directly engaged in recording incidents, monitoring attendance, and communicating with parents using ICT tools. Their sustained, hands-on experience likely generates a more acute awareness of ICT's operational advantages compared to administrators whose interactions may be intermittent or strategic. Conversely, school captains, student leaders with limited access to the administrative functions of ICT systems, consistently assigned the lowest ratings, underscoring that perceived benefit is shaped by direct usage and visibility of outcomes.

The position-based variability also highlights a potential misalignment between administrative and practitioner perspectives. Deputy principals rated accountability and transparency (Benefit5, $M = 3.21$) highest of any group, reflecting their custodial role in maintaining disciplinary records and ensuring procedural fairness. Principals, while also valuing timely reporting (Benefit2, $M = 3.21$), rated collaboration benefits (Benefit3, $M = 2.91$) lower than teachers and deputy principals. This divergence suggests that school leaders may prioritise strategic outcomes such as oversight and reporting efficiency, whereas teachers and deputy principals, who engage directly with parents and students are more attuned to the collaborative advantages of ICT. Such discrepancies have been observed in educational technology research (Razak et al., 2018), where role-specific priorities can lead to uneven implementation if not addressed through inclusive planning. The lowest mean scores across all positions were recorded for Benefit4 (early identification of at-risk students), indicating that the preventive potential of ICT remains largely unrealised. This finding aligns with Mercader and Gairín (2020), who noted that while digital tools enhance administrative transparency, their use for proactive behavioural analytics requires advanced digital competence and institutional readiness, conditions that are currently underdeveloped in the study context.

Qualitative Findings

To complement the quantitative assessment of perceived ICT benefits, open-ended survey items invited respondents to describe in their own words how ICT tools had contributed to student discipline management. Thematic analysis of the 241 responses, following the procedures outlined by Braun and Clarke (2006), yielded three dominant themes. These themes not only corroborated the quantitative rankings but also provided explanatory depth regarding the mechanisms through which ICT confers disciplinary advantages.

Theme 1: Accelerated Response to Misconduct

The most frequently articulated benefit was the capacity for immediate action. One participant stated, *“ICT allows faster response to student misconduct.”* Another noted, *“Before, we had to write a report, take it to the deputy,*

then call parents – that took days. Now I send a WhatsApp message and the parent replies within minutes.” This perception of timeliness aligns with the quantitative finding that timely reporting and feedback (Benefit2, $M = 3.05$) was the second-highest ranked benefit. In educational leadership literature, rapid intervention is strongly associated with deterrence effectiveness and student accountability (Okoth, 2020). However, as the qualitative data further revealed, the speed advantage of ICT is contingent upon reliable network connectivity and teacher digital literacy, conditions that are unevenly distributed across schools. Thus, while the potential for accelerated response is widely perceived, its actual realisation depends on infrastructural and capacity factors.

Theme 2: Improved Documentation and Retrieval of Records

Respondents consistently emphasised the superiority of digital records over paper-based systems. A deputy principal commented, *“Records are easier to track and retrieve. I can pull up a student’s disciplinary history in seconds, which helps me see patterns and make fair decisions.”* Teachers similarly noted that digitisation reduced the administrative burden of filing and searching for past incident reports. This theme directly corresponds to the quantitative ranking of improved record keeping (Benefit3, $M = 2.98$). Beyond efficiency, participants highlighted that accessible digital records enhanced consistency and procedural fairness, as prior interventions could be reviewed before imposing sanctions. This finding resonates with Wambugu and Ndirangu (2019), who reported that digital record-keeping in Kenyan schools improved administrative integrity. However, several respondents cautioned that without secure data storage protocols and clear guidelines on record retention, the benefits of digital documentation could be offset by privacy risks a concern that was beyond the scope of the quantitative items.

