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Principals' Intellectual Stimulation Practice: Empowering Adoption of ICT in Teaching and Learning in Kenyan Public Schools

Beatrice Abisaki Mbune

Lecturer, Department of Educational Management, Policy and Curriculum Studies,
East Africa University, Kenya

Dr. S. N Waweru

Senior Lecturer, Department of Educational Management, Policy and Curriculum Studies,
Kenyatta University, Kenya

Dr. F. W Njuguna

Senior Lecturer, Department of Educational Management, Policy and Curriculum Studies,
Kenyatta University, Kenya

Abstract:

Information communications and Technology were introduced into secondary schools with the goal of giving teachers access to information while encouraging their distinctive and innovative techniques for teaching and learning. Teachers become enthusiastic and committed to their work when given demanding tasks that result in positive educational outcomes. However, it is clear that instructors in Kenya continue to fall behind in this area. Without a grasp of leadership behaviors, ICT integration in Kenya remains a phantom. The study aims to evaluate the principal's intellectual stimulation techniques and the empowering use of ICT in teaching and learning in Kenyan public secondary schools. The study used a sequential explanatory mixed method design and focused on 62 school principals chosen through census, 186 teachers, and 372 students selected using a simple random sample process. Data was collected using MLQ-structured questionnaire interviews, document analysis, and checklists. Descriptive analysis was used to explain the patterns in the data and the status of variables, while inferential analysis was used to evaluate the relationship between the variables using regression analysis. The study found a moderately substantial positive correlation between ICT use in school and intellectual stimulation $r(108) = 0.534, p < 0.001$. It was discovered that principals' actions were a significant predictor of ICT adoption in secondary schools; therefore, principals were recommended to foster a culture of trust among teachers by establishing a welcoming workplace atmosphere. This would encourage instructors to overcome challenges using creative and new approaches, ultimately boosting the usage of ICT in the classroom.

Keywords: *Intellectual stimulation, transformational leadership, performance, secondary schools*

1. Introduction

In today's digital age, where technology advancements are constantly transforming the workplace, educators must take a proactive, inventive, and creative approach to teaching Pentang (2021). This has prompted governments to prioritize transformative leadership in the education sector, recognizing that just providing resources to schools has not led to widespread implementation. Cherotich, Kamaku, and Senaji (2022). North House (2016), as quoted by Musyoki, Okoth, Kalai, and Okumbe (2021), states that transformational leaders have the ability to significantly modify an organization's goals and operations through continuous employee engagement. In Kenya, secondary school principals are primarily responsible for overseeing teaching curricula. As a result, their behavioral characteristics may have a positive or negative impact on how ICT is used in the classroom. For successful utilization of ICT, transformational principals establish a supportive environment, offer constructive criticism, stimulate skill development, and engage teachers in realizing their skills (Cuadros, Reche & Lusena, 2016; Pentang, 2021). Teachers establish trust in leaders who are willing to stimulate their intellectual abilities by providing them with tough assignments that encourage creativity and imagination in questioning their assumptions in the classroom (Sharma, 2016). Maria-Luisa, Chiara, Tessa, Alberto, Philipp, and Petko (2023) identified a lack of proper supervision from school administration as the primary impediment to technology use in the classroom in the Philippines.

Intellectual stimulation refers to a person's capacity to foster and advance instructors' creativity through the use of technology in the classroom. Yamamoto and Yamaguchi (2019). The primary responsibility of a transformational principal is to facilitate and enhance the professional growth of teachers by creating a favorable and productive work environment, which encompasses the provision of sufficient and effective technological resources. Principals who cultivate

a conducive working atmosphere encourage their instructors to exhibit creativity and innovation in problem-solving endeavors (Garcia, Abrego & Jauregui, 2019). In addition, principals should stimulate teachers through their own actions of using technology themselves in the classroom. Principals act as agents of change when they encourage technological use in schools because they inspire teachers to use technology themselves, and their support and trust in the abilities of teachers can improve technology integration in schools (Thannimalai & Raman, 2018)

