EFFECTIVENESS OF SYSTEM AUTOMATION ON TAX GOVERNANCE IN UASIN GISHU COUNTY KENYA

MICHAEL BARASA

A THESIS SUBMITTED IN PARTIAL FULFILMENT OF THE REQUIREMENTS FOR THE AWARD OF A MASTER OF SCIENCE DEGREE IN GOVERNANCE, PEACE, AND SECURITY OF AFRICA NAZARENE UNIVERSITY

JUNE, 2026

DECLARATION AND APPROVAL

Declaration by the Student

This thesis is my original work and has not been presented for a degree in any other University or for other award.

Signature_____ Date: 30/06/2026

MICHAEL BARASA SIKHANGA

21S01DMGP013

Approval by University Supervisor

We confirm that the candidate under our supervision has conducted the work reported in this thesis.

Signature.....Date.....30th June, 2026

Professor Elijah siringi .Phd.

Nazarene university

Signature..... Date.....30/6/2026

Dr. John Kamau

Nazarene University

ABSTRACT

In Kenya, county governments have been making substantial investments in digital revenue management systems to help them increase the efforts of own-source revenue collection, but persistent variation in revenue performance indicates that technological adoption alone might not automatically translate into improved tax governance. Even though the Integrated Revenue Management Information System (IRMIS) was implemented in Uasin Gishu County, the issues with the integrity of reconciliation, compliance behavior, and the efficiency of the collection remain obvious. This paper therefore examined how automation of systems affects tax governance in Uasin Gishu County, Kenya and the moderating role of tax education in this relationship. In particular, the researchers evaluated the effects of online process automation, transaction automation, and reconciliation and control automation to the outcomes of tax governance, determined by the efficiency of revenue collection and tax compliance. The research was anchored on Digital Transformation Theory, which argues that standardized system execution promotes transparency and less discretion, and Process Automation Theory, which asserts that standardized system execution ensures transparency and less discretion. A cross-sectional survey design was used that was explanatory in nature and was conducted within the last twelve months. A stratified random sample of 200 out of a target population of 415 respondents was chosen and 181 out of 200 respondents were able to complete the questionnaires and submit them back, which is a 90 percent response rate. The analysis of data was based on the descriptive statistics, Pearson correlation analysis, and multiple linear regression estimated using Ordinary Least Squares with diagnostic tests to ensure robustness. The results of correlation indicated that there were positive and statistically significant relationships between online process automation ($r = 0.405$, $p < 0.01$), transaction automation ($r = 0.354$, $p < 0.01$), reconciliation and control automation ($r = 0.649$, $p < 0.01$), tax education ($r = 0.658$, $p < 0.01$), and tax governance. Automation and education were joint predictors of tax governance, with 54.1 percent of the variance in tax governance explained ($R 2 = 0.541$, $F = 51.915$, $p < 0.001$). Diagnostic reports confirmed that the data were normal, no multicollinearity (VIF range = 1.2951.484), and homoscedastic residues. The researchers have concluded that the main determinants of tax governance in devolved revenue systems are reconciliation and control automation and tax education. It suggests that internal automated controls should be increased, system integration and reconciliation features should be enhanced, and continuous taxpayer education programs should be institutionalized in order to maximize governance results. Future studies need to embrace longitudinal and comparative multi-county design, mix-methodological studies, and the emergent technologies including artificial intelligence-based revenue analytics to enhance the current understanding of the digital tax governance within the devolved system of Kenya.

TABLE OF CONTENTS

DECLARATION AND APPROVAL ..... **i**
ABSTRACT ..... **ii**
TABLE OF CONTENTS ..... **iii**
DEFINITION OF TERMS ..... **vii**
ABBREVIATIONS/ ACRONYMS ..... **ix**
LIST OF TABLES ..... **x**
CHAPTER ONE **1**
INTRODUCTION **1**
1.0 Introduction 1
1.1 Background of study 1
1.2 Statement of the Problem 4
1.4 Purpose of the Study 6
1.5 Objectives of the Study 6
1.5.1. Main Objectives 6
1.5.2 Specific Objectives 6
1.6 Research Questions 6
1.7 Significance of the study 7
1.8 Scope of the Study 8
1.9 Limitations of the Study 9
1.10 Delimitations of the Study 9
1.11 Assumptions of the Study 10
1.12 Theoretical Framework 10
1.12.1 Digital transformation theory 11
1.12.2 Process automation theory 12
1.13 Conceptual Framework 13
CHAPTER TWO **15**
LITERATURE REVIEW **15**

2.1 Introduction 15
2.2: Review of Literature 15
2.2.1 Online Process Automation and Tax Governance 15
2.2.2 Transaction Automation and Tax Governance 17
2.2.3: Reconciliation and Control Automation on Tax Governance 19
2.2.4 Combined effects of Online Process Automation, Transaction Automation, Reconciliation and Control Automation ..... **Error! Bookmark not defined.**
2.2.5 Moderating Effect of Tax Education on the Relationship between Systems Automation on Tax Governance 24
2.3 Summary and Research Gaps 27
CHAPTER THREE 31
RESEARCH METHODOLOGY 31
3.1 Introduction 31
3.2 Research Design 31
3.3 Research Site 32
3.4 Target Population 33
3.5 Study Sample 34
3.5.1 Sampling Procedure 34
3.5.2 Study Sample Size 34
3.6: Data Collection 35
3.6.1 Data Collection Instruments 35
3.6.2 Pilot Testing of Research Instruments 36
3.6.3 Instrument Reliability 37
3.6.4 Instrument Validity 37
3.6.5 Data Collection Procedures 38
3.7 Data Analysis 38
3.7.1: Qualitative Data Analysis 39
3.7.2: Quantitative Data Analysis 39
3.7.3: Diagnostic Tests and Reporting 41
3.8 Legal and Ethical Considerations 41
CHAPTER FOUR 43

DATA ANALYSIS RESULTS AND DISCUSSIONS..... 43
4.1 : Introduction 43
4.2 : Response Rate 44
4.3 : Validity and Reliability Tests 45
4.3.1 : Reliability Tests 45
4.3.2 Validity Tests..... 46
4.4 : Demographic Analysis 48
4.4.1 : Gender of the Respondents 49
4.4.2 : Age of the Respondents 49
4.4.3 : Respondents' Level of Education 51
4.4.4 : Role in the County Government 52
4.4.5 : Years of Experience with County Revenue Processes 54
4.4.6 : Workstation/Revenue Stream..... 55
4.5 : Descriptive Statistic 56
4.5.1 : Online Process Automation..... 56
4.5.2 : Transaction Automation 58
4.5.3 : Reconciliation and Control Automation 59
4.5.4 : Tax Education 61
4.5.5 : Tax Governance 62
4.6 : Diagnostic Tests 64
4.6.1 : Normality Test 65
4.6.2 : Multicollinearity Test..... 68
4.6.3 : Homoscedasticity Test 68
4.7 : Bivariate Linear Correlation Analysis..... 69
4.8 : Multiple Regression Analysis 72
4.8.1 : Model Summary 72
4.8.2 : Analysis of Variance 74
4.8.3 : Regression Coefficients 76
4.9.1 : Moderated Model Goodness of Fit (Interaction between Tax Education Systems Automation) 79
4.9.2 : Moderated Model Analysis of Variance (ANOVA)..... 80

4.9.3 : Moderated Regression Coefficients (Systems Automation × Tax Education)..... 82
CHAPTER FIVE 85
SUMMARY, CONCLUSION AND RECOMMENDATIONS 85
5.1 : Introduction 85
5.2 Summary of Findings 85
5.3 Discussion of Findings 87
5.4 : Conclusions 89
5.5 : Recommendations 91
5.6 : Recommendations for Further Studies 93
REFERENCES 95
APPENDICES 99
APPENDIX I: QUESTIONNAIRE 99
APPENDIX II: ESTIMATED RESEARCH BUDGET 105
APPENDIX III: UNIVERSITY APPROVAL LETTER 106
APPENDIX IV: NACOSTI 107
APPENDIX V: MAP OF UASIN GISHU COUNTY 109

DEFINITION OF TERMS

Accountability (Tax Governance Sub-Index): The extent to which revenue administration actions can be monitored, traced, and attributed to responsible officers through audit trails, transaction logs, and compliance monitoring mechanisms.

Audit Trail: A chronological, tamper-evident digital record of system events or transactions that supports verification, monitoring, and oversight in information systems and audit practice.

Integrity and Control (Tax Governance Sub-Index): The extent to which the revenue administration system safeguards transactions and data against manipulation, fraud, errors, or unauthorized access through automated controls and validation mechanisms.

Administrative Efficiency (Tax Governance Sub-Index): The extent to which revenue administration processes are completed accurately, consistently, and within reasonable time and resource constraints through automated workflows and streamlined procedures.

E-Payment Integration (IV3): Linking cashless channels such as mobile money, cards, EFT/RTGS, USSD, or QR platforms to the revenue system to enable automated payment posting, verification, and reconciliation.

E-Receipting (IV2): Electronic issuance of secure, tamper-proof receipts with unique identifiers that update taxpayer accounts and revenue records in real time.

Integrated Revenue Management Information System (IRMIS): A county-level digital platform supporting taxpayer registration, assessment, billing, receipting, collection, reporting, and monitoring within Kenya's devolved revenue administration framework.

Online Process Automation (IV1): End-to-end digitization of revenue administration processes including registration, assessment, approvals, billing, and case handling through automated electronic workflows.

Procedural Compliance (Tax Governance Sub-Index): The extent to which revenue administration activities adhere to established laws, regulations, policies, and operational procedures.

Registration Coverage (Tax Governance Sub-Index): The extent to which eligible taxpayers, businesses, properties, and revenue sources are captured and maintained within the revenue management system.

Reconciliation Variance: The discrepancy between revenue amounts recorded in the digital system and the totals reflected in bank statements or financial records.

System Automation: The use of digital technologies to execute structured, rule-based administrative tasks with minimal human intervention, generating verifiable audit trails and strengthening process control.

Tax Governance (DV): The effectiveness of revenue administration systems in promoting administrative efficiency, accountability, integrity, registration coverage, and procedural compliance within county governments.

Taxpayer Education (Moderator): Programs such as training, outreach, helpdesks, user guidance, and awareness campaigns that enhance taxpayers' understanding of tax obligations and the use of automated revenue systems.

Transparency (Tax Governance Sub-Index): The extent to which revenue administration processes, transactions, and records are visible, accessible, and verifiable through real-time reporting, electronic records, and audit trails.

Reduced Discretion (Tax Governance Sub-Index): The extent to which automated systems minimize subjective human intervention by standardizing procedures, applying uniform rules, and reducing manual decision-making.

ABBREVIATIONS/ ACRONYMS

Abbrev	Meaning
ICT	Information and Communication Technology
IRMIS	Integrated Revenue Management Information System
OSR	Own-Source Revenue
KRA	Kenya Revenue Authority
NACOSTI	National Commission for Science, Technology and Innovation
eTIMS	Electronic Tax Invoice Management System
OLS	Ordinary Least Squares (regression)
KMO	Kaiser–Meyer–Olkin (sampling adequacy test)
CFA	Confirmatory Factor Analysis

LIST OF TABLES

Table 4.1: Reliability Coefficients 45

Table 4.2: Role in the County Government 52

Table 4.3: Workstation/Revenue Stream 55

Table 4.4: Online Process Automation 56

Table 4.5: Transaction Automation 58

Table 4.6: Reconciliation and Control Automation 60

Table 4.7: Moderating Effect of Tax Education 61

Table 4:8 Tax Governance 62

Table 4.10: Tests of Normality 65

Table 4.11: Collinearity Statistics 68

Table 4.12: Bivariate Linear Correlation Analysis 69

Table 4.13: Model Summary 72

Table 4.14: ANOVA 74

Table 4.15: Regression Coefficients 76

Table 4.16: Model's Goodness of Fit Statistics (Interaction between Tax Education and Systems Automation) 79

Table 4.17: Moderated ANOVA 80

Table 4.18: Moderated Regression Coefficients (Systems Automation × Tax Education) 82

LIST OF FIGURES

Figure 4:1 Response Rate 44

Figure 4.2 Gender of the Respondents 49

Figure 4.4: Age of the Respondents 50

Figure 4.5: Respondents Level of Education 51

Figure 4:5 Years of Experience with County Revenue Processes 54

Figure 4.7: Normality plot 66

Figure 4.8: Standardized Residual 66

Figure 4.9: Detrended Q-Q Plot of Standardized Residual 67

CHAPTER ONE

INTRODUCTION

1.0 Introduction

This chapter presents the background of the study, the statement of the problem, the purpose of the study, the research objectives, research questions, significance of the study, scope, delimitations, limitations, assumptions, and the theoretical and conceptual frameworks underpinning the study. The study examines the effect of systems automation, defined as the use of digital technologies to automate revenue administration processes; tax education, which refers to initiatives aimed at improving taxpayers' knowledge and compliance with tax obligations; and tax governance, which encompasses the transparency, accountability, administrative efficiency, integrity, and compliance of revenue administration within county governments. The chapter concludes by outlining the theoretical and conceptual foundations that guide the investigation of these variables in Uasin Gishu County, Kenya.

1.1 Background of study

Globally, governments have increasingly embraced digital technologies to enhance public revenue administration, improve tax compliance, strengthen accountability, and promote efficient service delivery (Vial, 2019). System automation has transformed revenue management processes by integrating taxpayer registration, assessment, billing, payment, receipting, reconciliation, reporting, and audit functions into unified digital platforms. Advanced economies such as Estonia, Australia, the United States, and Canada have implemented highly automated tax administration systems characterized by electronic filing, automated payment processing, real-time reconciliation, and integrated reporting systems. These reforms have significantly reduced administrative costs, minimized processing errors, enhanced auditability, and improved voluntary tax compliance (Espinosa & Pino, 2024; Hesami, Jenkins, & Jenkins, 2024). Similarly, several European countries have adopted digital tax reforms such as the United Kingdom’s Making Tax Digital programme and Italy’s electronic invoicing system, both of which have strengthened transparency, reporting accuracy, and governance within tax administration systems (Alshawi, Alalwany, & Cherif, 2020; Ainsworth & Shact, 2020).

Across Africa, system automation has emerged as a critical strategy for addressing longstanding challenges associated with revenue leakages, weak compliance, administrative inefficiencies, and

inadequate audit trails. Evidence from Nigeria, Rwanda, South Africa, Uganda, and Ghana demonstrates that automation can improve revenue performance, accelerate reconciliation processes, enhance traceability of transactions, and strengthen compliance monitoring when implemented alongside appropriate institutional support mechanisms (Okunogbe & Santoro, 2023; Madunezim *et al.,* 2023; Santoro & Waiswa, 2024; Honorine, 2025). However, studies across the continent also indicate that the effectiveness of automation depends not only on technology adoption but also on implementation quality, institutional capacity, and user readiness. Consequently, successful automation initiatives require complementary interventions that promote user acceptance, operational consistency, and effective utilization of digital systems.

In Kenya, both national and county governments have increasingly invested in digital revenue management systems to strengthen public financial management and improve own-source revenue collection. At the national level, initiatives such as the Electronic Tax Invoice Management System (eTIMS) have enhanced transparency, reduced compliance gaps, and improved taxpayer monitoring. At the county level, digital revenue platforms such as Nairobi Pay and Sisibo Pay have been introduced to automate revenue streams including business permits, market fees, parking charges, property rates, and other local levies (Onwonga, 2024). County fiscal reviews indicate that integrated payment systems and automated collection platforms have contributed to improvements in revenue administration and reporting (World Bank, 2024). Nevertheless, audit reports continue to highlight challenges relating to reconciliation variances, incomplete audit trails, parallel manual processes, and inconsistencies between system-generated records and financial statements, suggesting that automation alone may not be sufficient to achieve desired governance outcomes (Office of the Auditor-General, 2025).

System automation refers to the use of digital technologies to execute structured administrative functions with minimal human intervention while generating verifiable records and standardized workflows. Within revenue administration, automation encompasses online process automation, electronic receipting, electronic payment integration, automated reconciliation, and digital reporting systems. These technologies enhance operational efficiency by reducing processing delays, minimizing manual errors, strengthening audit trails, and improving transaction traceability (Estifanos, 2023; Nandan Prasad, 2024). Through automated workflows and integrated controls, system automation is expected to strengthen governance by promoting transparency, accountability, consistency, and compliance within revenue administration systems.

However, the effectiveness of automated systems largely depends on the ability of users to understand and utilize digital platforms correctly. Tax education therefore plays a critical role in supporting digital transformation within tax administration. Tax education comprises awareness campaigns, taxpayer sensitization programmes, training initiatives, helpdesk support services, and simplified guidance materials aimed at improving understanding of tax obligations and administrative procedures. Existing literature suggests that informed taxpayers are more likely to comply voluntarily, utilize digital platforms effectively, and participate in transparent revenue administration processes (Kirchler, Hoelzl, & Wahl, 2022; Gangl, Hofmann, & Kirchler, 2022). Similarly, adequately trained revenue officers are better equipped to manage automated systems, resolve system exceptions, and enforce procedures consistently. Consequently, tax education is increasingly viewed as an important enabling factor that enhances the effectiveness of digital tax reforms and strengthens governance outcomes.

Tax governance represents the effectiveness of institutional arrangements, administrative procedures, and control mechanisms used in the administration of public revenues. It encompasses transparency, accountability, administrative efficiency, integrity, and compliance in revenue management processes (Okunogbe & Santoro, 2023). Effective tax governance promotes public confidence, minimizes opportunities for revenue leakages, enhances accountability, and supports sustainable revenue mobilization. Recent literature identifies system automation as a key enabler of tax governance because digital technologies strengthen traceability, reduce discretionary decision-making, improve reconciliation processes, and facilitate real-time monitoring of revenue transactions (Hesami et al., 2024). Nevertheless, the benefits of automation are often influenced by contextual factors such as institutional capacity, user adoption, and taxpayer awareness.

Uasin Gishu County provides an appropriate context for examining these relationships. As one of Kenya's economically vibrant counties, it manages diverse revenue streams generated from business activities, markets, parking services, property-related charges, and other local revenue sources. The county has implemented the Integrated Revenue Management Information System (IRMIS) as part of broader efforts to modernize revenue administration and improve governance outcomes. Despite these reforms, evidence from county reports and previous studies indicates persistent challenges relating to compliance, reconciliation variances, administrative efficiency, and revenue performance (Kirui & Mose, 2024; Otuke, 2023). Existing literature has largely focused on revenue collection performance and technology adoption, with limited attention given

to how tax education influences the relationship between system automation and tax governance within devolved governments. This study therefore seeks to examine the effectiveness of system automation on tax governance in Uasin Gishu County and determine the moderating role of tax education in this relationship.

1.2 Statement of the Problem

System automation as the mechanism of facilitating improvement of the own-source revenue administration, minimizing leakages, and increasing the compliance with the local tax requirements has become a growing interest of the county governments in Kenya (Otuke, 2023). It has been suggested that digital revenue systems can be used as a means of enhancing the transparency, accountability, efficiency and integrity in the county tax administration through standardized procedures, reduced discretion as well as an enhanced audit trail. As part of this reform agenda, Uasin Gishu County has launched an Integrated Revenue Management Information System (IRMIS) to streamline the key revenue processes, including assessment, billing, receipting, payment, and reconciliation (Kirui & Mose, 2024).

Although Uasin Gishu County has made substantial investments in automation and digital reforms, the revenue performance has been inconsistent over the past few years (Controller of Budget, 2024). During the 2021/22 financial year, the county collected an amount of around KES 858.34 million as compared to a target of KES 1,414.92 million (about 60.7% achievement). In 2022/23, it realized KES 936.61 million against a target of KES 1,400.47 million (roughly 66.9% achievement). Despite performance improvements in 2023/24, with KES 1,421.33 million distributed against a planned KES 1,578.15 million (approximately 90.1% of target), revenue is still short of meeting the planned objectives completely. There are also early indications of 2024/25 showing the collection of KES 1,243.44 million against a KES 1,474.15 million budgeted target (≈ 84.3% achievement) suggesting that despite the digitization efforts, the full collection of revenue targets remains elusive (Afro Analytics, 2024). These trends raise question of the stability of the system automation to provide better results in the field of tax governance, such as better efficiency, compliance integrity, transparency, and accountability.