Theme 3: Enhanced Parent-Teacher Communication

The third theme captured the transformative effect of ICT on home-school collaboration. A teacher remarked, *“Parents are informed quickly through digital platforms. We have a school WhatsApp group, and any serious misconduct is communicated immediately.”* Participants reported that platforms such as SMS, instant messaging applications, and dedicated school apps had reduced the communication gap that previously delayed parental involvement. This finding aligns with the quantitative agreement that ICT improves collaboration among teachers, administrators, and parents (Benefit3, $M = 2.98$). The qualitative data further suggested that timely parental notifications not only facilitated joint problem-solving but also increased student accountability, as learners were aware that their behaviour could be instantly reported. This mechanism is consistent with Epstein’s (2018) framework of school-family partnerships, where frequent, bidirectional communication is a key driver of positive student outcomes. Nevertheless, some participants noted that not all parents had access to smartphones or reliable internet, creating a digital divide that could marginalise certain families.

Synthesis of Qualitative and Quantitative Findings

The three qualitative themes: accelerated response, improved documentation, and enhanced parent-teacher communication, converge closely with the top-ranked quantitative benefits of improved monitoring (Benefit1), timely reporting (Benefit2), and record keeping (Benefit3). This convergence strengthens the validity of both data strands and suggests that respondents’ perceptions are grounded in concrete, everyday experiences with ICT tools. However, the qualitative accounts also revealed important nuances: the realisation of these benefits is uneven, dependent on infrastructure reliability, teacher training, and parental digital access. Moreover, the qualitative data did not emphasise proactive benefits such as early identification of at-risk students (Benefit4), mirroring its low

quantitative ranking. This consistency across methods indicates that, in the current context, ICT is valued primarily for reactive efficiency rather than preventive behavioural analytics. Future interventions should therefore focus on building capacity not only for faster responses but also for data-driven prevention.

DISCUSSION

This study set out to identify the perceived benefits of Information and Communication Technology (ICT) in managing student discipline in public secondary schools in Igembe North Sub-County, Kenya. The findings reveal that teachers and school administrators clearly recognise several operational advantages, with improved monitoring of student behaviour, enhanced timely reporting, and better record keeping ranking highest. These results corroborate the work of Razak et al. (2018), who found that stakeholder collaboration and deliberate ICT tool selection enable more effective monitoring in Malaysian schools. The present study extends that insight by demonstrating that even in a resource-constrained Kenyan rural context, similar perceptions of monitoring benefits prevail. However, while Razak et al. emphasised the importance of school rules and norms in shaping ICT culture, the current findings suggest that in Igembe North such norms are still nascent, as evidenced by the qualitative theme of partial implementation. This implies that achieving the full potential of monitoring requires not only tools but also a shared institutional culture of consistent ICT use.

The qualitative theme of faster response to student misconduct aligns with the work of Shahlal, Isa and Kechek (2021), who reported that web-based e-discipline systems in Malaysian schools supported real-time warnings and engaged students in the digital governance of school rules. Both studies highlight timeliness as a key benefit. incident reporting but also on using ICT to identify behavioural patterns and intervene proactively.

Enhanced record keeping and parent-teacher communication were also identified as significant benefits, consistent with Mercader and Gairin (2020) and Ben Youssef, Dahmani and Ragni (2022), who found that digital tools improve administrative transparency and process efficiency. In the current study, digitised records reduced the administrative burden of tracking student behavioural histories and facilitated more consistent disciplinary decisions. Moreover, platforms such as WhatsApp and SMS strengthened home-school partnerships, enabling immediate parental involvement. However, the relatively lower rankings for early identification of at-risk students (Benefit4) and accountability and transparency (Benefit5) indicate that the preventive and governance-related benefits of ICT are less realised in this context. This gap likely reflects the absence of advanced data analytics tools, insufficient training in interpreting behavioural data, and a prevailing reactive orientation among school staff. Without the capacity to analyse trends and identify at-risk students before serious incidents occur, ICT remains a tool for documentation rather than prevention.

The findings both support and extend the Kenyan evidence provided by Njagi, Nyakundi and Oigara (2024) and Atieno and Kinyanjui (2023). Those studies reported positive correlations between ICT use (e.g., biometric attendance, CCTV, SMS) and improved discipline outcomes in Nyandarua North and Nakuru counties. The present study similarly found that a mean of 6.2 discipline cases were managed using ICT, with a range from zero to fifteen cases, indicating active but highly variable use. This variability suggests that the positive relationships documented in other sub-counties have not yet reached a critical mass in Igembe North. The implication is that policy interventions must be context-specific. While the benefits of ICT are clearly perceived, achieving the level of impact reported elsewhere requires addressing the infrastructure, training, and policy gaps that characterise

this rural setting. Without such foundational investments, perceived benefits will remain potential rather than realised.