The World Intellectual Property Organization's Global Innovation Index (G11) 2019 recognizes Kenya, along with South Africa and Mauritius, as an important innovation center in Sub-Saharan Africa (Murithi & Yoo, 2021). This shows that the Kenyan government's commitment to the use of technology in educational settings is exceptional. The 2019 National Information Communication Technology Policy Document advocates for the development of a society that prioritizes knowledge acquisition and aligns with the goals outlined in Vision 2030 (Government of Kenya, 2007). In line with this Policy, the government focuses on enhancing access, equity, and infrastructure development to close the technological gap in the education sector. Additionally, The Kenyan government has launched a digital literacy program in basic education to encourage the use of ICT for learning purposes among students (Cherotich, Kamaku & Senaji, 2022). In addition, several Kenyan training institutions have offered pedagogical teaching and managerial education to principals prior to their appointment to school leadership roles. Likewise, the Teachers Service Commission, which is responsible for appointing teachers, actively promotes teacher capacity training at the Center for Mathematics, Science, and Technology Education (CEMESTEPA) by utilizing the latest ICT capabilities (Baraza & Peter, 2021; TSC Manual, 2013).

Naicker and Khumalo's (2023) study - "Secondary school leadership and technology integration in pedagogical practices: Challenges, obstructions, and accomplishments" established that the application of information and communication technologies in teaching is related to student achievement similarly. Cherotich, Kamaku, and Senaji (2022) found that 86.4% of participants believed that ICT use is linked to digital learning and improved outcomes. Innovative principals may raise pressure on teachers to utilize ICT in teaching and learning, leading to better student achievement.

In a survey conducted by the Teacher's Service Commission on 1200 teachers in selected public schools, 84.2% of respondents felt that Kenyan teachers had not effectively cultivated innovation and creativity in their teaching activities (Oduor, 2018; Wanzala & Nyamai, 2018). Exposure to technology can enhance students' problem-solving skills and expand their conceptual knowledge (Ibañez & Pentang, 2021; Pentang et al., 2021). Furthermore, according to Youssef and Dahmani (2020), the enhancement of cognitive abilities has been found to result in improved performance. Therefore, the absence of ICT skills by teachers could be detrimental to teaching and learning, resulting in subpar educational achievements.

Muia (2018) highlighted the correlation between engaging in intellectual stimulation activities and performance in the Kenya Certificate of Secondary Education (KCSE). As a way to assess the cognitive stimulation provided by principals and the adoption of ICT in Kakamega, it is necessary to examine the trends in KCSE performance over the past five years.

Year	Total No. of Candidates	Eligible C+ and above	Mean Grade KCSE
2018	31117	3961	4.068 (D+)
2019	33287	5878	4.4511 (C-)
2020	36463	6959	4.6113 (C-)
2021	40283	6847	4.3286 (C-)
2022	44490	7541	4.4852 (C-)
Totals	214193	33957	

Table 1: KCSE Performance in Kakamega County 2017- 2022

Source: CQAO County Quality Assurance Office Kakamega

Table 1 shows that Kakamega County registered many candidates for KSCE, but the majority of them did not meet the criterion of C+ or higher to enter competitive careers in tertiary colleges or universities; competitive careers include Education, civil engineering, law, medicine and so forth. The inability of students entering universities to pursue competitive occupations elevates the impact of transformational leadership on the integration of ICT in teaching and learning. The primary goal of this study is to investigate the role of public secondary school leaders in enabling the integration of information and communication technology (ICT) among instructors. The research hypothesis guiding this study is H02: There is no significant influence between Principals' Intellectual stimulation and ICT integration in Public secondary schools in Kakamega County.

2. Literature Review

2.1. Empirical Review

In their study conducted in 2023, Maria-Luisa, Chiara, Tessa, Alberto, Philipp, and Petko examined how school principals who practice transformational leadership can support teachers in effectively utilizing digital technologies to promote students' engagement in intellectually challenging learning activities. The study focused on the role of teachers' positive beliefs, technical skills, the digital school infrastructure, and their ability to teach using digital technologies as mediators. The study administered questionnaires to 2247 upper secondary teachers in Switzerland who were included in the research. The results of the study showed that there was a strong and positive relationship between transformational