The big question is not necessarily the realization of automated systems but the skepticism on whether it will be effective to bring about stronger tax governance as is actually experienced and used by revenue officers and taxpayers. It has been demonstrated in the past that digital tools can

be utilized to improve the control environments, reduce the administrative discretion and improve auditability when processes are fully digitized and applied on a regular basis. However, the advantages appear to be dependent on the standard of implementation, the rate of system usage, organizational ability, and user potential (Shankar *et al.,* 2021). In particular, automation success may be limited to areas where taxpayers and frontline officers lack adequate knowledge, guidance or confidence to use digital systems in an appropriate manner.

The broader literature has found tax education as a potentially significant facilitating factor to successful tax administration reforms. Support programs and education can impact the way taxpayers and administrators perceive the needs of digital transformation, make full transactions, and adhere to standard procedures. The potential beneficial role of automated systems in governance could be limited because without proper tax education, these systems may not be fully utilized, abused, or supplemented with informal practices (Nikidehaghani *et al.*, 2022). Nevertheless, there is little empirical research on the interaction between tax education and system automation to create an outcome on tax governance at the county level in Kenya.

The majority of current research in Kenya is centered around national tax collection or current cross-county studies that are typically centered around revenue collection or technology adoption in general. These studies seldom separate the impacts of a particular automation component within a unitary county environment such as online process automation, electronic receipting and electronic payment integration. Further, little efforts have been made to investigate whether tax education pre-conditions or moderates the association between system automation and tax governance outcomes in devolved governments. As a result, the policymakers and the county managers are not in a position to provide context-specific evidence on whether and under what conditions investments in automation and education can translate into better tax governance.

It is on this basis that this research paper focuses on the Uasin Gishu County to study the effect of automating systems on tax governance and to determine the moderating role of tax education in this relationship. As the centre of major revenue-generating activities and administrative operations, The County provided an appropriate context for assessing how system automation and tax education influence tax governance outcomes. By filling this gap, the study aimed at generating evidence that can be used to inform more focused and effective county-level solutions to strengthening tax governance using integrated technological and educational interventions.

1.4 Purpose of the Study

The purpose of this study was to examine the effect of system automation on tax governance in Uasin Gishu County, Kenya, with particular focus on the moderating role of tax education in this relationship.

1.5 Objectives of the Study

The objectives guide the inquiry by linking the independent variables of automation to the outcomes of collection efficiency on tax compliance, while testing whether education strengthens these effects in the operating context of Uasin Gishu County.

1.5.1. Main Objectives

The main objective of this study was to examine the effectiveness of systems automation on tax governance in Uasin Gishu County, Kenya. The study further sought to determine the moderating effect of tax education on the relationship between systems automation and tax governance

1.5.2 Specific Objectives

i. To determine the effectiveness of online process Automation and tax governance in Uasin Gishu County, Kenya
ii. To examine the effectiveness of transaction automation and tax governance in Uasin Gishu County, Kenya
iii. To assess the effectiveness of reconciliation, control automation and tax governance in Uasin Gishu County, Kenya
iv. To evaluate the moderating effect tax education on the relationship between systems automation and tax governance in Uasin Gishu County, Kenya

1.6 Research Questions

i. To what extent does online process automation influence tax governance in Uasin Gishu County Kenya
ii. How does Transaction automation influence tax governance in Uasin Gishu County, Kenya
iii. What is the influence of reconciliation and control automation on tax governance in Uasin Gishu County, Kenya
iv. .What is the moderating effect of tax education in the relationship between systems automation and tax governance in Uasin Gishu County, Kenya

1.7 Significance of the study

This research is important in a number of interdependent ways, adding to the scholarly discourse, policymaking, the practice of administration, and research in the field of tax governance and digital public finance.

In terms of academic contribution, the research is a contribution to the existing body of literature on tax governance because it gives an empirical evidence on a devolved government context. Although available literature on systems automation and taxation has mostly focused on national tax collection agencies or on the outcomes of revenue performance, very little empirical research has been done to understand how automation incurs influence on tax governance at the county level in Kenya. Conceptualizing tax governance as a multidimensional outcome that is manifested by revenue collection efficiency and tax compliance in sub-national governments, the study contributes to the understanding of how digital reforms can shape the attributes of good governance, such as transparency, accountability, and administrative effectiveness in sub-national governments. Moreover, the study enhances the operationalization of the measurement of systems automation by refining it with distinct yet complementary dimensions, thus providing methodological clarity to the debates around how digital transformation in public administration should be empirically studied.

It is also believed that the findings of this study would offer evidence-based information to county governments, county assemblies and national oversight institutions that take part in the management of public finance. Since county governments are continuously investing large amounts of resources in Integrated Revenue Management Information Systems, policymakers should be aware of what clear evidence is available on whether such investments will result in improved tax governance or simply increased technological complexity. The findings of the study would be used to inform the decisions relating to the design, prioritization, as well as sequencing of the automation reforms, especially in regards to enhancing the digital revenue settlement and reconciliation controls. This is the evidence that will be used in shaping the county revenue policy, regulatory frameworks, and guidelines which will be working towards the enhancement of the transparency, accountability and sustainability of the own-source mobilization of revenues.

The research is also significant to the practitioners particularly the county revenue administrators, finance officers and system managers in charge of day to day revenue activities. The study also

gives a good piece of information on where the resources and attention of the manager should be given as it identifies the dimensions of systems automation that are most closely associated with the effectiveness of the revenue collection and tax compliance. The results can be used by counties to reduce the reconciliation variances, improve the settlement timeliness, and improve compliance management. To this extent, the research will offer practical recommendations that will go beyond system adoption to provide insights into how automation should be employed in achieving meaningful governance results.

Methodologically, the research is valuable in showing how to deal with some common empirical issues in digital governance research, including overlapping elements of automation, and the complexity of measurement. The study provides a systematic framework, which can be replicated or adjusted in other similar county or sub-national environments. This methodology increases the strength of the empirical analysis and is still based on the realities of operation of the administration of public revenue.

Lastly, the research is important to future research as it highlights the role of studying digital reforms based on governance analysis and not necessarily through revenue performance measures. The results will most likely trigger the further investigation of the relationship between institutional capacity, system design and control mechanisms and the impact of digital technologies on tax governance outcomes. In this respect, the research forms a basis on which future research on digital taxation, public financial management and reforms of governance concerning devolved systems in Kenya and other similar jurisdictions may be conducted.

1.8 Scope of the Study

This paper is limited to the evaluation of the systems automation on tax governance in Uasin Gishu County. The research is also limited to analyzing the moderating role of tax education to the relationship between automation of systems and tax governance. This narrowed geographical scope is based on deliberate selection of this county since it has already implemented the Integrated Revenue Management Information System (IRMIS), thus a practical case to study the role of automation in tax administration. The population of the study is confined to revenue officers, county officials, wholesalers and distributors who are directly involved with the system of revenue collection.

The study covers the period from 2020 to 2025 financial years, during which the county continued to implement and utilize automated revenue management systems. The study is limited to the Uasin Gishu County, Kenya due to the resource constraints, time constraints and accessibility barriers. Moreover, the study period will be restricted to the financial years within which automation has been in practice in the county, to enable an in-depth analysis. These limits make sure that the research is manageable, cost-effective, and context-specific and yet offers meaningful insights.

1.9 Limitations of the Study

This study is expected to have several limitations. First, the use of self-reported responses of respondents can be subjected to bias, because respondents might give socially desirable responses as opposed to giving true responses. To reduce this, the researcher will assure the respondents of confidentiality and anonymity. Second, issues of accessibility might be experienced especially with regard to accessing some respondents because of their tight schedules or unwillingness to disclose information. This will be addressed by flexible scheduling and follow-ups.

Third, the scope of the data collection process may be restricted by the resource and time constraints, which does not allow working with the larger sample sizes or the longer time-series data. To overcome this, the researcher will use stratified random sampling, to make the sample representative of the target population. Finally, the data collection process could be impacted by external factors, including changes in county policies, economic fluctuations, or other unforeseen events, such as strikes. Although the researcher cannot control these, triangulation of data sources will be employed so as to reduce their effects on the findings.

1.10 Delimitations of the Study

The study is narrowed down to the Uasin Gishu County and the stakeholders of the Uasin Gishu County who are actively engaged in collection and compliance of tax in the Uasin Gishu County. It does not apply to other counties, national tax authorities like the Kenya Revenue Authority (KRA), and non-county taxpayers. All these exclusions are intentional since including them would expand the scope beyond what is possible within the available resources, and may not offer directly relevant information about county-level revenue automation.

Also, the study will not focus on the more macroeconomic sources of these changes like inflation, interest rates or political impacts on taxation. These are recognized to be important but are regarded

to be out of the immediate interest of the study. The research is succinct, viable and has direct applicability to the county government context by narrowing the variables.

1.11 Assumptions of the Study

This study assumes that the respondents, such as county employees, wholesalers and distributors, will give honest, accurate, and reliable information about their experiences with system automation in revenue collection. The study also assumes that the Integrated Revenue Management Information System (IRMIS) is operational and accessible throughout the study period and that the processes are as to the level of automation in the Uasin Gishu County. It is also assumed that the sample is representative of the greater population of stakeholders in County revenue administration, which means that the results of the sample can be reasonably extrapolated to the County level. Lastly, the study assumes that factors that may hinder its data collection, like system downtime, network failure or other in-between disruptions of the system, will not have significant impacts on the data collection or the validity of findings.

1.12 Theoretical Framework

The theories used are Digital Transformation Theory and Process Automation Theory, which give a solid foundation for analyzing the relationship between system automation and tax governance. The two theories are complementary in nature, Digital Transformation Theory presents a strategic view that digital technologies are transforming organizational structures, decision-making and governance processes, and Process Automation Theory provides an operational view of how automation can improve process efficiency, consistency, and control.

While Digital Transformation Theory focuses on the value of integrated digital systems, Process Automation Theory explains the measurable value of the governance outcomes, namely by providing standardized workflow, less human discretion, better traceability and better process reliability with specific automation functionalities. The former describes the larger scale institutional change that can be attributed to digitalisation, and the latter the process-level pathways in which change is realised. Combined, the two theories offer a unified framework for the analysis of the benefits of e-process automation, e-receipting, and e-payment integration to the County's tax governance in the revenue administration process.

1.12.1 Digital transformation theory

Digital Transformation Theory was first of all articulated by Vial (2019) and is based on earlier research by Bharadwaj, El Sawy, Pavlou, and Venkatraman (2013), who conceptualized the idea of digital transformation as the strategic application of digital technologies to fundamentally redesign organizational processes, structures, and decision-making routines. The theory posits that the gains in performance are not due to the adoption of technology solely, but the intentional reconfiguration of how work is organized and executed in such a way that information is produced in real time, that is, it is shared across functional boundaries and integrated into operational and control decision making (Çıdik and Boyd, 2022).

The main assumption in the theory is that digital technologies can only create value when embedded in end-to-end processes, supported by robust data governance frameworks, and accompanied by organizational capabilities that ensure that users can effectively interpret and take action on digital information (Schenk, 2025). In this way, digital transformation is perceived as a socio-technical process which integrates technology, people and institutional arrangements.

Regarding this research, the Digital Transformation Theory can be used to develop a theoretical framework to analyze the effects of system automation on tax governance in Uasin Gishu County. The theory justifies the intuitive explanations as to why automation of online processes is likely to improve the efficiency of collections and payment of taxes, by replacing the fragmented manual processes by integrated digital processes, which standardize the assessments, approvals and reminders (Hesami *et al*., 2024). It also reasons why electronic receipting, by using verifiable digital identifiers, should add value to the integrity of the reconciliation and foster timely payment by providing immediate and reliable evidence of transactions not only to taxpayers but also to revenue officers.

Despite its strong explanatory power, Digital Transformation Theory has several limitations. First, the theory assumes that organizations possess the institutional capacity, technological infrastructure, financial resources, and digital competencies necessary to implement and sustain digital transformation successfully. In practice, many public sector institutions, particularly within devolved governments in developing countries, continue to experience challenges related to inadequate ICT infrastructure, resistance to organizational change, limited technical expertise, and resource constraints, which may impede the realization of anticipated digital benefits.

Furthermore, the theory predominantly emphasizes organizational and technological transformation while paying comparatively less attention to behavioural and contextual factors, such as taxpayer awareness, user acceptance, and institutional culture, which may significantly influence the effectiveness of digital systems. Consequently, although Digital Transformation Theory provides a robust framework for explaining how integrated digital technologies can improve organizational performance, it does not sufficiently account for the moderating influence of human and institutional factors. This limitation justifies the inclusion of tax education as a moderating variable in the present study, since taxpayer knowledge and user capability are expected to strengthen the relationship between systems automation and tax governance within Uasin Gishu County.

In addition, Digital Transformation Theory explains how the integration of electronic payment platforms with banking systems and mobile money channels can enhance tax administration by reducing the time lag between tax assessment, payment, and revenue realization. Such integration minimizes manual handoffs, processing delays, and reconciliation errors, thereby improving operational efficiency, transparency, and accountability in revenue collection (Hesami et al., 2024; Schenk, 2025). The theory further posits that the greatest organizational benefits are achieved when digital technologies are implemented as an integrated ecosystem rather than as isolated applications (Vial, 2021; Verhoef et al., 2021). Accordingly, this study adopts the theory to explain how the coordinated implementation of online process automation, electronic receipting, and electronic payment integration can generate synergistic improvements in tax governance within Uasin Gishu County.

1.12.2 Process automation theory

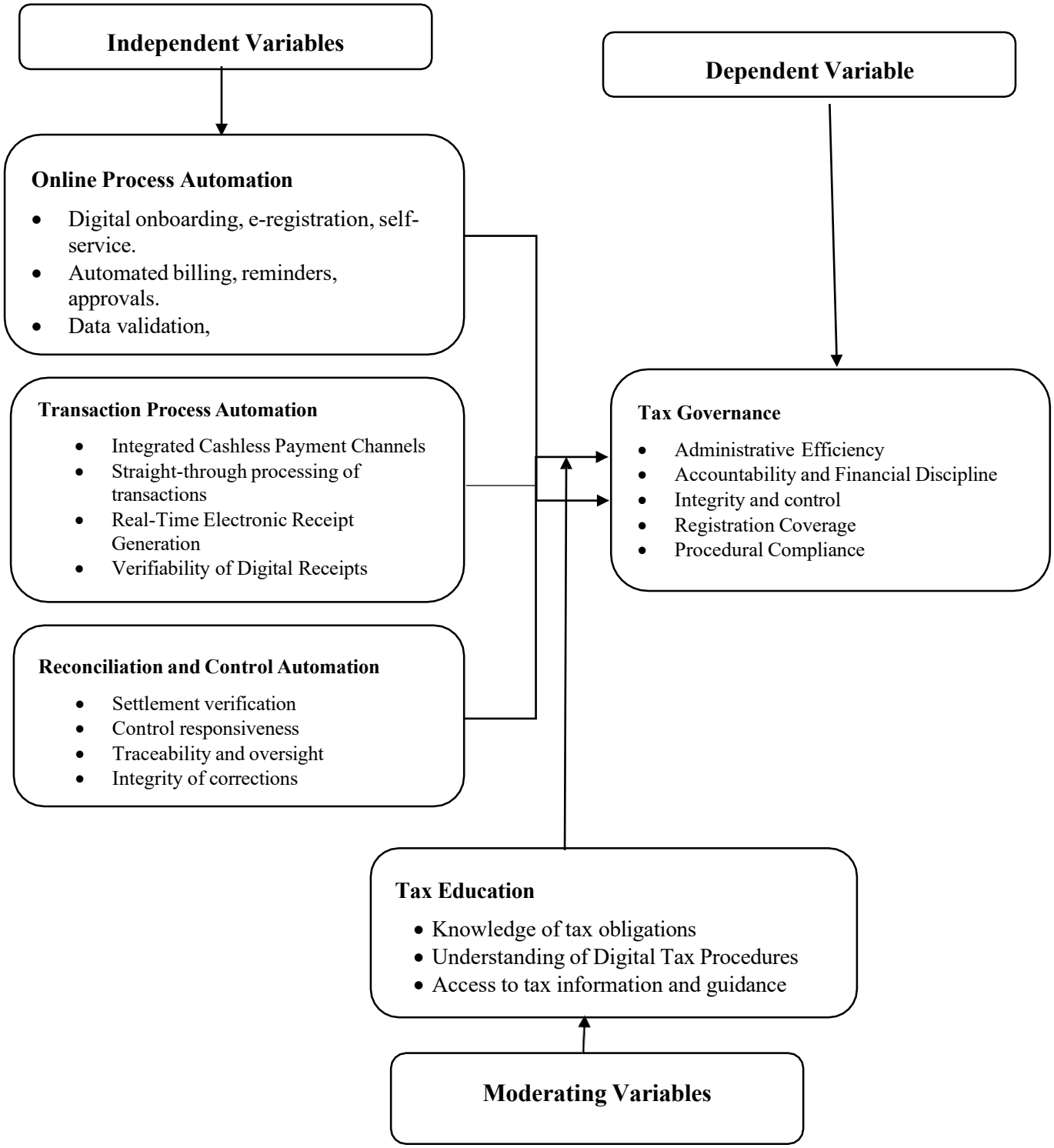
Process automation theory asserts process-based activities can be mapped, simplified, and executed by information systems with clear roles, controls, and complete audit trails (Hesami *et al.,* 2024). The theory represents the position that the standardization and system execution decrease error and discretion and make workflows traceable and easier to monitor (Kroll, 2021). It presupposes that revenue activities can be defined as explicit rules, that systems are more reliable in applying these rules than ad hoc manual processing and embedded controls such as unique identifiers, role segregation, time stamps and automatic matching reduce the risks of leakage and speed up processing.

In line with the objectives of this study, the theory anticipates that online process automation will have a positive impact on efficiency and compliance via standard procedures and straight through processing (Blahušiaková, 2023), it explains why electronic receipting should enhance reconciliation integrity and promote timely payment through instant verification and traceable receipts, it justifies the expectation that an integrated approach to online process automation will result in a multiplied effect on gains in both collection efficiency and tax compliance.

1.13 Conceptual Framework

In the study, the conceptualization of system automation is operationalized into four dimensions, i.e., online process automation, e-receipting, e-payment integration, and real-time support/response as the set of independent variables.

Figure 2.1 Conceptual Framework



CHAPTER TWO

LITERATURE REVIEW

2.1 Introduction

In this chapter a thorough and critical review of the research studies previously conducted on the use of system automation in revenue collection and related topics is done. Theories on adoption of technology and innovations and also theories applicable in revenue collection are brought to the fore to provide a foundation and offer a clear outlook of the subject of this research. Other researchers have conducted previous studies on similar topics and their work is also highlighted under the empirical literature review to ensure there is good foundation of the study and also be able to help in identifying existing gaps.

2.2 : Review of Literature

2.2.1 Online Process Automation and Tax Governance

Hesami *et al*., (2024) reported faster processing and reduced administration burden by tax administrators who adopted electronic filing, electronic payments, electronic invoicing, and routine analytics. Comparative design was utilized in the study in more than fifty administrations utilizing standardized indicators and documented practices. The findings showed measurable improvements in the promptness of filing, payment patterns, and reduction of errors where end to end digital workflows were deployed and data governance supported these. The gap in the research was that the research remained national and descriptive and failed to explain how the county governments with different capacities and revenue mixes should prioritize some modules like online assessment, electronic receipting and payment integration.

Elumilade *et al*., (2022) explored the question of whether some digital tools translate into higher revenue yields, and lower compliance gaps. In cross country panel regressions that were congruent with adoption of electronic filing and electronic payment with tax to GDP ratios and controlling macroeconomic and institutional features, the study concluded that higher digital adoption was linked to higher revenue performance and lower value added tax gaps. But national totals obscure local facts and do not isolate the process automation channels of counties in the collection of permits, market fees, house rent and other dues.