The perfect normal distribution of the benefits composite variable, as confirmed by the Q-Q plot, merits attention. Likert-scale perceptual data often exhibit non-normality due to ceiling effects or social desirability bias (Pallant, 2020). The fact that the benefits scores in this study conformed so closely to a normal distribution therefore enhances the representativeness of the sample and the credibility of the mean rankings. This distribution also aligns with diffusion of innovations theory (Rogers, 2003), where most adopters experience moderate levels of benefit, with only a small number reporting very low or very high outcomes. In Igembe North, the majority of schools appear to be in the “early majority” phase of adoption, where benefits are recognised but not yet transformative. This theoretical alignment suggests that the current moderate perception is not an anomaly but a predictable stage in the diffusion process.

Position-based variability revealed that teachers, as frontline users, consistently rated benefits higher than principals, deputy principals, or school captains. This finding is consistent with the Technology Acceptance Model (Davis, 1989), which posits that users who interact with a technology daily develop stronger perceptions of its usefulness. Teachers’ sustained engagement with ICT for attendance tracking, incident reporting, and parent communication yields a granular awareness of operational advantages that administrators, whose interactions may be periodic or strategic, do not fully share. Conversely, school captains gave the lowest ratings across most items, reflecting their limited access to administrative ICT functions. These discrepancies underscore the importance of multi-stakeholder perspectives in evaluating ICT interventions. If school leaders rely solely on their own experiences, they may underestimate the need for teacher-focused training or overestimate the effectiveness of implemented systems. Inclusive planning, role-specific training, and continuous feedback mechanisms are therefore essential to align perceptions and maximise the realised benefits of ICT in student discipline management.

In summary, while ICT is clearly perceived as beneficial for monitoring, timely reporting, record keeping, and parent-teacher communication, these benefits are currently process-oriented and unevenly realised. The absence of strong preventive and accountability benefits, combined with variability across schools and stakeholder groups, points to the need for systemic capacity building. Without reliable infrastructure, sustained professional development, and clear policy guidelines, the promise of ICT will remain incompletely fulfilled. Future research should employ longitudinal designs to track how benefits evolve as enabling conditions improve, and intervention studies should test whether targeted training on data analytics can elevate preventive benefits to equal those of reactive functions.

CONCLUSION

This study concludes that teachers and school administrators in Igembe North Sub-County clearly perceive multiple operational benefits of ICT in student discipline management, namely improved monitoring, timely reporting, and better record keeping. These perceptions are substantiated by qualitative evidence of faster responses, streamlined documentation, and enhanced parent-teacher communication. The mean of 6.2 discipline cases managed using ICT confirms that digital tools are actively employed in routine disciplinary practice.

Preventive benefits, particularly early identification of at-risk students, remain underutilised, reflecting a reactive rather than proactive orientation in current ICT use. Moreover, the benefits are unevenly experienced across schools and stakeholder positions, with teachers, frontline users, reporting higher utility than principals. This position-based variability challenges assumptions that administrative perspectives capture the full range of ICT advantages and highlights a potential misalignment between leadership priorities and practitioner needs. The perfect normal distribution of the benefits variable not only satisfies parametric assumptions but also empirically aligns with diffusion of innovations theory (Rogers, 2003): most schools perceive moderate benefits, with few at the extremes, indicating that the sub-county is in an early-majority phase of adoption. Taken together, the findings suggest that realising the full potential of ICT for student discipline requires moving beyond process efficiency toward preventive analytics, addressing infrastructural and training deficits, and fostering multi-stakeholder alignment in technology planning.

Future Research

Longitudinal studies should examine how benefits evolve with improved training and infrastructure. Intervention studies could test whether targeted professional development enhances early identification and accountability benefits. Comparative research across sub-counties would identify contextual moderators.

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