leadership and various aspects of the digital school infrastructure, teachers' positive beliefs about digital technology, their technical skills, and their ability to teach using digital technologies. This relationship was confirmed through multilevel correlation and structural equation modeling analysis. Except for the digital school infrastructure, all of these criteria were found to significantly and positively predict higher degrees of technology integration. These findings highlight the importance of transformational leadership techniques for principals in supporting teachers as major players in technology integration in classrooms. Nevertheless, the study had certain limitations. Firstly, it was carried out in Switzerland, which differs from the current study undertaken in Kenya. The findings may not be generalizable due to the influence of a distinct setting. Furthermore, the study employed a questionnaire as a means of data collection, which has a risk of misunderstanding information if respondents do not pay close attention, thus impacting the accuracy of the findings (Idahosa & Akagibe, 2021). The current study utilized a range of research instruments, such as interview guides, document analysis, observational checklists, and questionnaires.

Naicker and Khumalo (2023) conducted a qualitative study in a specific high school in South Africa to investigate the relationship between secondary school leadership and the incorporation of technology in teaching methods. Obstacles, hindrances, and achievements: A total of 20 participants were selected for the study and were all subjected to interviews. A total of 4 principals, 8 teachers and 8 learners took part in the study. The thesis was based on the Technological Pedagogic Content Knowledge (TPACK) Framework. The study findings confirmed that possessing technology leadership is crucial for effectively leading and managing technological change in schools. Principals and teachers are recognized as pioneers in the field of technology. Thus, they assume a crucial role as pioneers in technology by facilitating and advocating for technological advancements in educational institutions. However, the study encountered several limitations. Firstly, it examined school leadership and technology integration without specifying the type of leadership, which could potentially yield conflicting outcomes. Secondly, the study was conducted in South Africa, which differs from the present study conducted in Kenya. Thirdly, the study employed a quantitative approach and relied solely on interviews as the data collection method. This exclusive reliance on one tool may not yield the desired results, as some participants may provide exaggerated responses that could influence the study's findings. Furthermore, the study utilized the TPACK theory, which has a hierarchical structure of development. Consequently, the theory may not fully capture the process through which teachers enhance their proficiency in each competency. However, the present study specifically examined the distinct requirements of teachers, including their abilities in utilizing technology.

Gyansah (2020) conducted a study in Ghana to investigate the influence of transformational leadership on the academic achievement of students enrolled in government-funded secondary schools. The study utilized a convergent parallel approach to investigate nineteen school administrators, selected using Slovin's algorithm for sample calculation. The study employed ordinary least squares regression (OLS) to establish the causal connection between transformational leadership in education and academic achievement. The results of the study indicated that student performance was positively influenced by transformational leadership characteristics, particularly intellectual stimulation. The researcher proposed that administrators implement novel strategies to enhance the academic performance of students. However, there were some limitations associated with the study:

- First, the relationship between the academic achievement of students and the transformational leadership practices of the school head was examined, while the current research establishes a connection between the transformational leadership influence of the principal and the implementation of ICT in instruction.
- Secondly, their sample size was more limited to 19, consisting of head teachers, which may not adequately represent the study problem compared to the 62 principals in this study's population.

A convergent parallel design was utilized for the study, which may only be effective if the qualitative and quantitative findings do not contradict one another.

Muvango (2021) investigated the cooperation of e-tools in the instruction in government-funded high schools in Kakamega County. Bruner's (1990) Constructivism Theory served as the foundation for his research, which used a descriptive design. The findings revealed that e-tools were available but insufficient for recurrent use; 58% of teachers lacked computer and internet expertise. The study suggests that the government should offer ample e-tools to enhance school instruction. In consultation with stakeholders, he further suggested that the government organize correspondence courses on electronic tool usage in high schools. There were a few setbacks; for example, the study looked at the incorporation of e-resources in instructing English as a subject as opposed to the current study that looks at principals' transformational leadership influence and integration of ICT across all the subjects. The research disclosed a large proportion of teachers who lacked ICT skills. Lastly, findings showed that teachers did not frequently use e-resources. This leaves a gap to be filled. Therefore, the current study will address the main objective of this study, which is to examine the influence of principals' transformational leadership on e-resources incorporation in curriculum instruction in public high schools in Kakamega County.