In a government that balanced core platforms with back-office processes re-engineered, the analysis of digital transformation in revenue and customs administrations (Addo, 2022) revealed shorter cycle times and stronger reconciliation. Case examples and evidence of implementation demonstrated that workflow automation, integration with treasury and banking systems, and audit analytics enhance control. However, micro measures, like cost to collect per shilling, reconciliation match rates, and days from assessment to cash, are rarely reported in the sub-national context, which limits the directly transferable nature of such measures.

The shift of the process environment to online mode with increased collections and improved on-time filing and payment are all associated with the move in Nigeria following the implementation of the TaxPro Max platform in 20212025 (Ndukwe and Allison, 2021). Before-and-after designs and user surveys compared remittance and filing patterns across the times. Although the increase in outturns and compliance were statistically significant, the studies did not separate which modules of processes were involved in the improvement or how similar results would unfold in devolved county settings.

In Rwanda, a 2025 evaluation of electronic payment channels posed the question of whether the transfer of taxpayers to electronic rails makes the collection processes better (Putrevu & Mertzanis, 2023). Survey evidence and administrative data comparing digital and manual users showed that there are shorter processing times and an easier time in reconciling it. The end-to-end effect was under-specified in counties since online assessment, electronic receipting, and exception handling were not collectively considered.

According to the filing-season report of the 20212025 individual income tax filing in South Africa, the increase in automated pre-population and on-line workflows resulted in less friction and reduced on-time compliance. These findings were supported by seasonal statistics and service measures, as well as a consideration of accuracy issues necessitating continuous quality assurance (Faybishenko *et al.,* 2022). The evidence, however, is in terms of national personal tax, rather than county own-source streams, which rely on online permitting, local fees, and daily reconciliation with banks and ledgers.

As an example, Nairobi City County fiscal papers 20242025 mention the introduction of online revenue platforms with one-stop-service centres in order to increase own-source revenue and decrease the difference in reconciliation (Golubchikov *et al.,* 2024). Administrative trend analysis

and narrative accounts of NairobiPay and service redesign revealed better collections and control of receipting and recording. Since this was a descriptive analysis, it did not give an identification of causation or stream level testing of what online process features such as automated billing or system approvals were most important.

These stories are supplemented by audit perspectives. In a report on 20232024 notes, the Auditor General of Kenya consolidated reports that note that automation ensures that receipting and recording are faster, but gains in efficiency are watered down where the reconciliations and ledgers lag behind system totals (The Impact of Fintech on Banking and Finance, n.d.). Analysis of statements versus system output and bank and ledger records showed some material variances in certain counties and necessitated increased control and disciplined reconciliation (Wachira, 2022). These audits detect the vulnerability of controls, yet do not seek to estimate the causal influence of some automation modules in a specific county or to trace them to quantifiable changes in the efficiency of the collection and compliance with taxes.The reviewed literature is associated with online process automation and its quicker processing, reduced error rates, enhanced reconciliation, and improved filing and payment behavior. The only thing that is open is the county level evidence quantifying the effects of the specific components counties actually implement, that is, automated assessment and billing with system approvals and reminders, electronic receipting with verifiable identifiers and instant posting to accounts and ledgers and electronic payment integration with same day or next day reconciliation. The present investigation reacts by estimating the impacts of these elements as applied to the Uasin Gishu County on the efficiency of collection and compliance with tax rates across the major sources of revenue using administrative indicators that have been harmonized to county level operations.

2.2.2 Transaction Automation and Tax Governance

Automation of transactions, such as the processing of electronic payments, automated electronic receipting, has received widespread attention as a way of improving the timeliness of settlements, the integrity of transactions and the openness of the tax administration system. At the international level, under the provisions of the 2023 comparative review by the OECD, tax administrations that integrate electronic payment channels with automatic generation of receipts into their operational models experience shorter settlement cycles and less administrative overhead, particularly when payments are posted automatically on the taxpayer accounts and revenue ledgers (Hesami *et al*.,

2024).The review, based on standardized indicators in over fifty jurisdictions, finds that improvements in on-time payment behavior, and fewer payment-related disputes in administrations that removed manual confirmation processes. Nevertheless, the analysis is mostly national in scope and does not analyze the operation of transaction automation in decentralized or county-based revenue systems with various local revenue streams.

Elumilade *et al*., (2022) also confirms the importance of transaction automation in enhancing revenue performance. Elumilade et al., (2022) demonstrated that adoption of electronic payment systems is related to greater realization ratios and reduced compliance gaps especially in environments where minimal handling of cash is possible and where settlement is automated. Although these findings show that payments execution and receipt verification bring macro-level benefits, they are based on aggregated national indicators and do not isolate the operational mechanisms by which payment execution and receipt verification lead to macro-level benefits.

World Bank case studies of digital public finance reforms highlight the importance of embedded payment execution and receipting within integrated platforms to deliver the most significant benefits of governance (Addo, 2022). Revenue and custom Case studies of automated callbacks by banks and mobile money providers and instant electronic acknowledgements have demonstrated that they improve traceability and minimize the possibility of diversion. However, these narratives are mostly descriptive and are centered on central government systems, with minimal focus on county governments whose transactions are predominantly high-volume and low-value transactions including permits, market fees, parking and rents.

Evidence at nation level in Africa demonstrates the same trends. In Nigeria, assessment of TaxPro Max platform in 2021-2025 report that the integration of a bank and mobile payment gateway directly into the revenue system enhanced the timeliness of settlements and provided less traction on the legitimacy of proof of payment (Ndukwe & Allison, 2021). Survey and before and after studies show that the rate of on time payment is higher when electronic receipts are the default method of confirmation. Nonetheless, these studies lack disaggregating the marginal effects of the execution of payments versus the generation of receipts, as well as, the measurement of applicability in devolved government environments.

In Rwanda, a 2025 evaluation of digital payment reforms revealed that the transition of taxpayers to integrated electronic payment channels reduced the time to process and improved daily

reconciliation (Putrevu & Mertzanis, 2023). Government data indicated fewer outstanding items and end-of-day closures under digital acknowledgement were automated. Although these gains were enjoyed, the study was mainly concentrated on payment rails, and thus failed to jointly investigate the broader governance effects.

Kenyan evidence mirrors these findings and points to the existing gaps. The 20242025 reports by Nairobi City County report on improvements of daily visibility of collections and faster posting of collections with the expansion of mobile and bank payment channels linked to the county platform (Golubchikov *et al*., 2024). Anecdotal reports indicate that the use of electronic receipts lowered the level of disagreements and enhanced the confidence of taxpayers. Nonetheless, the analysis is descriptive and does not measure the degree to which the automation of transactions enhances realization ratios, the arrears, or the compliance across certain revenue streams.

Audit views give additional knowledge. Consolidated Auditor General reports, 20232024, show that the counties with regular use of electronic payments and verifiable receipts had fewer discrepancies between system records and bank statements (Wachira, 2022). However, audit reports do not consider the causal effects, and do not differentiate between weaknesses due to payment execution and weaknesses due to payment receipt.

According to the literature, the benefits of transaction automation include better tax governance through acceleration of settlement, enhanced evidence of payment, reduced disputes and improved traceability. Nonetheless, there is little county-level empirical research that quantifies the impact of particular transaction automation features such as the automatic posting of payments, the real-time generation of electronic receipts, and the ability to identify receipts that can be verified in devolved government settings. This paper fills this gap by studying the concept of the Transaction automation in Uasin Gishu County and estimating its impact on the outcomes of tax governance across major own-source revenue streams.

2.2.3 : Reconciliation and Control Automation on Tax Governance

Reconciliation and control automation is the implementation of internal control enforcement, transaction-verification, and the creation of auditable records on a transaction-by-transaction basis throughout the entire revenue administration process. Reconciliation and control functions are now more commonly being seen as central to tax governance as they determine whether assessed and paid revenues are properly recorded, verified and reported. The results of the fiscal transparency

reviews by the European Commission suggest that administrations that implemented automated bank-system reconciliation and extensive audit trails achieved higher levels of transparency and consistency in revenue reporting, especially when reconciliation was performed on a daily basis, and when supported by role-based access controls (Samardžici and Velic, 2024). These reviews however are mainly related to the context of supranational or central government and do not touch on the operational complexities of decentralized revenue administration.

Additional hints are given by the research of Nordic tax administrations, where automation of reconciliation has long been integrated into the system of government financing. Swedish and Danish reviews demonstrate that automated matching of payment records to treasury and ledger accounts have been shown to significantly reduce backlogs in reconciliation and audit questions, enhancing fiscal discipline and administrative responsibility (Westberg and Hjalmarsson, 2023). Even in the case of devolved systems in developing countries, despite these examples, the applicability of the governance value of reconciliation automation is constrained by differences in institutional capacity, transaction profile and enforcement environment.

The governance role of automation of reconciliation and control also makes the case in the research on municipal revenue systems in Southeast Asia by the Asian Development Bank. Indonesia and Philippine case studies reveal that local governments that automated exception processing, approval processing, and audit logs showed improvements in reporting accuracy and internal control, especially in high volume fee-based revenue streams (ADB, 2023). However, these studies are mostly qualitative in nature and they do not quantify the effect of reconciliation automation on efficiency or compliance outcomes at the sub-national level.

In Latin America, municipal revenue reforms in Chile and Colombia have shown some evidence to similar conclusions. The research studies that investigate the implementation of the local revenue system in the banking platforms state that automated reconciliation minimized the discrepancy between the records in the system and the bank statements and increased the reliability of financial reports to the institutions of oversight (Gomez and Restrepo, 2022). These analyses, however, are largely based on accounting performance, and do not explicitly tie reconciliation and control automation to other indicators of tax governance, such as compliance behavior or timeliness of collection.

The evidence of Africans beyond the frequently mentioned cases also contribute to the relevance of automation of control. The results of assessments of municipal revenue management reforms in Morocco and Tunisia show that automated audit trails and system-imposed segregation of duties minimized discretionary adjustments and enabled faster resolution of revenue exceptions (Ben Ali & Trabelsi, 2023). Nevertheless, despite these results, the studies are limited to pilot municipalities, and they do not provide strong empirical estimates of governance effects using a variety of local revenue streams.

In the East African region, research on the subject of municipal revenue administration in Tanzania and Ethiopia has identified the recurring reconciliation problems where digital systems are in place with manual controls (Mashauri and Tesfaye, 2024). These reports observe that despite the partial automation of payment and receipting functions, the weaknesses in reconciliation processes and access controls, persist and undermine transparency and accountability. Nevertheless, the analyses are mostly diagnostic in nature and they are not empirical tests of the effect of reconciliation automation on efficiency or compliance outcomes.

In Kenya, audit and academic sources continuously recognize the weakly developed reconciliation and control as a very important limiting factor of the successful county-level tax governance. Reports by Auditor General on recent financial years indicate recurring variances between total amounts in the revenue system and bank accounts, as well as between general ledger balances and the total amount in the revenue system (Wachira, 2022). Although, according to these reports, the enhancement of automated controls can help in improving the efficiency of revenue collection or compliance by taxpayers. On a similar note, Kenyan academic research recognizes that digital platforms have enhanced payment and receipting but cautions that gains in governance are diluted where payment and receipting functions are manual or inconsistently applied (Kirui & Mose, 2024).

Altogether, reconciliation and control automation are defined in the literature as one of the basic parts of the tax governance, in particular, with the aim to ensure the integrity of revenues, increase transparency, and enhance accountability. However, there is still an obvious empirical gap at the county level in terms of the impact of automated reconciliation, audit trail and internal control mechanisms on revenue collection efficiency and tax compliance in devolved government contexts. This paper fills this gap and evaluates empirically the role of reconciliation and control

automation in Uasin Gishu County and empirically assesses its impact on tax governance outcomes in a decentralized revenue administration setting.

2.2.4 Combined Effects of Online Process Automation, Transaction Automation, and Reconciliation and Control Automation

Contemporary scholarship increasingly suggests that the effectiveness of digital revenue administration depends not on the adoption of individual automation technologies in isolation but on their coordinated implementation within an integrated digital ecosystem. Digital transformation research argues that online process automation, transaction automation, and reconciliation and control automation perform complementary functions that collectively strengthen tax governance by enhancing information quality, operational efficiency, transparency, accountability, and taxpayer compliance (Vial, 2021; Verhoef et al., 2021). While online process automation improves workflow efficiency, transaction automation facilitates secure and timely revenue transactions, and reconciliation and control automation ensures the integrity and accountability of financial records. When implemented as an integrated system, these technologies generate synergistic benefits that exceed the cumulative effects of their individual components.

Evidence from developed economies demonstrates that integrated digital revenue management systems significantly improve governance outcomes compared to fragmented automation initiatives. Studies conducted across European tax administrations indicate that jurisdictions implementing interconnected digital platforms encompassing taxpayer registration, electronic transaction processing, automated reconciliation, and audit controls recorded improvements in revenue accuracy, processing speed, compliance monitoring, and fiscal transparency (Samardžić & Velić, 2024). Similarly, evaluations of Nordic revenue authorities revealed that integrating automated operational processes with transaction processing and reconciliation mechanisms reduced administrative bottlenecks, strengthened internal controls, and enhanced institutional accountability (Westberg & Hjalmarsson, 2023). These findings suggest that the value of digital transformation lies not merely in technological adoption but in the seamless interaction of digital components across the entire revenue administration cycle.

Comparable evidence has emerged from developing economies, particularly within Asia and Latin America, where governments have increasingly adopted integrated digital revenue platforms to strengthen local revenue administration. Case studies from Indonesia and the Philippines reported

improvements in financial reporting accuracy, revenue monitoring, and internal control after local governments integrated automated workflows, electronic transaction processing, and digital audit systems (Asian Development Bank [ADB], 2023). Likewise, municipal revenue reforms in Chile and Colombia demonstrated that linking electronic payment platforms with automated reconciliation systems reduced inconsistencies between banking records and financial statements while improving the reliability of revenue reports submitted to oversight institutions (Gomez & Restrepo, 2022). Nevertheless, most of these studies primarily evaluate operational efficiency and accounting performance, with limited empirical attention given to broader dimensions of tax governance such as transparency, taxpayer compliance, and administrative accountability.

Within Africa, digital revenue reforms similarly demonstrate the importance of integrated automation in strengthening public financial management. Studies from Morocco and Tunisia found that combining automated transaction processing with electronic audit trails and system-based internal controls reduced discretionary interventions, strengthened financial oversight, and accelerated the resolution of revenue discrepancies (Ben Ali & Trabelsi, 2023). However, evidence from East African countries, including Tanzania and Ethiopia, indicates that governance challenges persist where automation initiatives are implemented in a fragmented manner. Mashauri and Tesfaye (2024) observed that although electronic payment and transaction systems had improved revenue collection, weak reconciliation procedures and inadequate control mechanisms continued to undermine transparency and accountability. These findings underscore that partial automation limits the realization of the full governance benefits associated with digital transformation.

The Kenyan experience reflects similar implementation challenges. County governments have progressively introduced online revenue collection systems, electronic payment platforms, and digital financial management systems to improve own-source revenue administration. However, reports by the Office of the Auditor-General continue to identify discrepancies between revenue management systems, banking records, and financial statements, suggesting weaknesses in system integration and automated control mechanisms (Wachira, 2022). Recent empirical studies further indicate that while counties have made considerable progress in digitizing selected revenue functions, fragmented implementation of automation technologies continues to constrain efficiency, transparency, and taxpayer confidence (Kirui & Mose, 2024). These observations suggest that adopting individual automation initiatives without effective integration may produce only incremental improvements in tax governance.

Overall, the reviewed literature demonstrates growing consensus that online process automation, transaction automation, and reconciliation and control automation reinforce one another when implemented as an integrated revenue management system. Nevertheless, existing empirical studies have predominantly examined these automation dimensions independently, with relatively limited attention devoted to their combined influence on tax governance, particularly within devolved governments in developing countries. Furthermore, little empirical evidence exists on how the coordinated implementation of these technologies influences revenue collection efficiency, transparency, accountability, and taxpayer compliance in Kenyan county governments. This study addresses this knowledge gap by examining the combined effects of online process automation, transaction automation, and reconciliation and control automation on tax governance in Uasin Gishu County.

2.2.5 Moderating Effect of Tax Education on the Relationship between Systems Automation on Tax Governance

Tax education has long been recognized as a critical element of effective tax governance, particularly in environments where compliance relies on voluntary participation and accurate self-assessment (Alm & Torgler, (2021). Broadly, tax education refers to the provision of information, guidance, and capacity-building interventions that enhance taxpayers' understanding of tax obligations, procedures, rights, and the use of administrative systems (Gangl, Hofmann, Pollai & Kirchler, 2020). In the global arena, Hesami *et al.,* (2024) has repeatedly stressed that taxpayer education and service-based strategies are core to contemporary tax administration, giving that informed taxpayers are more inclined to voluntarily comply, file properly, and have constructive relations with revenue collection agencies. OECD comparative reviews show that administrations that integrate digital systems with ongoing education initiatives among taxpayers achieve higher filing rates, fewer errors, and lower enforcement costs (OECD, 2023). Nevertheless, these reviews generally consider tax education as a subset of general taxpayer services and do not specifically look at the interaction of tax education with digital automation in order to impact the results of governance.

Investigations of taxpayer service enhancement initiatives reveal that education initiatives, simplified guides, and digital support tools enhance compliance by decreasing information

asymmetries among tax authorities and taxpayers (Mascagni, Santoro, and Mukama, 2022; Joshi, Prichard, and Heady, 2023). The assessments of world banks on the tax modernization programs in Eastern Europe and Central Asia report that taxpayer education programs increase trust in the tax systems and decreases disputes, particularly when introducing new digital platforms (World Bank, 2022). However, these studies are more likely to evaluate education and technology as parallel reforms, than consider whether education conditions the effectiveness of automation in enhancing efficiency and compliance.

Asian empirical studies also shed more light on the governance function of tax education (Nguyen and Le, 2020). A study comparing small and medium enterprise taxation in Malaysia and Thailand indicates a positive relationship between taxpayer training and awareness program and the coverage of registration and the correct filing behaviour. According to survey-based researches, taxpayers who are aware of the digital filing and payment process will tend to use the automated systems more correctly and consistently (Saad & Haniffa, 2021). Although these findings have been made, the majority of the studies estimate the direct effects of tax education on compliance outcomes and do not test whether tax education strengthens or weakens the effect of digital systems on governance indicators.

Latin America Latino evidence of taxpayer education in Mexico and Peru also indicates that taxpayer education leads to better compliance and administrative efficiency, especially in the context of switching to electronic filing and payment systems (Mascagni & Mengistu, 2022). It has been determined that informed taxpayers are able to adapt much more rapidly to online platforms, make fewer mistakes, and receive less administrative support (Bérgolo*, et al.,* 2021). Nevertheless, these studies are mainly based on national tax administrations and do not consider sub-national revenue systems or decentralized governance situations where taxpayer capacity and familiarity with the system is widely distributed.

African studies also highlight the significance of educating tax in determining the outcomes of tax governance. According to research in Ghana and Zambia, the lack of awareness among taxpayers about digital tax reforms reduces their effectiveness because taxpayers cannot read electronic assessments or navigate payment interfaces, or even verify receipts (Okunogbe & Santoro, 2023). On the other hand, better filing and payment behavior is related to the targeted education and sensitization programs, especially in small businesses and operators of the informal sector

(Mascagni, Dom and Santoro, 2021). Although these are the insights that it has, it does not formally test the interactive effects between tax education and system automation.

In the East African region, the research conducted in Uganda and Tanzania identifies persistent gaps in the knowledge of taxpayers as a limitation to the success of digital revenue collectors (Santoro and Waiswa, 2024; Mashauri and Tesfaye, 2024). Assessments of local government revenue reforms demonstrate that although digital platforms enhance transparency and record-keeping, they lack governance benefits in situations where the taxpayers lack an understanding of the procedures or where support mechanisms are weak (Fjeldstad and Heggstad, 2022). These studies not only emphasize the importance of continuous education but also fail to empirically evaluate the role of tax education in mediating the relationship between automation and governance outcomes.