3. Research Methodology

The study adopted a sequential explanatory mixed-method design. The sequential explanatory design approach was applicable as the researcher was able to gather data in two phases: the quantitative data using closed-ended questionnaires and qualitative data through interview schedules. According to Creswell, this type of design is important as the approaches cover each other's weaknesses. Qualitative research helps build knowledge that is comprehensive by presenting the study under investigation in its natural setting (Śliwa, 2017). In a qualitative approach, the researcher intends to gather data from the participants through open-ended questionnaires and communicate verbally through interviews (Bednarek-Gilland, 2016). This study aims to expose the behaviors' views and beliefs regarding intellectual

stimulation practised by principals and the perception of teachers and learners on their actions in a natural setting (Naicker & Khumalo, 2023).

A quantitative approach is numerical and cannot be measured. Data were collected through a closed-ended questionnaire, document analysis, and observation checklist. The researcher used constructivism to analyze the data gathered from open-ended questions and interviews in the qualitative section in light of theoretical presumptions regarding the transformational leadership components of principals, specifically intellectual stimulation influence on the integration of ICT in teaching and learning in Public High Schools in Kaka Mega County. The use of a constructivist-interpretive paradigm relies on "participants" views of the situation being studied (Creswell, 2012; Orodho, 2009).

3.1. Sample Size and Sampling Technique

The sampling technique used has a direct impact on the accuracy and reliability of the data collected (Lapan, Quartaroli & Riemer, 2012). The sample size consisted of 62 administrators, 186 teachers, 365 students, and one county Quality Assurance Officer. The principals of participating schools were automatically included as the heads of their institutions. This was done due to their reliability and role in providing information on the use of ICT in classrooms. The researcher used the census sample technique because the target population of 69 schools was considered relatively small, eliminating the need for sampling. The sample of instructors was determined by selecting 30% of the target population of 1860, which yielded a total of 186 teachers randomly sampled. According to Kothari (2004), a sample population ranging from 10% to 30% is considered a satisfactory representation for any study. The statistical distribution was determined utilizing the Yamane (1965) formula on Form 3 students. The county Quality Assurance officer was selected using a purposive sampling technique.

3.2. Instrumentation

The study used interview guides, questionnaires, checklists and document analysis to obtain data.

3.3. Questionnaires

To examine the questionnaire's test items, the researcher used the Multifactor Leadership Questionnaire (MLQ) Form 5. The reason for employing MLQ in this study is that it has the potential to examine a number of transformational leadership characteristics.

3.4. Interview Guidelines

In the second phase of the qualitative technique, the researcher collected information from chosen respondents who agreed to participate in the interview. Creswell (2014) agrees that positivist researchers' knowledge is observable and measurable; hence, examining individual behavior is paramount in the Post-Positivism Paradigm. The researcher interviewed principals to better understand their impact on ICT integration in schools. They also interviewed the County Quality Assurance Officer (CQUASO). The tool was appropriate since it gave the researcher the authority to ask oral questions to participants and make remarks that prompted respondents to provide data (Mugenda & Mugenda, 2012).

3.5. Observation Checklist

Kothari (2004) defines observational checklists as a research tool used to collect data by collecting and monitoring the variables under study to establish their behavior in a realistic setting. The checklist was used by the researcher to confirm the presence of IT in the school, as well as to determine whether the technologies were in excellent working order for classroom use.

3.6. Document Analysis

Document analysis is a systematic strategy that uses qualitative methods to study printed and electronic documents in a certain area. Corbin and Strauss (2008) characterize it as a cost-effective strategy for data analysis. That is why the researcher chose it for this study. The analysis comprised a review of the school's ICT regulations addressing the use of digital tools, an examination of the Kenya Certificate of Secondary Education (KCSE) results, and an evaluation of classroom attendance records.

3.7. Data Analysis

The study analyzed qualitative and quantitative data using descriptive statistics such as mean and standard deviation, as well as inferential statistics methods such as simple correlation to evaluate the correlations between all studied variables and multiple regression to assess the relationships between transformational leadership components as an independent variable and ICT adoption in teaching and learning as a dependent variable.