The same trends are echoed in Kenyan literature. Research conducted on the subject of tax compliance and taxpayers behavior has consistently cited knowledge, awareness, and understanding of tax procedures as the determinants of compliance (Kirui and Mose, 2024; Kamau and Kinyua, 2021). County-level analysis reports that the introduction of online revenue platforms has increased access and visibility, but has limited education on taxpayer issues, which leads to errors, sluggish payments, and conflicts (Wachira, 2022). The existing literature in Kenya, however, normally considers tax education as a direct factor affecting compliance or revenue performance, but not its potential role in influencing the effectiveness of automated systems in translating into improved tax governance.

Collectively, the literature confirms tax education as a significant input to tax governance due to its impact on taxpayer behavior, trust, and administrative efficiency (Wachira, 2022). Nevertheless, there is still an obvious empirical gap in terms of the role of tax education as a moderating variable in digital revenue settings. In particular, limited evidence exists on whether the effect of systems automation on revenue collection efficiency and tax compliance is different depending upon the level of taxpayer education and awareness, especially at the county level in devolved government settings. This paper fills this gap by discussing tax education as a moderating variable in the relationship between systems automation and tax governance in Uasin Gishu County and therefore adds context-specific evidence regarding the role of knowledge and awareness in moderating the relationship between systems automation and tax governance in Uasin Gishu County.

2.3 Summary and Research Gaps

According to the literature under review, there is a general consensus on how the process of digitalization can improve the results of the revenue administration process in a multitude of institutional settings. The level of consistency in the empirical research is consistent and notes that digitization of the revenue enhances operational performance in terms of reduction of processing time, manual errors, and improvement of integrity of the revenue records (Hesami *et al*., 2024; Okunogbe and Santoro, 2023). Electronic billing, electronic receipting, and cashless payment facilities constitute digital frameworks that are also associated with a better compliance outcome because they increase the visibility of tax obligations, provide verifiable evidence of payment, and make it easier to detect omissions and inconsistencies (Mascagni *et al.,* 2022; OECD, 2023). In those cases when these factors are supported by disciplined reconciliation and explicit process design, the literature correlates the digital reforms with the more predictable daily closures and increased revenue performance (Paroli, 2023; Kirui and Mose, 2024).

Likewise, the literature warns that the mere availability of technology is not enough to ensure governance benefits. A number of studies stress that the result of process design, system, bank, and ledger records reconciliation effectiveness, and user-supportiveness in digital environments is critically dependent on the coherence of process design, the effectiveness of reconciliation between system, bank, and ledger records, and the extent to which users can be supported to complete tasks correctly in digital environments (Okunogbe and Santoro, 2023; Hesami *et al*., 2024). In any of the cases where there is a delay in reconciliation, parallel manual processes will continue or the control mechanisms will be weak, the benefits of automation will be diluted and may even create new governance risks (Wachira, 2022; Mashauri and Tesfaye, 2024). This underscores the need to consider automation not only as adoption of a system, but the quality and consistency of the use of the automation system throughout the lifecycle of the revenue.

Although there is a general agreement on these principles, there still exist significant research gaps especially to the devolved government in Kenya and to the Uasin Gishu County in particular. Much of the available evidence is country in scale and thus not capturing the operational realities of county administrations which operate within an environment that requires close coordination between field officers, cash offices, banks and county treasury systems (Kirui & Mose, 2024; Wachira, 2022). The absence of county-level analysis leaves some unanswered questions about

how digital platforms perform in day-to-day operations when measured using concrete operational indices such as realization ratios, days to assessments-to-cash, reconciliation match rates, on-time filing and payment-at-the-stream/ ward level.

The second gap is related to the extent of analytical disaggregation of digital reforms. Most studies consider automation as one, bundled intervention, but county revenue platforms consist of various components that control different steps of the revenue process (Hesami *et al*., 2024). Online process automation determines how assessments, approvals, reminders, and case handling are performed within the system; electronic receipting determines whether transactions performed via banks and mobile money transfer systems can be captured through immediate callbacks and posted instantly to taxpayer accounts and the general ledger; and electronic payment integration governs whether transactions executed via banks and mobile money transfer systems can be captured through immediate callbacks and posted instantly to taxpayer accounts and the general ledger (OECD, 2023; Okunogbe and Santoro, 2023). It is hard to say which of these elements are most strongly correlated with or improve efficiency or compliance and they cannot be separated so as to guide investment decisions on where the limited county resources should be directed.

The third gap is associated with measurement. Although some reports indicate an increase in the quality of service delivery or a higher headline collections after digital reforms, they do not clearly define the micro-level indicators and transparent ways of aggregating them (Paroli, 2023; Mascagni et al., 2022). County governments need viable actions that can be derived on the basis of the available administrative information. To be efficient, they are realization ratios, average time between assessment and receipt, match rates of reconciliation across system, bank and ledger records, reversal and correction rates, cost of collection, and forecast accuracy. To comply with it, such relevant indicators as registration coverage, on-time filing, on-time payment, audit adjustments, and arrears dynamics are relevant. The literature seldom indicates how such indicators can be pooled together into indices that can enable managers to track performances at monthly or quarterly levels and determine whether changes in features of platforms are accompanied by changes in governance outcomes (Hesami *et al*., 2024).

Another gap is related to the interface between the county revenue systems and the national digital environment. The introduction of electronic tax invoice management and national initiatives in Kenya impacts business operations across counties, but few studies explore how county platforms

should be connected to these national anchors to facilitate smooth audit trails and reduce inconsistencies across levels of government (Kirui & Mose, 2024; OECD, 2023). Close to development of the control environment is the development of the control environment. Automation could speed up receipting and payment but gains in governance are compromised where receipting and payment is delayed, manual workarounds continue to persist, or access controls and audit logs are weakly enforced (Wachira, 2022; Mashauri and Tesfaye, 2024).

This research is aimed to address these gaps in a specific and practical way. Automation of systems is analyzed at the component level and specifically related to governance outcomes that are pertinent to the county managers. Automation of processes online is measured using indicators that capture the degree of assessments and approvals being done within the system, the use of validation rules and automated reminders and the completeness of audit logs. Automation of transactions including electronic receipting and electronic integration of payment gateways is assessed using indicators like the share of verifiable digital receipts, real-time posting to taxpayer accounts and the general ledger, payment gateway callback success and settlement timeliness. Indicators of banksystem matching, exception handling, access controls, audit trail, and ledger consistency assess the reconsideration and automation of control (Hesami et al., 2024; Okunogbe and Santoro, 2023).

The impacts of these elements of automation are approximated on two tax governance outcome constructs. The efficiency of revenue collection is summarized with the help of the realization ratios, timeliness between assessment and cash, and integrity of the reconciliation, as well as arrears dynamics combined into an efficiency index, whereas tax compliance is summed up using registration coverage, on-time filing, on-time payment, audit adjustments, and arrears dynamics combined into a compliance index (Mascagni *et al*., 2022; Kirui and Mose, 2024). Besides component level analysis, the study develops a composite systems automation index, representing breadth of modules, breadth of use, quality of controls, and service performance and uses it to estimate the combined impact of automation on tax governance outcomes. The contextual variables, like seasonality, alterations in fees and charges, and the severity of enforcement, are included to enable the cautious interpretation of results.

The research provides empirically rigorous, methodologically transparent, and directly applicable evidence that directly applies the findings to county revenue administration. Contribution is

empirical in quantifying the effects of automation of components and composite indices in a devolved government, methodological in showing how component and composite index can be constructed and tracked over time, and practical in determining which of the elements of systems automation are most likely to enhance realization, reduce the time lag between assessment and cash, strengthen reconciliation, and increase compliance in Uasin Gishu County. The current study therefore sought to fill the gaps in literature by examine the effect of systems automation on tax governance in Uasin Gishu County, Kenya. The study further sought to determine the moderating effect of tax education on the relationship between systems automation and tax governance

CHAPTER THREE

RESEARCH METHODOLOGY

3.1 Introduction

This chapter presents the research methodology adopted in the study. It outlines the research philosophy, research design, target population, sampling technique, sample size determination, data collection methods and instruments, pilot study, validity and reliability of the research instruments, data collection procedure, data analysis methods, diagnostic tests, ethical considerations, and the chapter summary. The methodological procedures provided a systematic framework for generating, analyzing, and interpreting data to examine the effects of systems automation on tax governance and the moderating role of tax education in Uasin Gishu County, Kenya.

3.2 Research Design

The research design used in this paper was explanatory cross sectional survey research design. A cross-sectional design will be suitable when the aim is to test relationships among variables as they are at one point in time, without attempting to manipulate the study environment (Creswell and Creswell, 2018; Saunders *et al.,* 2019). The design of this study allowed the analysis of the relationships between systems automation and tax governance outcomes based on the data collected with county revenue officers and taxpayers who are involved in the work of the automated revenue system.

The explanatory orientation of the design is appropriate since the study was aimed at testing the hypothesized relationships between clearly defined variables, including the direct effects of automation of online processes, automation of transactions, and automation of reconciliation and control, as well as the moderating effect of online process automation (tax education) (Bryman, 2016). Explanatory survey designs are typically used in studies of public administration and taxation when the aim is to evaluate the relationship between institutional or technological factors and governance and performance outcomes (Hair *et al*., 2022).

The cross-sectional strategy enabled the research to document current practices of use of the systems and governance results without disrupting the normal county revenue processes. This method was especially suitable in the context of the public sector when it was impossible to use

experimental or longitudinal designs because of administrative, time, or access limitations (Saunders *et al*., 2019). Earlier empirical research on county revenue systems in Kenya has been successful in applying cross-sectional survey designs to study the implementation and impact of the integration of Revenue Management Information Systems (IRMIS) into the system (Kirui & Mose, 2024).

In general, the explanatory cross-sectional survey design was a useful and methodologically appropriate framework to generate empirical evidence on the relationship between systems automation and tax governance at the county level within the context of this proposal.

3.3 Research Site

The study was conducted in Uasin Gishu County, Kenya, one of the country's forty-seven devolved county governments established under the Constitution of Kenya (2010). The county was purposively selected because it has progressively implemented digital revenue administration initiatives, including online assessment, electronic transaction processing, cashless payment systems, and electronic receipting, making it an appropriate setting for examining the relationship between systems automation, tax education, and tax governance.

Moreover, the county provides access to key stakeholders involved in revenue administration, including county revenue and finance personnel, as well as registered taxpayers who regularly interact with the automated revenue management system. These characteristics provide an appropriate context for evaluating how digital systems and taxpayer education influence governance outcomes within a devolved revenue administration framework. The geographical location of Uasin Gishu County and the study area are presented in Appendix V, which illustrates the county's position within Kenya and provides the spatial context of the research. The map enhances the geographical description of the study site and facilitates a clearer understanding of the area in which the study was undertaken.

3.4 Target Population

The target population consisted of 415 actors who interacted with county revenue processes and the integrated revenue management system. Based on this, the study population was reduced to those who have used the automated systems in the last 12 months, as the respondents will be able to validly report on the use of the automated systems, their efficiency, and their compliance. To obtain representativeness, a stratified random sample was selected across two strata county staff and taxpayers (sub-stratified by stream/sector); the results were generalized to the study population under the standard sampling assumptions.

Table 3.1 Population Distribution

Stratum	Description	Count
County revenue officers & cash office staff	Assessment, receipting, field collection	30
Revenue supervisors & system admins	Unit heads, IRMIS/admin users	10
Finance/accounts (reconciliation) staff	Posting, bank–system reconciliations	15
Taxpayers: Wholesalers	Active licences, used e-payment/e-receipting in last 12 months	120
Taxpayers: Distributors	Active licences, used e-payment/e-receipting in last 12 months	40
Taxpayers: Traders/SMEs (permits/fees)	Market/stall/permit holders using digital channels	200
Total Target Population		**415**

Source Uasin Gishu County Reports 2025

3.5 Study Sample

This section describes how participants were selected and how the final sample size and allocation was determined.

3.5.1 Sampling Procedure

Stratified random sampling with proportional allocation was used to conduct the study. These two broad strata county staff and taxpayers were further disaggregated into six functional strata to reflect where automation was experienced. Sampling frames was selected based on the county HR roster, and the current licensing/permit registers. In each stratum, the eligibility criteria were that participants used the automated system within the past 12 months; simple random selection was used based on the random-number generator to eliminate selection bias. No responses were substituted by pre-selected reserves even within the same stratum.

3.5.2 Study Sample Size

Using Cochran's formula at 95% confidence and 5% margin of error with

p=0.5:

$$Initial\ n0 = \frac{Z^2 p(1-p)}{e^2} = 1.962 \times \frac{0.25}{0.052} = 384.16$$

$n_0 = \frac{\{Z^2 p(1-p)\}}{\{e^2\}}$

$$= \frac{\{1.96^2 * 0.25\}}{\{0.05^2\}} = 384.16.$$

Applying finite population correction for N=415

$$n = n01 + n0 - 1N = 384.16$$

$$1 + 383.16\,415 = 199.7 \Rightarrow n = 200$$

$$n = \{n_0\}/\{1 + \{n_0 - 1\}/\{N\}\}$$

$$\{384.16\}/\{1 + \{383.16\}/\{415\}\} = 199.7\, n = 200.$$

Table 3. 2 Proportional allocation by stratum (Total sample = 200):

Stratum	**Population (N_i)**	**Sample n_i**
County revenue officers & cash office staff	30	15
Revenue supervisors & system admins	10	5
Finance/accounts (reconciliation) staff	15	7
Taxpayers: Wholesalers	120	58
Taxpayers: Distributors	40	19
Taxpayers: Traders/SMEs (permits/fees)	200	96
Total	**415**	**200**

Each stratum was allocated in proportion to the size of the stratum (rounded; totals reconciled to 200). Checks of reliability were performed based on Cronbachs α = 0.70; significance = 0.05.

3.6: Data Collection

3.6.1 Data Collection Instruments

The data were collected through a short, structured questionnaire which was supposed to directly correspond with the variables of the study online process automation, transaction automation, reconciliation and control automation, and tax governance with the addition of other items to capture tax education as a moderating variable. The questionnaire was based on closed-ended questions measured using a five-point Likert scale between strongly disagree and strongly agree

(a) to capture perceptions, practices, and experiences in a standardized way (Likert, 1932; Saunders et al., 2019).

The items of the questionnaires were stated in simple and clear language to improve the understanding of both the county officials and the taxpayers. The instrument was translated into Swahili, through a forward-back translation process to ensure that the version translated into Swahili and the one translated to English had semantic equivalence, in accordance with recommended practices of using multilingual instrumentation in survey research (Brislin, 1970; Creswell and Creswell, 2018).

The instrument was filled in through electronic data collection tools like Open Data Kit (ODK) or Google Forms to enhance efficiency and accuracy and real-time monitoring of the responses. In areas where there would be limited access to digital media, a paper-based approach to the questionnaire was adopted as a backup measure to ensure that all respondents would be included. To increase the quality of the data, the electronic tool has added skip logic, mandatory fields, and soft validation checks to reduce the number of missing data and out-of-range values (Dillman *et al.*, 2014). The completed paper questionnaires were then inputted in the electronic system utilizing the same validation rules so that consistency could be maintained.

3.6.2 Pilot Testing of Research Instruments

The pilot study was carried out in the Elgeyo Marakwet County which was chosen since it has the main IRMIS and has structures of administration and collection of revenue that are comparable to those of Uasin Gishu County. The pilot sample was 10% of the overall population of the proposed study and in line with methodological provisions of pre-testing of instruments. The respondents comprised of the county revenue officers and tax payers who had experienced the automated revenue system during the last twelve months. Pilot study data were not part of the final analysis and were only used to evaluate clarity, reliability and validity of research instruments and to test major assumptions of statistics.

The pilot studied the intelligibility of items in the questionnaire, logical sequence, time required to complete the items and item performance. Pilot data were analyzed to determine internal consistency (Cronbachs 0) and item total correlations and respondent feedback on any challenging or ambiguous questions. Adjustments, which were necessary, were made before the complete

implementation of the survey. To avoid contamination of the results, pilot participants were not included in the main study sample.

3.6.3 Instrument Reliability

Reliability refers to the extent to which a research instrument consistently measures the constructs it is intended to assess. In this study, the reliability of the structured questionnaire was evaluated by assessing the internal consistency of the items measuring each study construct, namely online process automation, transaction automation, reconciliation and control automation, tax education, and tax governance. Cronbach's alpha (α) coefficient was computed for each multi-item construct, with a threshold of $\alpha \geq 0.70$ considered acceptable for demonstrating satisfactory internal consistency (Hair et al., 2022). Where appropriate, split-half reliability was further assessed using the Spearman–Brown coefficient to provide additional evidence of the questionnaire's reliability. Following the pilot study, reliability analysis was repeated after data cleaning, and questionnaire items with weak item-total correlations were reviewed, revised, or removed while ensuring that the content validity of each construct was maintained.

3.6.4 Instrument Validity

Validity refers to the extent to which a research instrument accurately measures the constructs it is intended to measure. In this study, the validity of the **structured questionnaire** was assessed to ensure that the questionnaire items adequately measured the five study constructs, namely online process automation, transaction automation, reconciliation and control automation, tax education, and tax governance. Content validity was established through expert review by specialists in public finance, management information systems, and research methodology, who evaluated the relevance, clarity, and representativeness of the questionnaire items. Their assessments were summarized using the Item-Level Content Validity Index (I-CVI) and the Scale-Level Content Validity Index (S-CVI).

Construct validity of the structured questionnaire was evaluated using the Kaiser-Meyer-Olkin (KMO) measure of sampling adequacy and Bartlett's Test of Sphericity, followed by Exploratory Factor Analysis (EFA) or Confirmatory Factor Analysis (CFA), as appropriate. Acceptable model fit was assessed using Comparative Fit Index (CFI) and Tucker-Lewis Index (TLI) values of at least 0.90, together with Root Mean Square Error of Approximation (RMSEA) and Standardized Root Mean Square Residual (SRMR) values not exceeding 0.08. Convergent validity was

established where the Average Variance Extracted (AVE) was at least 0.50, while discriminant validity was confirmed using the Heterotrait-Monotrait (HTMT) ratio of correlations below 0.85 (Hair et al., 2022).

Criterion validity was further assessed by comparing questionnaire scores across respondent groups expected to differ in their experience with county revenue systems, thereby determining whether the instrument effectively discriminated between known groups. In addition, procedural remedies, including respondent anonymity, neutral wording of questionnaire items, and careful questionnaire design, were employed to minimize common method bias. Statistical assessment of common method bias was undertaken using Harman's single-factor test and full-collinearity Variance Inflation Factors (VIF), with VIF values below 3.3 indicating that common method bias was unlikely to threaten the validity of the study findings (Kock, 2021).

3.6.5 Data Collection Procedures

The stratified random sample was drawn based on the HR roster and licensing registers and a letter was sent with informed consent. The questionnaire was filled in with the help of secure links and onsite assisted sessions; quality checks, back-checks and supervisor call-backs on the questionnaire ensured completeness and authenticity. Two non-successful contacts led to replacement of non-respondents by preselected reserves within same stratum. The de-identification of all records, their secure storage (encrypted e-files; locked cabinets with paper), and export to the analysis software were achieved on the field close-out.

3.7 Data Analysis

After data collection, responses were filtered in terms of completeness, consistency and plausibility. The validated Likert-scale items were averaged as construct scores to clean the responses and then code and aggregate the responses into construct scores. Automated processes in systems were operationalized in three independent constructs: online process automation (OPA), transaction automation (TA) and reconciliation and control automation (RCA). The dependent variable tax governance were operationalized as a composite index that measures the efficiency of revenue collection and tax compliance. Tax education was perceived as a moderating factor depending on how the respondents had been exposed and understood the tax procedures and the use of digital systems.

3.7.1 : Qualitative Data Analysis

Thematic analysis was used to analyze qualitative data presented in the form of responses to open-ended questions and follow-up explanations. The analysis was conducted by systematically reviewing responses in identifying recurrent patterns, meanings, and explanations in relation to system automation, tax education and tax governance. The responses were to be initially read out repeatedly, in order to achieve familiarization with the data, after which key phrases and statements would be coded, based on their significance to the study objectives. These codes were then clustered into general themes about the experiences of respondents with the automated tax systems, their understanding of the tax processes, the challenges they faced in using the system and their perception of transparency, accountability and compliance.

The identified themes served to support and develop the quantitative data by offering some contextual explanations of the observed statistical relationships. The qualitative findings were applied to give explanations on the how and why of the system automation and tax education on the result of tax governance in action, particularly in relation to user comprehension, system usability and operational issues. In some cases, illustrative and verbatim excerpts were adopted in order to support interpretation, whilst ensuring confidentiality of respondents. That is why the qualitative analysis was rather supportive as it enhanced the understanding of the quantitative results and supported the overall interpretation of the study findings.

3.7.2 : Quantitative Data Analysis

Descriptive statistics were created to summarize the distribution of all variables and then reliability and validity analyses were performed on the multi-item constructs. The analysis was followed by multiple linear regression with Ordinary Least Squares (OLS) estimation to test the relations hypothesized. Two tailed tests were used to determine statistical significance at the 5 per cent level (95 per cent confidence interval) and model fit was evaluated using the coefficient of determination (R 2) and the adjusted R^2.

Model 1: Direct Effects Model

The initial model approximated the direct effects of automation of the systems on the tax governance without the moderating variable. This model investigates whether the change in

outcome of tax governance can be linked to the change in variation in the three dimensions of automation.

$$TG_i = \beta_0 + \beta_1 OPA_i + \beta_2 TA_i + \beta_3 RCA_i + \varepsilon_i$$

Where:

- TG_i= Tax governance index for respondent i
- OPA_i= Online process automation
- TA_i= Transaction automation
- RCA_i= Reconciliation and control automation
- β_0= Intercept
- $\beta_1, \beta_2, \beta_3$= Regression coefficients
- ε_i= Error term

This model gives the baseline estimates of individual contribution of each automation component to tax governance.

Model 2: Moderation Model (Tax Education)

The second model added tax education as a moderating variable to determine whether the effect of systems automation on tax governance varies with the level of taxpayer education. Moderation was be tested by incorporating interaction terms between tax education and each of the dimensions of automation.

$$TG_i = \beta_0 + \beta_1 OPA_i + \beta_2 TA_i + \beta_3 RCA_i + \beta_4 TE_i + \beta_5 (OPA_i \times TE_i) + \beta_6 (TA_i \times TE_i) + \beta_7 (RCA_i \times TE_i) + \varepsilon_i$$

Where:

- TE_i= Tax education
- $OPA_i \times TE_i, TA_i \times TE_i, RCA_i \times TE_i$= Interaction terms

Before the construction of the interaction terms, the mean-centered variables were used to eliminate possible multicollinearity and provide interpretable coefficients.

3.7.3 : Diagnostic Tests and Reporting

Model assumptions was evaluated using conventional diagnostic testing. The residual plot was used to examine the linearity and homoscedasticity, the test of Multicollinearity was conducted using Variance Inflation Factors (VIF) and the normality of the residual was assessed through viewing the histograms and normal probability plots. In the cases where heteroskedasticity was identified, strong standard errors have been used to make valid statistical inferences.

The results of regression were reported as both unstandardized and standardized coefficients along with 95 per cent confidence intervals. The meaning and orientation of coefficients was employed to determine whether automation of systems had a significant impact on tax governance and whether tax education reinforced or weakened such connections.

3.8 Legal and Ethical Considerations

The researcher sought and received ethical clearance by the University Ethics Review Committee and secure statutory authorization by National Commission on Science, Technology and Innovation (NACOSTI), and administrative permission by Uasin Gishu County Government. The study was entirely voluntary and through written informed consent. A clear and understandable participant information sheet was given to each potential participant to explain the purpose of the study, the nature of participation, the expected duration, procedures involved, potential risks and benefits, and their right to decline participation or withdraw at any stage without incurring any penalty or being deprived of any benefits. The consent was informed by signing the consent forms (or equivalent online responses in the form of digital consent) before administering the questionnaire.

Confidentiality of the participants received great importance during the course of the research. The main dataset did not capture any personally identifiable information (names, identification numbers, or contact details). Rather, the respondents were given distinct identification codes and any contact or administration records was maintained independent of the survey responses. Any electronic data was stored on encrypted and password-protected devices with any hard-copy materials stored in locked cabinets only accessible to the researcher. It was only used on academic grounds and data was stored in accordance with university data retention policies and then destroyed in a secure manner.

To further ensure confidentiality and reduce the risk, the research gathered only the information, which was strictly necessary to analyze it, and the responses were reported in an aggregate form to avoid identification of individual participants and institutions. Data collection included enumerators who were trained on ethical behaviour, confidentiality, neutrality and data protection requirements. Academic honesty was maintained by citing and referencing all sources used and by avoiding plagiarism, fabricating or falsifying data. Lastly, the findings of the study were disseminated to the relevant stakeholders including the County Treasury/Revenue Department and the University in a way that respects the privacy of the respondents but also ensures that the results of the study can be used in providing evidence-based policy and practice.

CHAPTER FOUR

DATA ANALYSIS RESULTS AND DISCUSSIONS

4.1 : Introduction

This chapter gives the results and analysis of the study about the effect of systems automation on tax governance in Uasin Gishu County, Kenya with a special focus on the moderating factor of tax education. The analysis is designed to meet the objectives and research questions of the study, and combines both descriptive and inferential statistical methods to allow the study to comprehensively interpret the results.

The descriptive analysis summarizes the demographic profile of respondents and outlines the central tendencies and dispersion measures of the most important study variables, i.e., online process automation, transaction automation, reconciliation and control automation, tax education, and tax governance. Inferential analysis utilizes the correlation and multiple linear regression methods to analyze the relationships between the independent variables, the moderating variable and the dependent variable. In particular, the analysis not only evaluates the direct effects of online process automation, transaction automation, and reconciliation and control automation on tax governance, but also evaluates whether tax education has a significant moderating effect on these relationships. Ordinary Least Squares are used to estimate the regression models and appropriate diagnostic tests are used to ensure robustness of the results.

4.2 : Response Rate

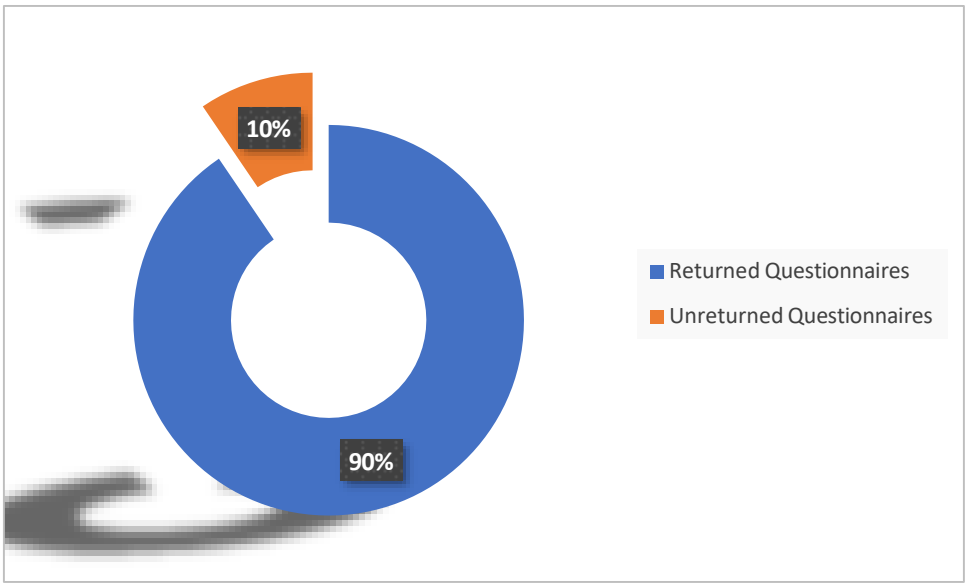


Figure 4:1 Response Rate

The research involved a total population of 200 individuals who were sampled in the research based on the following criteria: County revenue officers and registered taxpayers in Uasin Gishu County. The number of returned questionnaires out of the number of questionnaires distributed is 181 compared to 20 which were not returned hence the response rate is 90 percent. In this figure 4.1, the graphical representation of the response rate is provided. This degree of involvement was deemed to be very satisfactory when it comes to statistical analysis and interpretation. High response rate will decrease the chances of non-response bias and increases the representativeness of the sample in representing the characteristics of the target population.

Weisberg, Krosnick and Bowen (2006) recommend a minimum response rate of 70 percent in research based on surveys to improve reliability and validity of the research findings. Likewise, Mugenda and Mugenda (2008) categorize response rate of 50 percent as sufficient to analyze and report, 60 percent as good and 70 percent and above as excellent. According to these standards, the 90 percent response rate obtained in this study is deemed excellent thus giving a solid basis on which valid and generalizable conclusions can be drawn on the relationship between systems automation, tax education and tax governance in the Uasin Gishu County.

4.3 : Validity and Reliability Tests

4.3.1 : Reliability Tests

To measure the reliability of the research instrument, Cronbachs Alpha was used as a statistical measure of the internal consistency used to determine the degree of reliability of the research instrument. This method is especially suitable in determining the reliability of questionnaires using the Likert-scale. The SPSS version 28 was used for the analysis and the Alpha values of Cronbach were obtained to each of the constructs in the study. The value of the coefficient lies between 0 and 1, where a value of 0.7 or above is usually acceptable as research value indicating that the scale is reliable. It was used to make sure that the items used to measure the key variables (online process automation, transaction automation, reconciliation and control automation, and tax education) were uniform and reliable in their ability to measure the intended constructs.

Scale	Cronbach's Alpha	Number of items
Online Process Automation	0.771	5
Transaction Automation	0.801	5
Reconciliation and Control Automation	0.798	5
Tax Education	0.814	5

Table 4.1: *Reliability Coefficients*

Source: Researcher, (2026)

The internal consistency and reliability of the items in the questionnaire that measured the key constructs of the study were assessed using Cronbach's Alpha. Cooper and Schindler (2008) suggest that Cronbachs Alpha values of 0.7 or above are acceptable in social science research, and show good inter-item correlation and scale reliability. All constructs, as indicated in Table 4.1, produced Cronbachs Alpha coefficients that were above this value, and therefore it is clear that the instrument had high internal reliability. These findings also suggest that the items used to measure the variables of interest were also consistent and reliable throughout the study sample, which forms a solid foundation on the subsequent statistical analysis.

The highest reliability was recorded by Tax Education Construct (= 0.814), followed by a higher reliability recorded by the Tax Education Construct (= 0.798). All these coefficients exceed the recommended cut-off point of 0.7, which means that the measurement scales had been both stable and precise. The high internal consistency obtained in all the variables indicates that the questionnaire items were consistent and represented the underlying dimensions of each construct. The research instrument was therefore considered to be reliable and suitable in the future to undergo descriptive and inferential analysis to ensure reliability and validity of the results.

4.3.2 Validity Tests

Validity is the degree to which a research tool is precise in gauging the desired constructs of a study. Content validity was determined in this study to ensure that the questionnaire items were sufficient to measure the constructs of systems automation (online process automation, transaction automation, and reconciliation and control automation), tax education, and tax governance. The validation process implied the expert evaluation and the quantitative analysis via the Content Validity Index (CVI) that determines the extent to which the items of the instruments are relevant and representative of the study variables (Waltz, Strickland, and Lenz, 2005; Oso, 2013).

4.3.2.1 Content Validity Assessment

To determine the content validity, a panel of three experts with expertise in the areas of public finance management, taxation, and research methodology were used to review the research instrument. The experts rated each item of the questionnaire separately and against the objectives and conceptual framework of the study.

A four-point relevance scale, as recommended by Polit and Beck (2006), was used:

- 1 – Not relevant
- 2 – Somewhat relevant
- 3 – Quite relevant
- 4 – Highly relevant

Items rated as 3 (quite relevant) or 4 (highly relevant) were taken as acceptable and those whose rating was less than that were revised or eliminated to enhance clarity, relevance, and

correspondence with the study constructs. A Content Validity Index (CVI) was then calculated to measure the degree of consensus amongst experts on the relevance of the items.

Calculation of Content Validity Index (CVI)

The CVI was computed at both the item and scale levels:

- **Item-Level Content Validity Index (I-CVI):** This represents the proportion of experts who rated an item as either 3 or 4.

$$I\text{-}CVI = \frac{\text{Number of experts rating item as 3 or 4}}{\text{Total number of experts}}$$

- **Scale-Level Content Validity Index (S-CVI):** This was determined using two approaches:
    - **S-CVI/Ave:** The average of all I-CVI values across the instrument
    - **S-CVI/UA:** The proportion of items that achieved universal agreement among all experts (I-CVI = 1.0)

4.3.2.2 Decision Criteria

Following the suggestions by Polit and Beck (2006), the following criteria were used:

- Only those items whose I-CVI rating was 0.78 and above were valid.
- Articles that were below this mark were either updated or deleted.
- At the scale level, an S- CVI / Ave of 0.70 and above was deemed to be acceptable.
- A value greater than 0.80 was taken as a strong content validity.

4.3.2.3 Findings

The outcomes of the content validation process revealed that most of the questionnaire items had reached the necessary levels of validity. The instrument recorded an overall S-CVI/Ave of 0.93, which shows a high degree of agreement amongst the experts in regards to the relevance and adequacy of the items in determining the study constructs. Things that had initially scored below the acceptable level were changed according to the expert feedback to make it clear, avoid ambiguity and be consistent with the conceptual framework.

These results affirm that the ultimate research tool had high levels of content validity and was suitable in measuring systems automation, tax education, and tax governance in the setting of Uasin Gishu County.

4.4: Demographic Analysis

In this part, the demographic characteristics of the respondents who were used in the study on the relationship between systems automation, tax education, and tax governance on Uasin Gishu County, Kenya. Demographic variables are examined to provide the required contextual basis in the explanation of the empirical findings as variations in the demographic variables can influence perceptions, implementation experiences and outcome in governance.

The demographic variables of interest included encompassed gender, age, level of education, work position within the revenue collection structure in Uasin Gishu County. These attributes were studied to determine the diversity, representativeness, and institutional distribution of the sample. The knowledge of these attributes helps to make the study more credible since it will show that the respondents have the relevant operational exposure to automated revenue systems and governance processes. The results of the demographic analysis are contained in the following subsections.

4.4.1 : Gender of the Respondents

The research aimed at determining the gender of the respondents. The results from the analysis are illustrated in the figure below as shown.

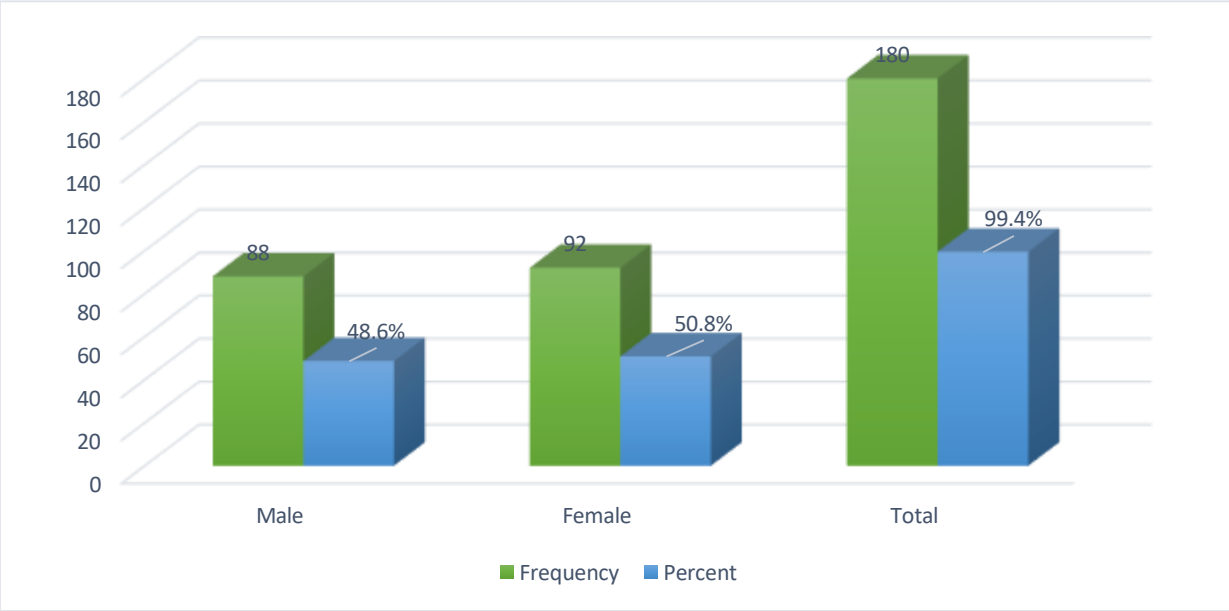


Figure 4.2 **Gender of the Respondents**

The aim of the study was to establish the gender distribution of the respondents in Uasin Gishu County. As illustrated in Figure 4.2, out of the 180 respondents, 88 (48.6%) were male while 92 (50.8%) were female. This shows that there is almost equal gender representation with a slight majority of female respondents.

The even gender distribution increases the reliability and the inclusion of the study results. Because the numbers of both male and female respondents were nearly equal, the perceptions of the systems automation, tax education and tax governance reflect the diversity of the experience of the revenue administration and the taxpayer population. This minimizes the chances of gender bias affecting the study findings.

4.4.2 : Age of the Respondents

The research also aimed at establishing the age group of the respondents engaged in revenue administration and the use of tax system in Uasin Gishu County. According to Figure 4.4, most of the respondents were within the age bracket of 36-45 years with 56 respondents (30.9%), followed

by the other respondents at 43 respondents (25.25) each. The respondents aged 26 to 35 years and 56 years and above had 38 and 15 respondents respectively.

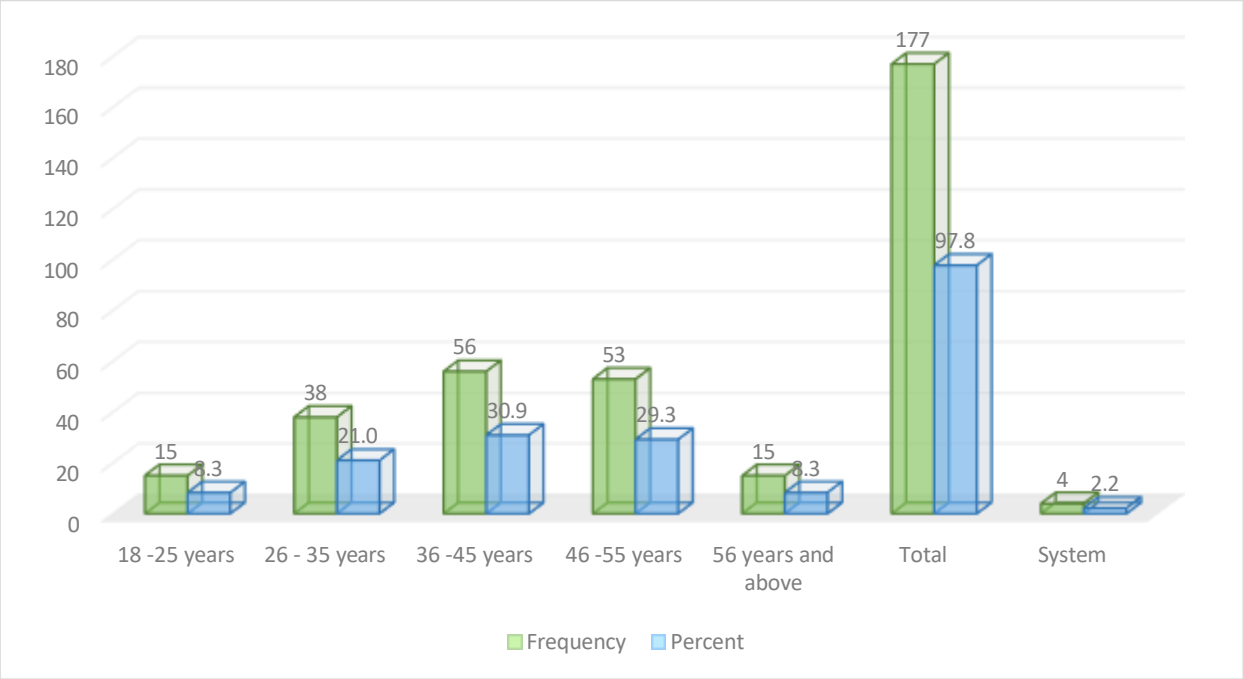


Figure 4.3: Age of the Respondents

The results show that the highest percentage of respondents belong to economic active and professionally experienced age ranges (36-55 years). This is relevant to the study since people in this age bracket are more likely to be occupied in an operational, supervisory, and decision making roles in revenue administration or are actively engaged in business operations that are subject to digital tax systems.