3.8. Logistical and Ethical Consideration

Logistical and ethical considerations are study principles that researchers must adhere to in order to avoid violating the rights of participants. In this study, the researcher obtained written agreement from the participants. The written consent assured the participants that the aim of the research in Kakamega was strictly academic and that they would stay anonymous. Individuals who choose to engage in scientific research should do so of their own accord and without any form of coercion or obligation (Creswell, 2014)

4. Results

4.1. Response Rate

The researcher got 132 completed surveys from 186 teachers, representing 71% of the total no. of participants, 276 completed questionnaires from 372 students, representing 74.1% of the total no. of participants, and 54 completed questionnaires from principals, representing 87% of the total no. of participants. Overall, there was a 74.51% response rate. The high-level return rate of the administered instruments supports Mugenda Mugenda's (2012) contention that a 50% return rate is reasonable, a 60% return rate is good and a 70% return rate is great in reporting the findings.

The descriptive findings (percentages, mean, and standard deviation) were assessed first, then a multi-regression analysis was performed. Under intellectual stimulation behavior, the researcher examined four constructs that were measured: Wi-Fi provision, faith in teachers' inventive abilities, consensus building and review of instructors' pedagogical skills. Each concept was assessed to determine the extent to which intellectual stimulation practice influences the use of ICT in teaching and learning. The results are reported in table 2.

Statements	Responses										Mean	Std. Dev
	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree			
	N	%	N	%	N	%	N	%	N	%		
Provide access to Wi-Fi in school without any restrictions.	0	0	1	1.9	27	50	11	20.4	15	27.8	3.74	0.894
I trust teachers' abilities when they apply their innovative skills to the learner's achievement.	0	0	2	3.7	25	46.3	23	42.6	4	7.4	3.54	0.693
Works towards consensus with the educators on ICT resources that must be prioritized in the school budget.	0	0	2	3.7	23	42.6	25	46.3	4	7.4	3.57	0.69
Encourage teachers to review their practices in Information Technology usage.	0	0	1	1.9	6	11.1	40	74.1	7	13	3.98	0.566

Table 2: Principals' Responses on Intellectual Stimulation on Integration of ICT in Teaching and Learning

The provision of Wi-Fi without restrictions is viewed positively by a significant portion of principals, with a relatively high mean score of 3.74 and a standard deviation of 0.894, suggesting general support for this approach. Teachers require the principal's help to have access to reliable Wi-Fi in order to use ICT. This access to the internet by other schools may result in a digital gap;

Internet access is part of the software in restructuring. Without adequate infrastructure, teachers may be demotivated, and this may hinder them from applying their innovative and creative ideas. This study is similar to the descriptive study conducted by Cherotich, Kamaku and Senaji (2022), which evaluated ICT infrastructure and digital literacy adoption in 87 public elementary schools in Nakuru County. Questionnaires were delivered to 87 managers and 87 technicians. One of their research issues was whether the teachers have access to the Internet in their respective schools. The findings found that ICT was critical for adoption in teaching and learning and that some schools had appropriate infrastructure while others struggled with low resources. The data found that 67% relied on mobile connectivity and 13% on wi-fi, which is beneficial because consumers could obtain information from multiple service providers. However, principals are recommended to commit to a single reliable mode of connectivity service.

Principals were asked about their trust in teachers' innovative abilities to enhance learner achievement. The results show a distribution where 25 (46.3%) were neutral, 23 (42.36%) agreed, and 4 (7.4%) strongly agreed. The mean score of 3.54 indicates a generally positive outlook among principals in this regard. When teachers' inventive abilities are fostered, they become more motivated and dedicated to using ICT in the classroom (Plom, Law & Quale, 2009; Zhou & Ren, 2011).

The responses to the consensus-building exercise of prioritizing ICT resources in the school budget were fairly and evenly split. 23 (42.6%) had a neutral view, 25 (46.3%) agreed, 4 (7.4%) strongly agreed and just 2 (3.7%) strongly opposed. This implies that a significant proportion of principals actively collaborate with educators to make decisions concerning ICT resource allocation, which gives a mean score of 3.57. Previous research, however, found that there were few technologies in some schools, with some equipment and software completely missing (Kidombo, Gakuu & Ndiritu, 2012; Cherotich, Kamaku & Senaji, 2022). The numerous obligations that Kenyan managers have may prevent them from consulting teachers about the type of infrastructure that would be best. It may also take some time to come to an agreement on ICT priorities, which could impede the use of ICT in the classroom Gyansah(2020).

Regarding the statement encouraging teachers to assess their methods in information technology usage, the majority of principals, 40 (74.1%), agreed, with 7 (13%) strongly agreeing, indicating significant support for the effort. The mean score of 3.98 suggests a high amount of encouragement offered by administrators to teachers to reflect on their information technology practices.

These findings indicate that principals in Kakamega encourage innovative teachers to be more novel. Principals who exhibit innovation attain their goals through their followers' hard work, loyalty, and a culture of active thinking (Anjali & Anand, 2015). Intellection stimulation is an effective method for incorporating ICT into the classroom since it is linked to the principal's transformational leadership (Muia, 2018). Positive leadership allows the instructor to gain the teachers' trust and encourage them to think beyond the box in their efforts to integrate ICT in the classroom.

4.2. Teachers' Responses

Under intellectual stimulation behavior, the researcher considered five constructs to which teachers had to respond. The responses were measured using a Likert scale comprising strongly agree, agree, neutral, disagree and strongly disagree.

Statements	Responses										Mean	Std. Dev
	Strongly Disagree		Disagree		Neutral		Agree		Strongly Agree			
	N	%	N	%	N	%	N	%	N	%		
I access the internet promptly at school without restrictions	0	0	5	3.8	55	41.7	52	39.4	20	15.2	3.66	0.78
The school principal has trust in my abilities and supports ICT usage in the in-classroom instructions	0	0	2	1.5	84	63.6	36	27.3	10	7.6	3.41	0.653
Teachers are asked about the type of hardware and software needed for teaching by the school principal.	1	0.8	5	3.8	105	79.5	18	13.6	3	2.3	3.13	0.53
The principal involves teachers in the decision-making process to improve the quality of classroom delivery in school	0	0	7	5.3	102	77.3	16	12.1	7	5.3	3.17	0.599
Teachers are stimulated to reflect upon the value of using ICT because of students' success.	0	0	2	1.5	53	40.2	68	51.5	9	6.8	3.64	0.633

Table 3: Teacher's Responses to Principals' Intellectual Stimulation on Integration of ICT in Teaching and Learning

Regarding the statement on accessing the internet promptly at school without restrictions, a significant number of teachers, 55 (41.7%), reported a neutral stance when asked if the school principal trusts their abilities and supports ICT usage in in-classroom instructions. While 52(39.4%) agreed and 20(15.2%) strongly agreed, a relatively small proportion 5(3.8%) disagreed, and no respondents strongly disagreed. These results show that while internet access was accessible to instructors in Kakamega and that they could use it in the classroom, the connection was constantly disrupted, according to observations, because of the erratic weather in the country's western area. The report emphasized the necessity for schools to improve internet access by utilizing dependable methods and sources of electricity such as generators and solar panels.

As for the statement on the school principal's trust in the teacher's abilities and support of ICT usage in the classroom, 85(63.6%) of teachers reported a neutral stance when asked if the school principal trusts their abilities and supports ICT usage in in-classroom instructions. 37 (27.3%) agreed, 2(1.5%) strongly agreed, 10(7.6%) disagreed, and no respondents strongly disagreed.

These findings indicate that teachers believed their principals did not completely trust their ability to use ICT. Transformational principals are required to support their teachers' use of ICT by providing them with appropriate ICT materials to allow them to be inventive.

The results align with Keller and Owen's (2018) quantitative study of 41 hospitals in the United States. The study investigated the level of confidence among healthcare workers in providing a positive patient experience and patients' evaluations of their treatment experience. The researchers found that there is a positive correlation between greater patient ratings and increased worker trust in the level of patient care. The manager's ability to engage, stimulate, motivate, and support teachers' creativity through the use of technology in the classroom earns them their trust. Yamamoto, Yamaguchi (2019)

In response to the statement, which inquired about teachers' involvement in decisions concerning hardware and software for teaching, 84(63.6%) of the respondents were neutral, while 36(27.3) % agreed, and 10(7.6%) strongly agreed. Only 2(1.5%) disagreed, and no respondents strongly disagreed. According to the findings, teachers considered they were not completely included in the decision-making process. However, this contradicts the findings of the document analysis, which revealed that teachers participated in ICT-related conversations, as demonstrated by staff minutes. Nonetheless, in Kenyan schools, teachers may debate in the staffroom, but the administrator makes the final decision. Leadership is not a one-man show; rather, it is about persuading others to work towards a common objective. In this sense, the principal should collaborate with teachers to integrate ICT in the classroom.