In the context of digital transformation, the age factor can affect the flexibility to the automated mechanisms like IRMIS. The fact that the majority of respondents in the middle career groups are those who have practical administrative experience and long exposure to digital revenue systems, suggests that the attitudes towards automation of systems and tax governance are informed by the practical experience of administration and years of exposure to digital revenue systems. In the meantime, the very fact that digitally native users (1835 years old) are also represented indicates the exposure of younger respondents to the digitally native users, who may be more flexible to the automation process.

This age bracket therefore makes the research results valid since it encompasses the views not only of highly experienced administrative personnel but also, of relatively younger and more technologically adaptable subjects and participants. This balanced representation enhances the validity of the findings on the effects of the systems automation and the tax education on the results of the tax governance in the Uasin Gishu County.

4.4.3 : Respondents' Level of Education

The research also looked into the maximum level of education that the respondents had achieved. Most of the respondents, as it is reflected in figure 4.5, had a high level of academic qualification. Out of the valid responses (n = 174), 74 respondents (42.5) had managed to acquire postgraduate qualifications and 67 respondents (38.5) had received undergraduate degrees. The number of diploma holders was 17 (9.8%), secondary school graduates were 15 (8.6%), and only 1 (0.6%) had primary level education.

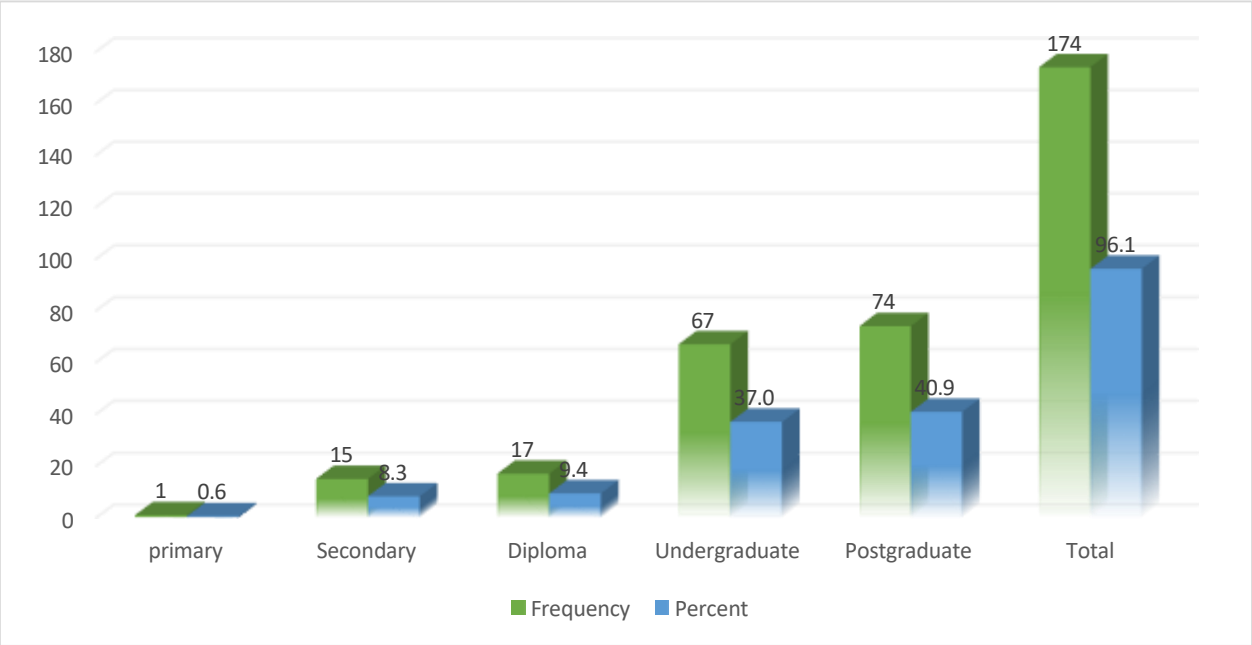


Figure 4.4: Respondents Level of Education

The results show that a significant percentage of the respondents (81 percent) have completed at least an undergraduate degree. This would mean that the study participants were academically up to speed to understand and evaluate systems automation processes, tax education programs, and mechanisms governing systems within the county revenue framework.

The level of education is of particular importance when conducting research on the topics of automation and governance since higher educational attainment is often viewed as a positive factor in terms of analytical skills, the ability to comprehend policies, and flexibility to digital processes. Higher educated respondents who have been educated in tertiary education have more chances of knowing automated workflows, compliance requirements, reconciliation procedures and governance controls that exist in a modern tax administration system.

The large number of undergraduate and postgraduate respondents thus boosts the validity of the results. It means that the answers about the automation of the systems, education about taxes, and tax governance, were based on the answers of the persons who could critically examine the administrative procedure, tax education, and tax governance. In turn, the education level of the respondents reinforces the reliability and validity of empirical conclusions of the study.

4.4.4 : Role in the County Government

The paper also investigated the role or the type of respondents in the county revenue ecosystem. A total of 178 valid responses were analysed, as shown in table 4.2, with 3 responses missing.

Table 4.2: Role in the County Government

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Revenue Officer	6	3.3	3.4	3.4
	Cash Office Staff	8	4.4	4.5	7.9
	Finance Reconciliation Office	17	9.4	9.6	17.4
	Systems Administrator	14	7.7	7.9	25.3
	Taxpayer - Trader-SME	56	30.9	31.5	56.7
	Taxpayer - Wholesaler	41	22.7	23.0	79.8
	Taxpayer - Distributor	36	19.9	20.2	100.0
	Total	178	98.3	100.0	
Missing	System	3	1.7		

Total	181	100.0		

Among the respondents, 56 (31.5%) were traders/SMEs, 41 (23.0%) were wholesalers, and 36 (20.2%) were distributors. The total number of respondents by the taxpayers was 133 respondents (74.7) of the valid sample. On the administrative front, 17 (9.6) respondents were finance and reconciliation officers, 14 (7.9) were systems administrators, 8 (4.5) were cash office staff, 6 (3.4) respondents were revenue officers. The revenue administration staff was a sample of 25.3 percent which comprised 45 respondents (25.3).

The distribution shows that most of the respondents were taxpayers and the central role of system users in assessing the success of systems automation and tax education programs. Simultaneously, the administration personnel inclusion offers operational knowledge of internal operations like assessment, receipting, system administration, and reconciliation controls.

This internal and external stakeholders are especially applicable in a study that investigates tax governance. The results of governance are determined by not only the administrative controls and automation mechanisms but also the interaction between taxpayers and digital systems and the presence of compliance procedures. The representation by both groups thus affords an all-encompassing understanding of the impacts of systems automation and tax training on the governance performance under the county revenue structure.

4.4.5 : Years of Experience with County Revenue Processes

The research also looked at the years the respondents had been participating in the processes of county revenues. In Figure 4.5, 162 valid responses have been analysed.

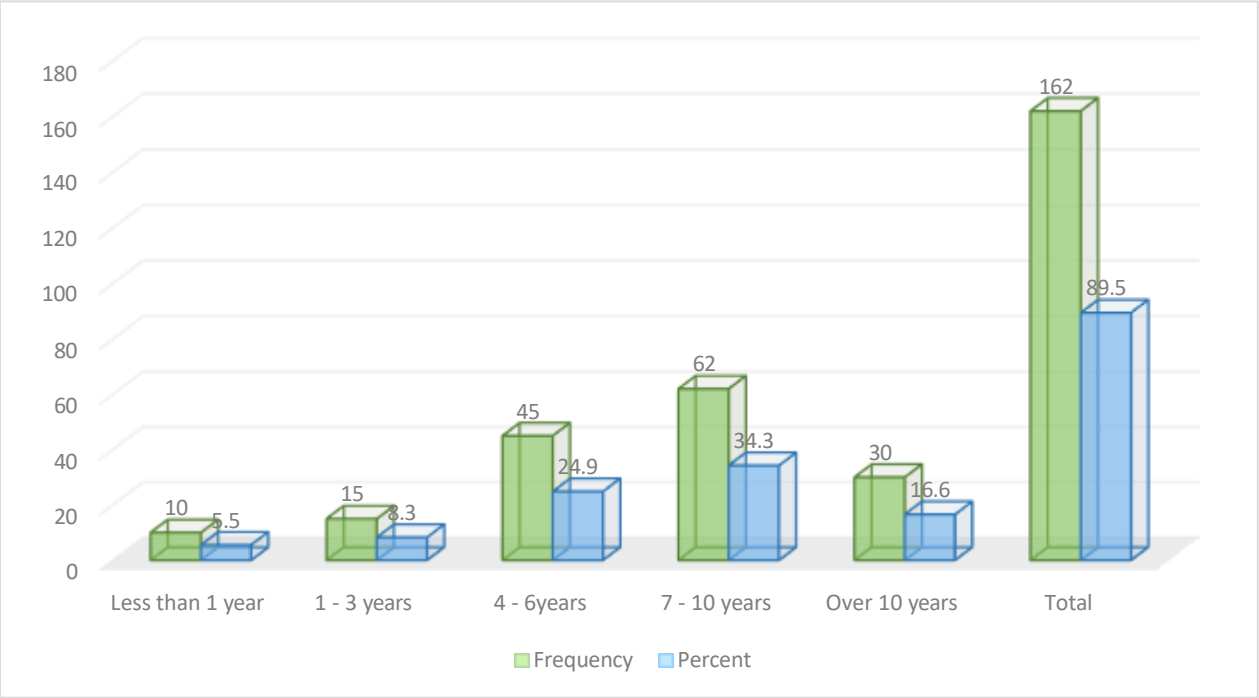


Figure 4:5 Years of Experience with County Revenue Processes

The highest number (62, 34.3) of respondents reported between 710 years of experience, which is the most representative category. This was preceded by 45 respondents (24.7) who had 4-6 years experience. Also, 30 respondents (16.6%) had a minimum of 10 years of experience, and 15 respondents (8.3) had between 1-3 years of experience. The least number was 10 respondents (5.5) who had a less than a year experience.

The distribution shows that most of the respondents (137 respondents, 75.6) had over four years experience in county revenue processes. This implies that the majority of the participants had extensive experience of administrative processes, digital automation systems and governance controls in the revenue framework.

4.4.6 : Workstation/Revenue Stream

The research also considered the workstation or revenue stream where the respondents were engaged. A total of 180 valid responses were analysed as presented in Table 4.3 with one response being recorded as missing.

Table 4.3: Workstation/Revenue Stream

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Business Permits	28	15.5	15.6	15.6
	Markets/Stalls	58	32.0	32.2	47.8
	Parking	41	22.7	22.8	70.6
	House Rent	7	3.9	3.9	74.4
	Cess-Produce	46	25.4	25.6	100.0
	Total	180	99.4	100.0	
Missing	System	1	.6		
Total		181	100.0		

The highest percentage of the respondents 58 (32.2%), were derived out of the Markets/Stalls revenue stream. This was then followed by 46 respondents (25.6%) of Cess-Produce and 41 respondents (22.8%) of Parking revenue. Business Permits had the greatest respondents with 28 respondents (15.6%); the House Rent had the least respondents with 7 respondents (3.9%).

The distribution shows that a good proportion of the respondents were involved in revenue streams where there were frequent transactions and direct interactions with the taxpayers, especially for Markets/Stalls, Cess-Produce and Parking which together accounted 145 respondents (80.6) of the valid sample. These streams are usually operationally intensive and they are often highly dependent on automated receipting, transaction recording and reconciliation procedures. The fact that automation mechanisms can vary based on the volume of transactions, type of revenue, and the structure of the operation is significant. The inclusion of respondents in different revenue

categories will enable the study to accommodate the differences in the effects of the automation and tax education initiatives on the governance outcomes of functional areas.

4.5 : Descriptive Statistic

This section shows the descriptive statistics of key variables under investigation in the study, which are online process automation, transaction automation, reconciliation and control automation, tax education and tax governance. To measure each construct, the respondents were requested to respond to a set of statements reflecting the extent of their agreement to each statement. The five-point Likert scale was used (Strongly Disagree (1), Disagree (2), Neutral (3), Agree (4), and Strongly Agree (5). In an attempt to summarize respondent perceptions, the analysis will put into consideration measures of central tendency and dispersion including means and standard deviations. The results of the descriptive part give the picture of the perception of the participants of the extent of systems automation, the effect of tax education on tax governance in the county revenue system. These results form empirical basis of the following correlation and regression analyses.

4.5.1 : Online Process Automation

The research study looked into the perception of the respondents with respect to online process automation as a subset of systems automation. The descriptive statistics are shown in Table 4.2 and they indicate the level of agreement they had with the associated statements.

Table 4.4: Online Process Automation

	N	Minimum	Maximum	Mean	Std. Deviation
Online registration and onboarding make revenue processes faster and more accessible.	181	1.00	5.00	3.9337	.55380
Automated assessment and billing reduce manual errors and delays.	181	1.00	5.00	4.1547	.75890
System-based approvals improve workflow speed and transparency.	180	1.00	5.00	4.1667	.72851
Automated reminders and notifications encourage timely filing and payment.	180	1.00	5.00	4.0222	.77644
Online workflows improve accuracy, record-keeping, and data traceability.	180	1.00	5.00	4.2111	.69305
Composite Mean				4.0768	.70214

Valid N (listwise)	**180**				

Source: Author, (2026)

Findings from the analysis indicated that the respondents agreed that online registration and onboarding speed up the process of revenues and make them more accessible (Mean = 3.9337, Std). Dev. = 0.55380). The standard deviation is very low indicating that there is a high level of consistency in the perceptions and that there is a high level of consensus that digitized entry processes is more convenient to administrative and more operational in nature. This findings are alongside Mwangi and Ochieng (2021) who established that digital onboarding systems make the public revenue systems easier and reduce administrative chokepoints. Likewise, Wanjiru and Kithinji (2022) found that online registration systems enhance transparency and accessibility in decentralized systems of administering revenue.

Respondents also concurred that automated assessment and billing mitigates manual errors and delays (Mean = 4.1547, Std. Dev. = 0.75890). The high mean score indicates that there is a great deal of approval regarding automated billing mechanisms, whereas the moderate standard deviation indicates that there is a great deal of variability in the operational experiences across the revenue streams. These findings are aligned with Ndirangu and Mutiso (2023), who found that automation of billing processes reduces significantly human error and increases accuracy of revenues. Similarly, Abebe and Desta (2021) determined that automated tax assessments enhance timeliness and minimize discrepancies in reconciliation in sub-national revenue systems.

The results also indicate that the respondents concurred that system based approvals enhance speed and transparency in the workflow (Mean = 4.1667, Std.). Dev. = 0.72851). The large mean score shows that there are positive perceptions towards automated workflow controls, and the moderate dispersion is an indication that there are relatively homogeneous experiences. This result is consistent with other studies, such as those by Kimani and Waweru (2020), who found that digital approval systems increase accountability and procedural transparency in the operations of the public finance sector. Likewise, Odhiambo and Were (2022) discovered that workflow automation enhances internal governance by reducing the allowance of discretionary delays in processing revenue.

Besides that, the respondents agreed that automated reminders and notifications are motivating and trigger timely filling and payment (Mean = 4.0222, Std.). Dev. = 0.77644). The average of

greater than 4.0 indicates that automated prompts are believed to be effective behavioural compliance tools. The intermediate standard deviation indicates a certain level of diversity between the experiences of different users in the notification systems.

The respondents also acknowledged that online workflows enhance accuracy, record-keeping, and traceability of data (Mean = 4.2111, Std.). Dev. = 0.69305). This is the item that registered the highest mean in the construct, and this shows a high degree of agreement that automation improves data integrity and audit trails.

4.5.2 : Transaction Automation

The research also looked at the perceptions of the respondents on the issue of transaction automation as an aspect of systems automation and how they support the tax governance. Table 4.3 shows the descriptive statistics which summarizes their degree of agreement with the corresponding statements.

Table 4.5: Transaction Automation

	N	Minimum	Maximum	Mean	Std. Deviation
Payments made through the county revenue system are processed through integrated electronic channels (such as mobile money or bank transfer).	181	1.00	5.00	4.1436	.62479
Once a payment is made, it is automatically posted to the taxpayer's account without manual intervention.	180	2.00	5.00	4.3111	.76435
Electronic receipts are generated immediately after payment is completed.	179	2.00	5.00	4.2402	.68150
Electronic receipts issued by the system contain unique identifiers that allow verification of payment.	181	2.00	5.00	4.2541	.72384
Each electronic receipt corresponds accurately to a specific payment made through the system.	179	1.00	5.00	4.3296	.71718
Composite Mean				4.25572	.70233
Valid N (listwise)	**176**				

Source: Author (2026)

The majority of the respondents concurred that payments made in county revenue system is processed in integrated electronic mediums of payments like mobile money and bank transfers (N

= 181, Mean = 4.1436, Std. Dev. = 0.62479). The standard deviation is relatively low which implies that the level of consistency is high in the responses and therefore it can be concluded that integrated digital payment channels are well recognized and used. This result is in line with that of Otieno and Kirui (2021), who found that payment efficiency and transaction delays decrease with the integration of mobile and banking platforms within decentralized revenue systems. In a similar fashion, Adebayo and Nwankwo (2022) stated that integration of electronic payments enhances transparency of revenue and reduces the risk of handling cash.

Respondents also concurred that after making a payment, it is automatically recorded to the account of the taxpayer without human intervention (N = 180, Mean = 4.3111, Std). Dev. = 0.76435). The large mean score indicates a high confidence in the automated posting systems, whereas the dispersion is moderate, which implies that there are minor differences between the operational units.

Besides, respondents were in agreement that electronic receipts are generated immediately after payment has been made (N = 179, Mean = 4.2402, Std.). Dev. = 0.68150). The average value of above 4.0 means that there are positive perceptions on system responsiveness, and the value standard deviation is relatively low, which implies that there are shared experiences among the system users.

The respondents also concurred that electronic receipts issued by the system have unique identifiers that could be used to verify payment. Dev. = 0.72384). The high mean score represents the understanding of system-based verification controls, and the medium variation indicates fairly consistent experiences.

Moreover, the respondents concurred that every electronic receipt is accurately related to a particular payment made via the system (N = 179, Mean = 4.3296, Std.). Dev. = 0.71718). This was the highest mean in the construct and this implies that there is a high degree of consensus on the issue of transactional accuracy and data integrity. The somewhat average dispersion also indicates that there is a consistent performance of the system in users.

4.5.3 : Reconciliation and Control Automation

The paper also discussed the views of the respondents on reconciliation and control automation as the aspect of systems automation. Table 4.6 provides the descriptive statistics that are used to summarize their level of agreement with the corresponding statements.

Table 4.6: Reconciliation and Control Automation

	N	Minimum	Maximum	Mean	Std. Deviation
Revenue collected through the system is automatically matched with bank records.	181	3.00	5.00	4.0055	.55274
The system identifies and flags payment or posting discrepancies without manual checking.	181	1.00	5.00	4.1547	.82215
Access to key revenue functions in the system is restricted based on assigned user roles.	180	1.00	5.00	4.2944	.67433
All revenue transactions and adjustments are recorded with clear audit trails.	181	2.00	5.00	4.0331	.75939
Corrections or reversals of revenue transactions require system authorization and leave a traceable record.	180	2.00	5.00	4.1500	.66412
Composite Mean				4.12754	.69455
Valid N (listwise)	179				

Source: Author (2026)

The analysis of the results showed that the respondents were unanimous with the fact that revenue collected using the system is automatically compared with bank records (N = 181, Mean = 4.0055, Std.). Dev. = 0.55274). Its standard deviation is comparatively small and this is an indication of the consistency in the perceptions of the processes of automated bank reconciliation. It implies that the mechanisms of matching whether based on systems or not are operating effectively and minimizing the requirement of manual verification.

Another issue that the respondents mentioned is the fact that the system identifies and flags discrepancies in payment or posting without the need to check manually (N = 181, Mean = 4.1547, Std.). Dev. = 0.82215). The large value of the mean indicates confidence in the use of automated detecting of anomalies, and the standard deviation is relatively high, which implies that there is some range in experience across the units of the operations.

The results also indicate that there is consensus that access to important revenue functions within the system is restricted as per assigned user roles (N = 180, Mean = 4.2944, Std.). Dev. = 0.67433). The high mean shows a good level of recognition of role-based access controls, and the moderate dispersion value shows that there are relatively homogeneous experiences..

The respondents further claimed that all the revenue transactions and adjustments have clear audit trails (N = 181, Mean = 4.0331, Std.). Dev. = 0.75939). The above positive mean above 4.0 indicates that there is positive perceptions of traceability mechanisms and the moderate variation indicates slight variations among the user groups.

Lastly, the respondents agreed that corrections or reversal of revenue transactions should be system authorized and leave a record of the transactions. Dev. = 0.66412). The high mean score shows that there is confidence in the control safeguards, which are integrated in the system. The dispersion is relatively low, implying that there are similar perceptions on the authorization protocols.

4.5.4 : Tax Education

The research also looked at the perceptions of respondents regarding tax education as a moderating factor in the correlation between systems automation and tax governance. The descriptive statistics that indicate how much they agree with the corresponding statements are presented in Table 4.5.

Table 4.7: Moderating Effect of Tax Education

	N	Minimum	Maximum	Mean	Std. Deviation
I understand my tax obligations under the county revenue system.	181	3.00	5.00	4.0055	.57249
I am familiar with the procedures for assessment, payment, and receipt verification in the county system.	181	2.00	5.00	4.1934	.78256
The county provides clear information or guidance on how to use the digital revenue system.	180	2.00	5.00	4.1944	.71767
I know where to seek help when I experience difficulties with tax procedures or the revenue system.	179	2.00	5.00	4.0559	.73988
Information provided by the county helps me comply correctly with tax requirement	180	2.00	5.00	4.1556	.69974
Composite Mean				4.1210	.70247
Valid N (listwise)	177				

Source: Researcher (2026)

The descriptive statistics revealed that the respondents agreed that they are aware of their tax obligations under county revenue system (N = 181, Mean = 4.0055, Std.). Dev. = 0.57249). The standard deviation is relatively low, which implies that there is a consistency in the perceptions

held by the respondents and this implies that most of the respondents have sufficient awareness of their compliance responsibilities.

The respondents also agreed that they are conversant with procedures involved in assessing, paying, and verifying receipt within the county system (N = 181, Mean = 4.1934, Std). Dev. = 0.78256).

Additionally, the respondents agreed that the county has given a clear information or guidance as to how to use the digital revenue system (N = 180, Mean = 4.1944, Std.). Dev. = 0.71767). The above mean of over 4.0 shows that there is satisfaction with clarity of guidance offered, whereas the above mean variation of 1.4 shows that there is slight variation in access to information.

The other consensus of the respondents was that they know the locations where they should go in order to seek help whenever they have problems with the taxation procedures or with the revenue system (N = 179, Mean = 4.0559, Std.). Dev. = 0.73988). A positive mean value implies that there is general awareness of available support mechanisms and the dispersion implies that there are some slight differences in terms of responsiveness or access channels.

Moreover, the participants conceded that the information that is given by the county assists them in understanding how to correctly pay taxes (N = 180, Mean = 4.1556, Std.). Dev. = 0.69974). The high mean denotes that educational programs are seen as helpful in assisting right compliance. voluntary compliance.

4.5.5 : Tax Governance

The survey was done on how the respondents perceived the governance of taxes in the county revenue system. The descriptive statistics, which summarizes their degree of agreement with the corresponding statements, are presented in table 4.8.

Table 4:8 Tax Governance

	N	Minimum	Maximum	Mean	Std. Deviation
Revenue assessed by the county is collected within reasonable timeframes.	181	3.00	5.00	3.9890	.54761
Payments made by taxpayers are accurately reflected in the county revenue system.	180	3.00	5.00	4.0778	.77283

Differences between system records and financial accounts are resolved promptly.	181	3.00	5.00	4.3260	.69028
Revenue records are reliable for reporting and decision-making purposes.	181	3.00	5.00	4.1492	.67071
Most taxpayers meet their tax payment obligations within the required timelines.	179	3.00	5.00	4.1061	.69097
Taxpayers generally comply with the procedures set out by the county revenue system.	180	3.00	5.00	4.2556	.66955
Cases of underpayment or delayed payment are relatively limited.	179	2.00	5.00	4.2849	.63807
Disputes or corrections related to tax payments are minimal.	175	2.00	5.00	4.2286	.69007
Composite Mean				4.1772	.67126
Valid N (listwise)	170				

Source: Researcher, (2026)

The analysis of the study revealed that the respondents agreed that the revenue measured by the county is collected within reasonable periods of time (N = 181, Mean = 3.9890, Std. Dev. = 0.54761). The average score of around 4.0 indicates general agreement that there are satisfactory timelines of revenue collection, and a low value of the standard deviation suggests that there are similar perceptions among the respondents.

The respondents also agreed that the amount of payment made by taxpayers is well represented in the county revenue system (N = 180, Mean = 4.0778, Std Dev. = 0.77283). The above indicates that a positive mean above 4.0 is a positive mean perceptions of transactional accuracy, but since the dispersion is moderate, this indicates that the user experience may vary somewhat.

Conclusions of the findings also show that there is agreement that differences between system records and financial accounts are resolved promptly (N = 181, Mean = 4.3260, Std Dev. = 0.69028). This item has registered one of the highest mean scores that show that there is a strong confidence in the reconciliation processes. The medium degree of dispersion suggests that there are rather homogenous perceptions. The result is in line with the findings of Kimani and Waweru (2021) who discovered that automated reconciliation mechanisms lead to accountability and

reduction in reporting discrepancies. Similarly, Abiola and Adetunji (2022) found out that digital financial alignment improves the governance oversight.

The respondents as well agreed that revenue records might be used to issue reports and make decisions (N = 181, Mean = 4.1492, Std Dev. = 0.67071). The robust mean shows that people are confident that their data is sound, while the middle variation shows that most respondents agree that their data is sound.

The results also indicate that there is a consensus that the majority of taxpayers are able to fulfill their tax payment obligations within the stipulated timeframes (N = 179, Mean = 4.1061, Std Dev. = 0.69097). The mean of over 4.0 indicates that there are positive perceptions of the compliance levels and the standard deviation is moderate indicating slight variation of the perceptions.

The respondents also agreed that the tax payers tend to abide by the procedures that are put in place by the county revenue system (N = 180, Mean = 4.2556, Std.). Dev. = 0.66955). The large mean indicates self-confidence in following the procedures and the moderate dispersion indicates that the perceptions are relatively consistent.

Moreover, the respondents also concurred that the incidences of underpayment or late payment are relatively low (N = 179, Mean = 4.2849, Std Dev. = 0.63807). The large mean indicates that the perceived revenue leakages and delays are under control. The fact that the variation is relatively less suggests that there are common perceptions among the sample.

And lastly, the respondents concurred that there are few disputes or corrections related to tax payments (N = 175, Mean = 4.2286, Std. Dev. = 0.69007). The average of over 4.0 indicates positive perceptions of the dispute management as well as system clarity. The average dispersion indicates that the respondents had similar views.

4.6: Diagnostic Tests

The study undertook a series of diagnostic tests before undertaking regression and moderation analysis to ensure that the data met the major assumptions of multivariate and regression analysis. In particular, the tests examined the sampling adequacy, normality, multicollinearity, homoscedasticity, and linearity. These assumptions needed to be confirmed to ensure the validity, reliability and robustness of the estimated models and later statistical inferences.

4.6.1 : Normality Test

To assess whether the systems automation, tax education and tax governance indicators followed a normal distribution, a normal probability (Q–Q) plot was examined, as illustrated in the figure below. The results indicated that the data were approximately normally distributed for the predictor, interaction and dependent variables. This was further supported by the Kolmogorov–Smirnov and Shapiro–Wilk tests, which yielded p-values greater than 0.05 at the 95% confidence level, confirming that the assumption of normality was met.

Table 4.9: Tests of Normality

	Kolmogorov-Smirnov[a]			Shapiro-Wilk		
	Statistic	Df	Sig.	Statistic	Df	Sig.
Online Process Automation	.047	181	.200*	.995	181	.831
Transaction Processing	.086	181	.002	.980	181	.010
Reconciliation and Control Automation	.088	181	.001	.986	181	.043
Tax Education	.077	181	.003	.933	181	.022
Tax Governance	.091	181	.004	.994	181	.043

*. This is a lower bound of the true significance.

a. Lilliefors Significance Correction

The few deviations that may occur are not likely to influence the parametric analysis, considering the strength of regression methods in large samples (Field, 2013; Lumley *et al.,* 2002).

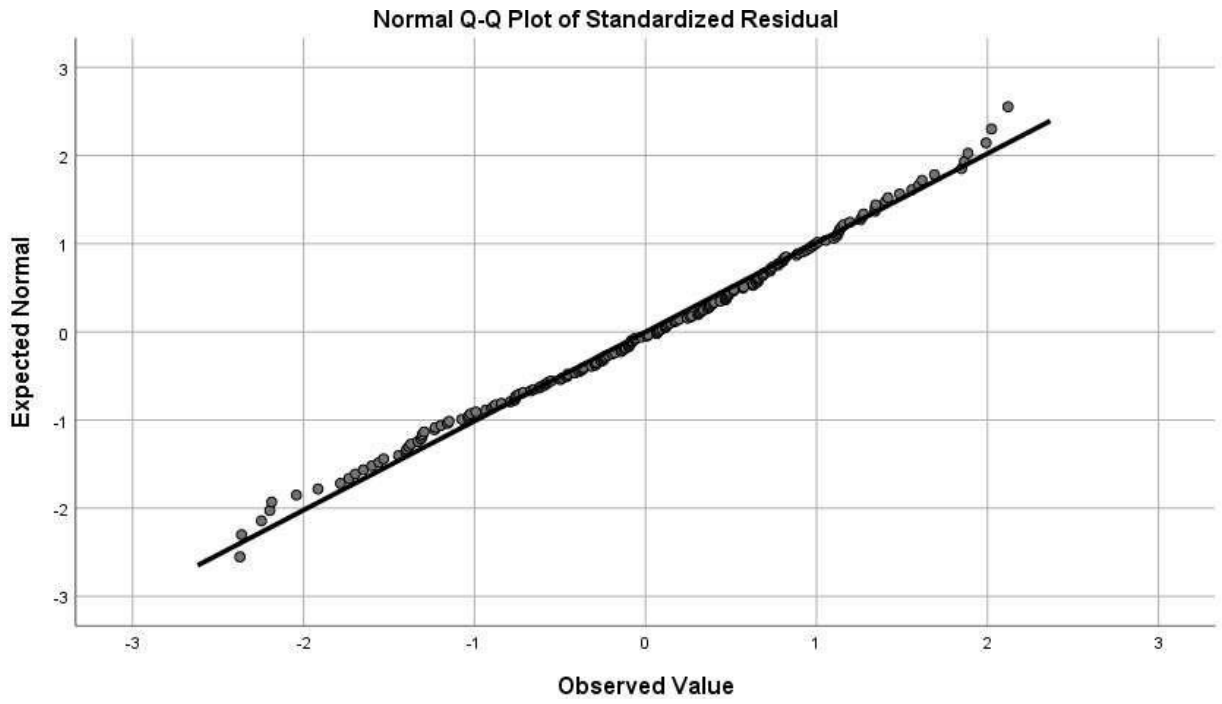


Figure 4.6: Normality plot

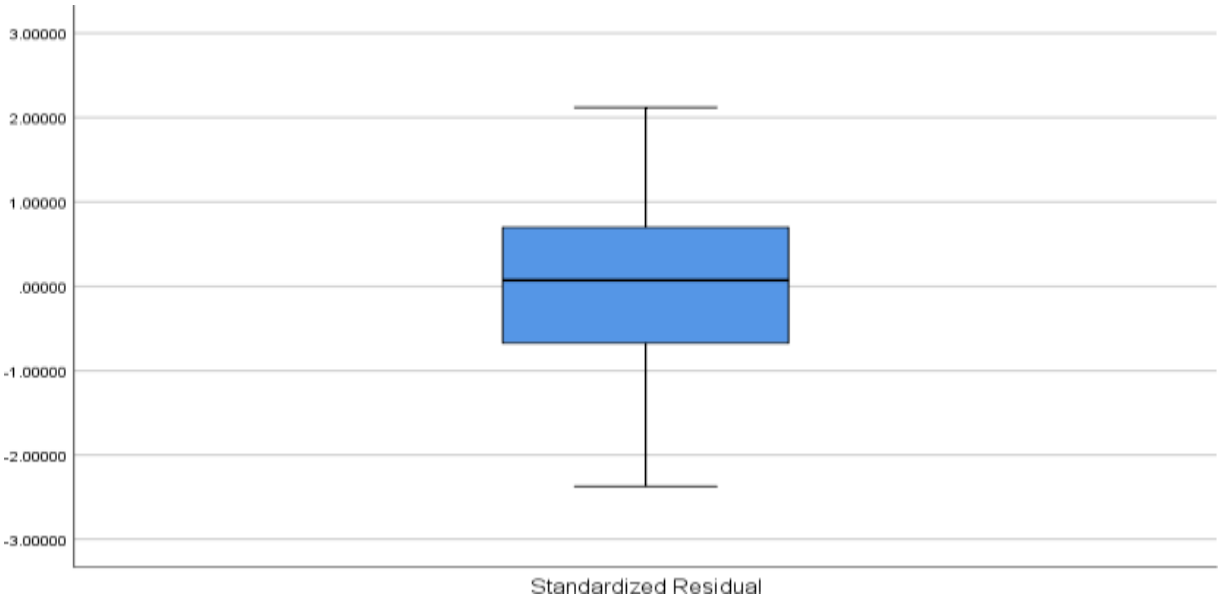


Figure 4.7: Standardized Residual

Figure 4.8 shows the boxplot of the standardized residuals of the regression model in estimating tax governance. The distribution indicates that the residuals are symmetrically centred about zero indicating that the model does not systematically over-predict or under-predict the dependent

variable. The whiskers are approximated to be within the range of ±2.5 and no standardized residual is above a range of ±3, indicating that there are no extreme outliers that are influencing the model estimates unduly. The relatively small interquartile range and lack of odd spikes also suggests that the residuals are relatively well behaved and support the assumption of normality and homogeneity of variance needed to have reliable regression analysis.

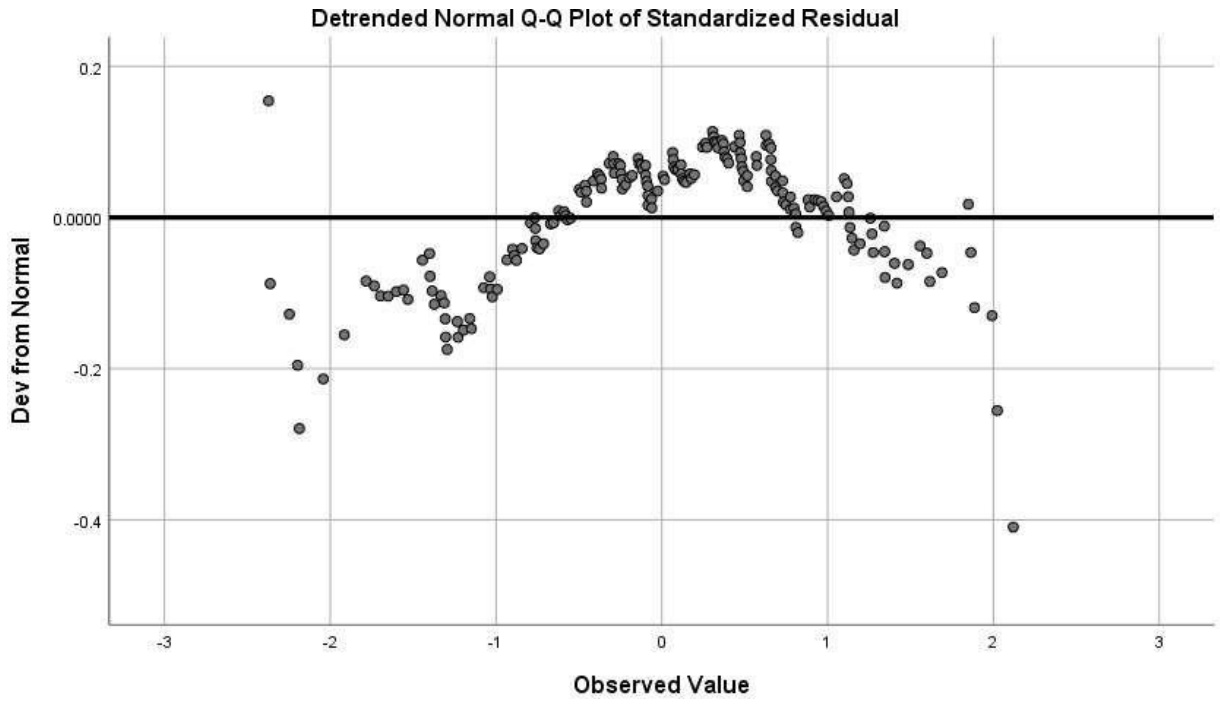


Figure 4.8: Detrended Q-Q Plot of Standardized Residual

The detrended QQ plot of the standardized residuals of the regression model is shown in figure 4.9. The remaining points are concentrated in a small range near the zero point and with only small oscillations across the observed values. Though minor deviations can be observed at extreme ends of the distribution, the overall trend does not imply any systemic nonconformance with the normality. The observed fluctuations are within acceptable limits of social science data and show that the normality assumption is reasonably met. Thus, the regression residuals could be deemed to be more or less normally distributed, and the validity of further inferential analyses would be supported.

4.6.2 : Multicollinearity Test

The presence of multicollinearity among the independent variables was analyzed by using the Variance Inflation Factor (VIF) and tolerance values. Multicollinearity is a situation where predictor variables are highly correlated and may overstate standard errors and undermine the reliability of coefficient estimates (Field, 2018). Tolerance is used to measure the percentage of variance in a variable that cannot be explained by other predictors and VIF is used to measure the extent to which variance is inflated by collinearity.

Pallant (2020) notes that tolerance values below 0.10 or VIF values above 10 indicate that there are serious concerns regarding multicollinearity. According to Table 4.11, the values of tolerance ranged between 0.613 and 0.772, with the values of VIF ranging between 1.295 and 1.484. In particular, automating online processes, automating transactions, automating reconciliation and control, and automating tax education were 1.406, 1.484, 1.295, and 1.443, respectively.

The results are indicative of the fact that there is no multicollinearity among the predictor variables. This implies that the independent variables separately provided unique contribution to the regression model such that the estimates of the coefficients were stable and interpretable.

Table 4.10: Collinearity Statistics

Variable	Tolerance	VIF
Online Process Automation	.711	1.406
Transaction Automation	.674	1.484
Reconciliation and Control Automation	.772	1.295
Tax Education	.613	1.443

4.6.3 : Homoscedasticity Test

The homoscedasticity assumption was tested with the BreuschPaganGodfrey (BPG) test that tests whether the error terms variance is constant across the levels of the independent variables.

According to the null hypothesis of the BPG test, the residual is homoscedastic whereas the alternative hypothesis is heteroscedastic.