These findings are consistent with those of Obioma (2015), who distributed questionnaires to 216 organizational leaders from North American cities and states to investigate a method for understanding leadership decision-making in organizational leadership and management activities. Based on the findings of this analysis, organizational leaders ought to delegate authority to capable subordinates. The primary finding is that when teachers participate in decision-making, they are more likely to employ ICT tools in the classroom.

The fourth statement explored the extent to which principals involve teachers in decision-making processes to enhance classroom delivery quality. Here, 105(79.5%) of teachers had a neutral stance, 18(13.6%) agreed, and 10(7.6%) strongly agreed, highlighting a generally positive perception of involvement. 5(3.8%) disagreed, and only 1(0.8%) strongly disagreed.

The fifth statement addressed whether teachers are stimulated to consider ICT's value due to students' success. 16(12.1%) of teachers agreed, 102(77.3%) expressed a neutral stance and 7(5.3%) strongly agreed. No respondents strongly disagreed, and only 1.52% disagreed. This outcome is a reflection of the transformative principal's job, which is to excite teachers and increase their creative abilities by consulting on the types of software and hardware that can be incorporated into the classroom (Yamamoto & Yamaguchi, 2019).

4.3. Correlation Analysis for Intellectual Stimulation

The correlation analysis was done to establish the relationship between the independent variable (intellectual stimulation) and the dependent variable (ICT integration in the classroom).

	ICT Integration in Classroom	Intellectual Stimulation
ICT Integration in Classroom	1	
Intellectual Stimulation	.534**	1
N	.000	
	108	108

** Correlation is significant at the 0.01 level (2-tailed)

Table 4: Correlation Matrix for Intellectual Stimulation and ICT Integration

From the findings displayed in **Error! Reference source not found.**, there is a moderate positive and statistically significant relationship between intellectual stimulation and ICT integration in the classroom ($r(108) = 0.534, p < 0.001$).

4.4. Regression Analysis for Intellectual Stimulation

Regression analysis was conducted to establish the extent to which the predictor variable intellectual stimulation can be used to predict the response variable ICT integration in the classroom. The scale utilized was 0.10 to 0.29 for weak correlation, 0.30 to 0.49 for medium correlation, and 0.50 to 1.0 for strong correlation, as suggested by Cohen (1988) to measure the size effect. The percentage of variance in the dependent variable as a result of the independent variable was also determined. The results are recorded in Table 5.

R	R Square	Adjusted R Square	Std. Error of the Estimate
0.534	0.285	0.278	1.37036

Table 5: Model Summary for Intellectual Stimulation

In table 5, the R-squared value of 0.285 indicates that only 28.5% of the variability in ICT integration can be explained by variations in intellectual stimulation of principals, suggesting a weak predictive relationship. Therefore, 71.5% of ICT integration in the classroom was determined by other variables not included in the model.

Model		Sum of Squares	Degrees of Freedom	Mean Square	F	Sig.
1	Regression	79.206	1	79.206	42.178	0.00
	Residual	199.056	106	1.878		
	Total	278.262	107			

Table 6: Regression ANOVA for Intellectual Stimulation
Dependent Variable: Integration of ICT
Predictors (constant): Intellectual Stimulation

The regression Analysis of Variance (ANOVA) findings displayed in Table 6 showed that there is a statistically significant linear relationship between explanatory variable intellectual stimulation and ICT integration in the classroom since the P-value (Sig.=0.00) obtained was less than the level of significance of 0.001 ($F(1,106) = 42.178, p < 0.001$).

	Unstandardized Coefficients		Standardized Coefficients	T	Sig.
	B	Std. Error	Beta		
(Constant)	6.644	0.819		8.108	0.000
Intellectual Stimulation	0.536	0.083	0.534	6.494	0.000

Table 7: Regression Coefficients for Intellectual Stimulation

The regression coefficients displayed in Table 7 were used to develop a univariate regression model between the explanatory variable (intellectual stimulation) and response variable (ICT integration in the classroom). The model developed illustrated that the explanatory variable intellectual stimulation significantly influenced the response variable ICT integration in the classroom since its P-value of 0.000 was less than 0.001 (level of significance). The beta coefficient $\beta = 0.536$ implies that a unit change in the explanatory variable intellectual stimulation on the model will result in a 0.536 change in the response variable ICT integration in the classroom. Therefore, the null hypothesis is rejected, suggesting that there is a statistically significant relationship between Principals' Intellectual Stimulation and ICT integration in public secondary schools in Kakamega County.

5. Discussions

The main objective of this study was to examine the influence of principals' intellectual stimulation practices on teachers' utilization of information and communication technology in Kakamega, Kenya's public secondary schools. The results showed that the behaviour of principals influences the extent to which teachers employ ICT in their teaching and learning practices. Therefore, the Null hypothesis, which stated that the principal's intellectual stimulation had no significant influence on ICT integration, was rejected. Transformational leaders focus on working in consultation with followers to achieve organizational goals, resulting in increased teacher engagement (Ronoh, Iravo & Wanjala, 2020). During interviews, principals expressed their support for instructors by assigning them additional responsibilities that exceeded expectations. Principals who engage teachers win their confidence, as do teachers who voluntarily use ICT in their instructions. Nyaomitta, Namsonge, and Ahaya (2019) discovered a noteworthy correlation between intellectual stimulation and the performance of staff in Kenyan commercial banks. When the bank personnel received challenging assignments, motivation to enhance their skills, and feedback on their assigned duties, their productivity surged. Transformational leaders stimulate creativity by assigning objectives to their workers that motivate them to explore novel approaches and resolutions to challenges (Hall & Keilitz, 2012). Administrators boost teachers' confidence in their responsibilities by commending their inventive attributes.

Teachers have trust in leadership when the organizational goals match with their personal abilities. The findings align with the research conducted by Klinec, Polatanc, and Er (2022), who surveyed 611 teachers from 56 secondary schools in Turkey. Their study aimed to examine the impact of transformational leadership on teacher dedication and innovative practices. They discovered that trust in principals acted as a significant mediator of transformational leadership's indirect influence on teacher creative practice via teacher commitment. Teachers want to work in an environment that acknowledges and appreciates their skills. In such a situation, teachers' dedication and innovative approach are influenced by the level of trust they have in their principals.

Nevertheless, some studies have raised doubts regarding the significant influence of transformational leadership on the incorporation of ICT in the process of teaching and learning. They argue that the leader's conduct on the four aspects of idealized influence, inspirational motivation, intellectual stimulation, and individualized consideration function independently. Kitur (2021), for example, discovered that idealized influence and individual care had a significant impact on performance, whereas inspiring motivation and intellectual stimulation had no statistically significant relationship with KCSE outcomes. Consequently, transformational leaders must empower teachers by effectively communicating with them, fostering trust through engagement and delegation of responsibilities, and motivating them to think creatively and find solutions to problems. Hasija, Hyde, and Kushwaha (2019) conducted a comparable study on the impact of transformational leadership traits on employee performance within the Malaysian hotel industry. Only two aspects of transformational leadership, specifically idealized influence and inspired motivation, were discovered to have a notable and beneficial impact on employee performance.

6. Limitations and Recommendations

Since the study was done in Kenya, its conclusions are limited to the geographical area of Kenya, and hence, the findings cannot be extended to other areas. The target population comprised 67 public county secondary schools, which may not have enough influence on the research problem. Hence, the study suggests that future researchers should incorporate both public and private schools at the sub-county level in their study, as the influence of ICT and leadership is pervasive. The study utilized the framework of the transformational leadership approach. Future research should investigate various leadership approaches that could impact the integration of ICT in teaching and learning.

7. Conclusion

The researchers conducted a thorough empirical review and examined the theory that drives transformational leadership and teachers' use of ICT in teaching and learning. We concluded that the incorporation of ICT into teaching and learning is dependent on the principal's actions. As a result, the null hypothesis was rejected, whereas the alternative hypothesis was accepted.

H02: Principals' intellectual stimulation has a considerable influence on ICT integration in public secondary schools in Kakamega County.

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