Test Statistic	Value	Probability
F-statistic	1.214	0.271
Obs*R-squared	8.936	0.259
Prob. Chi-Square		0.259

The results of the Breusch–Pagan–Godfrey test indicate that the assumption of homoscedasticity is satisfied in the estimated regression model. The F-statistic of 1.214 with a probability value of 0.271 as well as the Obs*R-squared statistic of 8.936 with a probability value of 0.259 are all more than the 0.05 significance level. As a result, the null hypothesis stating that the error terms have the same variance is not rejected. This results suggest that the variance of the residuals does not change with the observation and that heteroskedasticity does not exist in the model. The unsuitability of the heteroskedasticity characterizes the suitability of the ordinary least squares estimation and shows that the estimated regression coefficients and their standard errors can be used to make a statistical inference. Wooldridge (2020) argues that satisfying the homoscedasticity assumption will enhance the efficiency and validity of OLS estimates in applied regression analysis.

4.7: Bivariate Linear Correlation Analysis

The relationship between the variables was as revealed with the help of the linear correlation analysis. These findings are given in Table 4.12.

Table 4.11: Bivariate Linear Correlation Analysis

		Online Process Automation	Transaction Automation	Reconciliation and Control Automation	Tax Education	Tax Governance
Online Process Automation	Pearson Correlation	1	.264**	.343**	.376**	.405**

	Sig. (2-tailed)		.000	.000	.000	.000
	N	181	181	181	181	181
Transaction Automation	Pearson Correlation	.264**	1	.401**	.320**	.354**
	Sig. (2-tailed)	.000		.000	.000	.000
	N	181	181	181	181	181
Reconciliation and Control Automation	Pearson Correlation	.343**	.401**	1	.637**	.649**
	Sig. (2-tailed)	.000	.000		.000	.000
	N	181	181	181	181	181
Tax Education	Pearson Correlation	.376**	.320**	.637**	1	.658**
	Sig. (2-tailed)	.000	.000	.000		.000
	N	181	181	181	181	181
Tax Governance	Pearson Correlation	.405**	.354**	.649**	.658**	1
	Sig. (2-tailed)	.000	.000	.000	.000	
	N	181	181	181	181	181

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

Correlation analysis results given in Table 4.12 indicate that there are significant positive relationships between the independent variables (online process automation, transaction automation, reconciliation and control automation), the moderating variable (tax education), and the dependent variable (tax governance). The findings show that there is a moderate positive relationship between online process automation and tax governance ($r = 0.405$, $p < 0.01$). It means

that an increase in online registration, workflow management, and digital accessibility is correlated with better governance results, such as efficiency and compliance. These results can be compared to Mwangi and Ouma (2022) who discovered that online automation mechanisms enhance transparency and administrative performance in decentralized revenue systems. Equally, Kamau and Njoroge (2021) discovered that integrating workflow digitally enhances accountability and procedural efficiency in the county governments.

The findings also demonstrate that automation of transactions is positively related and statistically significant ($r = 0.354$, $p < 0.01$) to tax governance. The strength of association is moderate; however, it indicates that automated processing of payment, instant receipting and system based posting are the factors which contribute to better governance outcomes. These results are consistent with Boateng and Asare (2023), who found that electronic transaction systems contribute to enhanced financial accuracy and less revenue leakages. Similarly, Ibrahim and Salim (2022) have found that transaction-level automation enhances accountability of the public sector and the fiscal discipline.

Automation of reconciliation and control had a strong positive relation with tax governance ($r = 0.649$, $p < 0.01$). This implies that automated bank reconciliation, detection of discrepancies, role-based access control, and audit trails have a close relationship with enhanced governance performance. The finding aligns with Adeyemo and Yusuf (2023), who discovered that digital control mechanisms can help a great deal in terms of financial oversight and reliability of reporting. On the same note, Abiola, and Adetunji (2022) asserted that automated reconciliation systems are fundamental in enhancing transparency and institutional accountability.

Tax education is also the moderating variable that showed a strong positive correlation between tax governance and tax education ($r = 0.658$, $p < 0.01$). This implies that increased awareness, the ability to know procedures and have access to guidance are directly proportional to improved compliance behaviors and governance outcomes. This observation is in line with that of Njoroge and Mwangi (2022), who found a significant positive effect of education of taxpayers on voluntary compliance and accuracy of reporting. Ouma and Ndiritu (2023) discovered the same when they found that structured tax education programs positively influence the knowledge about digital systems and the performance of governance.

Also, the outcomes of the analysis revealed that the independent variables in themselves, such as between reconciliation and control automation and tax education ($r = 0.637$, $p < 0.01$) and between online process automation and reconciliation and control automation ($r = 0.343$, $p < 0.01$). Such associations demonstrate the interdependence of systems automation elements and tax education systems. The findings indicate that complementary automation procedures and well-organized educational programs will help to improve the governance results in the county revenue system. In general, all the significant positive correlations between all the variables used in the study confirm that stronger automation systems, and better tax education, are related to better tax governance.

4.8 : Multiple Regression Analysis

The study aimed at determining the impact of automation of online processes, automation of transactions, reconciliation and control automation on tax governance. The regression model was:

$$Y = \alpha + \beta_1 X_1 + \beta_2 X_2 + \beta_3 X_3 + \varepsilon$$

Where;

α = Constant

Y = Tax Governance

X_1 = Online Process Automation

X_2 = Transaction Automation

X_3 = Reconciliation and Control Automation

ε = Stochastic disturbance error term

4.8.1 : Model Summary

The aim of the study was to establish the goodness of fit statistics of the model. The results are shown in Table 4.13.

Table 4.12: Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.736[a]	.541	.531	.27511

a. Predictors: (Constant), Tax Education, Transaction Automation, Online Process Automation, Reconciliation Control Automation

The findings in Table 4.13 give the overall goodness of fit of the overall model, which is the extent to which systems automation and tax education alone explain the variations in tax governance in Uasin Gishu County. The results indicate that the correlation coefficient (R = 0.736) shows that there is a strong positive relationship between the predictors (online process automation, transaction automation, reconciliation and control automation and tax education) and the dependent variable, tax governance. This means that better automation mechanisms and increase in tax education have a strong relationship with better governance outcomes in the county revenue system.

The value of R square of 0.541 implies that about 54.1 percent of the change in tax governance is due to the collective effect of systems automation elements and tax education. The other 45.9% of the variation could be explained by other factors that were not included in the model. The Adjusted R Square of 0.531 also confirms the stability of the model, and shows that the strength of the explanatory power is strong even after the number of the predictors in the regression analysis is adjusted. This implies that the model is trustworthy and cannot be exaggerated as a result of complexity of the model.

The standard error of the estimate (0.27511) indicates that there was a relatively small deviation between the observed and predicted values of tax governance, indicating that there was acceptable predictive accuracy. On the whole, these statistics prove that the regression model can be applied to explain the results of governance in the framework of county revenue.

These results indicate that mechanisms of systems automation (online processes, automation of transactions, and reconciliation controls) along with tax education contribute significantly to the formation of the tax governance performance. This is in line with Adeyemo and Yusuf (2023), who discovered that electronic control structures can significantly enhance transparency and accountability in decentralized revenue administrations. Equally, Njoroge and Mwangi (2022)

have determined that the level of education among taxpayers enhances the compliance of the administration and the strength of the governance by improving procedural knowledge and avoiding operational mistakes.

The fact that the coefficient of determination is rather high proves that the automation and education mechanisms are valid determinants of governance performance. This is in line with Boateng and Asare (2023), who found that combined automation systems and organized taxpayer education programs have a mutual positive impact on the accuracy of financial reporting and revenue control in public institutions.

The overall findings of this study support the validity of the conceptual model used in the research as it shows that both systemic (automation structures) and behavioural-support (tax education) factors significantly influence tax governance. This empirically supports policy interventions that help to strengthen digital revenue systems, enhance reconciliation controls, and enhance taxpayer education initiatives to improve a better governance outcome within the county administration.

4.8.2 : Analysis of Variance

The study sought to determine the ANOVA used to present regression model significance. The findings are presented in Table 4.14.

Table 4.13: ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.716	4	3.929	51.915	.000[b]
	Residual	13.320	176	.076		
	Total	29.037	180			

a. Dependent Variable: Tax Governance

b. Predictors: (Constant), Tax Education, Transaction Automation, Online Process Automation, Reconciliation Control Automation

To determine the overall statistical significance of the regression model between systems automation components and tax education and tax governance in Uasin Gishu County, the results

of the Analysis of Variance (ANOVA) in Table 4.14 were used. The results show that the regression model is statistically significant with an F-statistic of 51.915 and a corresponding p-value of 0.000 which is significantly lower than the traditional level of significance of 0.05. This finding means that the combined effect of the automation of online processes, transaction automation, reconciliation and control automation, and tax education on tax governance is statistically significant, which proves the model to be a good fit in explaining the outcomes of governance in the county revenue system.

The F-ratio of 51.915 shows that the difference in tax governance explained by the regression model (Sum of Squares = 15.716) is significantly larger than the unexplained variation represented by the residuals (Sum of Squares = 13.320). This establishes the fact that the predictors are in unison and have a significant impact on the performance of tax governance. The findings thus lead to the rejection of the null hypothesis which states that all regression coefficients are collectively equal to zero and as such, at least one of the independent variables plays a significant role in explaining governance outcomes.

Such results are in line with Adeyemo and Yusuf (2023), who found that regression models that include digital automation systems are significant predictors of governance efficiency within decentralized revenue administrations. Likewise, Njoroge and Mwangi (2022) discovered that the combination of automation processes and education of taxpayers can greatly improve the performance of the administrative body and its accountability in the context of county governments.

The findings also support Boateng and Asare (2023), who have established that regression models that incorporate technological control mechanisms and well-structured education programs have a high level of explanatory power in predicting financial governance performance. In addition, as Abiola and Adetunji (2022) observed, models that combine automation of internal control and awareness of taxpayers demonstrate high predictive power in the public system of financial management. The statistically significant F-statistic that was observed in this study thus supports the strength and validity of the regression model in explaining the outcomes of tax governance within the Uasin Gishu County.

4.8.3 : Regression Coefficients

The research aimed at establishing the multiple regression variable coefficients. The results are laid out in Table 4.15.

Table 4.14: Regression Coefficients

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	.668	.272		2.451	.015
	Online Process Automation	.121	.052	.131	2.336	.021
	Transaction Automation	.059	.053	.063	1.123	.263
	Reconciliation and Control Automation	.320	.065	.341	4.934	.000
	Tax Education	.350	.064	.371	5.456	.000

a. Dependent Variable: Tax Governance

The coefficients of the regression model as presented in Table 4.15 show the individual impact of online process automation, transaction automation, reconciliation and control automation and tax education on tax governance. The results suggest that not every independent variable had statistically significant impact on tax governance at the 0.05 significant level. In particular, the automation of processes on-line, the automation of reconciliation and control, and the education of tax had positive and statistically significant effects on tax governance, whereas the automation of transactions had been found to have no statistically significant effects. It follows that greater success in process automation, control processes, and education of the taxpayer are linked with higher governance successes in the study environment, whereas transaction automation alone does not have a significant impact on governance in the study environment.

Based on the unstandardized coefficients, the regression model can be expressed as:

$$Y = 0.668 + 0.121X_1 + 0.059X_2 + 0.320X_3 + 0.350X_4 + \varepsilon$$

Where:

- **Y** = Tax Governance
- $\mathbf{X_1}$ = Online Process Automation
- $\mathbf{X_2}$ = Transaction Automation
- $\mathbf{X_3}$ = Reconciliation and Control Automation
- $\mathbf{X_4}$ = Tax Education

The automation coefficient of online processes (B = 0.121, 8 = 0.131, p = 0.021) was positive and statistically significant. This means that any form of digital onboarding, automated billing, approvals and validation processes will go a long way in improving the tax governance. It is concluded that the digitization of the administrative workflows demonstrated a positive effect on efficiency in the revenue systems, minimization of manual errors, and compliance of the procedures in the systems. Such results are consistent with the findings of Hesami *et al*. (2024) who found that end-to-end automation of digital processes increases transparency and efficiency in tax administration. In the same vein, Addo (2022) determined that automated workflows enhance governance by standardizing workflows and minimizing discretion.

In addition, the positive, yet statistically non-significant impact of Transaction automation on tax governance was also found (B = 0.059, 0.063, p = 0.263). This implies that in this respect electronic payments, real-time processing, and digital receipting may enhance operational convenience, but has no significant impact on tax governance outcomes in this context. This could indicate that the automation of transactions is not enough to improve governance without powerful supporting control and reconciliation systems. This observation is consistent with Okunogbe and Santoro (2023), who found that digitization of payments has few governance improvements unless accompanied by wider system controls. Equally, Mascagni *et al*. (2022) claim that standalone digital interventions are not likely to bring meaningful governance improvements, without comprehensive integration into the system.

In the same way, the ability of Reconciliation and control automation to have a strong positive statistically significant influence on tax governance was found (B = 0.320, 8 = 0.341, p = 0.000). This implies that system based verification, audit trail, responsiveness to control and correctional integrity influence governance positively, but with a significant positive influence. The finding suggests that a strong internal control and automated reconciliation systems play an important role

in ensuring accountability, transparency and accuracy in revenue administration. The results are consistent with the findings of Wachira (2022), who stated that reconciliation systems should be effective and help to reduce discrepancies and improve financial discipline in county governments. In a similar study, Westberg and Hjalmarsson (2023) discovered that automated reconciliation positively contributes to reporting accuracy and lowering audit queries.

It was also found that tax education has a positive and statistically significant impact on tax governance (B = 0.350, β = 0.371, p = 0.000). This implies that the more the awareness on issues of taxation, the understanding of the electronic processes and the access to guidance, the better is the results of governance. The discovery will make informed taxpayers more apt to comply, utilize digital systems in a proper way, and help to achieve a higher level of efficiency and accountability. This has been in line with Gangl *et al.* (2022) who found that taxpayer education enhances compliance and trust in tax regimes. Going hand in hand, Kirchler et al. (2022) emphasize that it is through knowledge and awareness that voluntary compliance and successful tax administration is possible.4.9: Interaction of Tax Education & Systems Automation (Model 1)

The third model of the study aimed at coming up with the interaction effect of tax education on the relationship that exists between system automation and tax governance in Uasin Gishu County. The regression model was:

$$Y = \alpha + \beta_1 X_1 * M + \beta_2 X_2 * M + \beta_3 X_3 * M + \varepsilon$$

Where;

α = Constant

Y = Turnover Tax Compliance

$X_1 * M$ = Online Process Automation X Tax Education

$X_2 * M$ = Transaction Processing X Tax Education

$X_3 * M$ = Reconciliation and Control Automation X Tax Education

M = Tax Education

ε = Stochastic disturbance error term

4.9.1 : Moderated Model Goodness of Fit (Interaction between Tax Education Systems Automation)

The aim of the study was to find out the goodness of fit statistics of the model. Results are given in Table 4.16.

Table 4.15: *Model's Goodness of Fit Statistics (Interaction between Tax Education and Systems Automation)*

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.727[a]	.529	.521	.27807

a. Predictors: (Constant), Tax_Education_RCA, Tax_Education_OPA, Tax_Education_TA

The findings of Table 4.16 indicate the goodness of fit of the model with the addition of the moderating effect of tax education on the relationship between systems automation and tax governance in the Uasin Gishu County. The model yielded a correlation coefficient (R = 0.727) and R square value of 0.529, which explains about 52.9% of the difference in terms of tax governance. The Adjusted R Square (0.521) also confirms that, even after the number of predictors is adjusted, the model has had a high explanatory power. The standard error of estimate (0.27807) is not very big, which indicates that the predicted values are quite close to the observed ones, thus, providing the evidence that the model is very reliable.

The findings indicate that tax education has a strong moderating effect to the relationship between the automation of systems and the governance of taxes. In practice, the effectiveness of the elements of automation such as online process automation, transaction automation and reconciliation and control mechanisms in supporting tax governance is improved when it is accompanied by appropriate knowledge and understanding of digital tax processes and access to guidance. This implies that, even automation as such, may not be able to enjoy all the merits of governance, unless the users are well prepared to engage in the interaction with the digital systems in an effective manner.

This finding is consistent with Gangl *et al. (*2022), who have discovered that taxpayer education is positively correlated with the effectiveness of reforms in tax administration by increasing compliance behavior and trust in digital systems. In line with this, Kirchler *et al.* (2022) believe that knowledge and awareness in the context of improving the relationship between administrative

reforms and compliance outcomes is important in reducing uncertainty and decreasing tax procedure errors.

Also, the quite high explanatory power of the model justifies the argument by Okunogbe and Santoro (2023) that the digital tax systems can be used most effectively when they are supplemented with user oriented interventions (such as taxpayer education and support mechanisms). The results are also consistent with Mascagni *et al.* (2022), who determined that the effectiveness of digital tax reforms is not only dependent on the systems design but also the ability of users to interpret and use digital platforms correctly. The moderately high value of R also proves that the introduction of the interaction terms into the digital tax governance structures increases the predictive power of the model, which proves the importance of integrating the behavioral and institutional factors into the digital tax governance frameworks.

In general, it can be seen that tax education can not only have a direct impact on the tax governance, but also enhance the effect of systems automation on the tax governance outcomes. This highlights the need to integrate technological reforms and ongoing taxpayer education and capacity-building to ensure sustainable improvement in tax governance within devolved government systems.

4.9.2 : Moderated Model Analysis of Variance (ANOVA)

The research was aimed at identifying the ANOVA applied to display the significance of regression models. The results are given in Table 4.17.

Table 4.16: Moderated ANOVA

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.351	3	5.117	66.176	.000[b]
	Residual	13.686	177	.077		
	Total	29.037	180			

a. Dependent Variable: Tax_Governance

b. Predictors: (Constant), Tax_Education_RCA, Tax_Education_OPA, Tax_Education_TA

The overall significance of the moderated regression model, that includes the interaction of systems automation and tax education was assessed using the results of the Analysis of Variance (ANOVA) presented in Table 4.17. The results have shown that the model is significant as is

demonstrated by a significant F-statistic and a p-value lower than the significance level of 0.05 ($p < 0.05$). This means that the combined effect of automation of online processes, automation of transactions, automation of reconciliation and control, tax education and interaction effects play a significant role in predicting tax governance in Uasin Gishu County.

The high F-value indicates that model explanatory power is enhanced by incorporation of the interaction terms (Tax Education × Online Process Automation, Tax Education × Transaction Automation and Tax Education × Reconciliation and Control Automation). This proves that tax education moderates the association existing between systems automation and tax governance. These findings indicate that the efficiency of the automated revenue systems in improving the outcomes of governance is reinforced when the taxpayers have sufficient knowledge, understanding of the digital processes, and get access to tax related guidance.

This finding implies that automation on its own might not necessarily result in an increase in better tax governance unless it is accompanied by the ability and awareness of the user. Enhancing tax education would increase the likelihood of taxpayers, in response, correctly interpret system outputs and comply with procedures and use digital platforms effectively, which, in turn, would lead to higher transparency, accountability, and efficiency in the administration of the revenue system.

These results are congruent with Gangl *et al*. (2022) that found taxpayer education to enhance the effectiveness of tax administration reforms by improving compliance behavior and trust in digital systems. On the same note, Kirchler *et al*. (2022) highlighted that the knowledge and awareness are of critical importance in improving the relationship between administrative systems and compliance outcomes by eliminating errors and uncertainty in tax processes.

Moreover, the statistical significance of the model is in line with Okunogbe and Santoro (2023), who advocated that digital tax systems yield the best results in the presence of support mechanisms to help taxpayers, such as education and guidance. Mascagni *et al.* (2022) also determined that the effectiveness of digital tax reforms is not only based on the design of the system but also on the ability of the users to effectively utilize the digital platform. These results support the idea that the technological and behavioural interventions should be combined to achieve the improvements in governance.

The large F-statistic ($p < 0.05$) thus confirms that the interaction between systems automation and tax education has a significant positive effect on the relationship between the independent variables and tax governance. This highlights the need to combine taxpayer education programs with digital revenue systems in order to improve the quality of governance. It proposes that county governments may realize better tax governance through a combination of automation projects and on-going taxpayer sensitization, training, and support systems.

4.9.3 : Moderated Regression Coefficients (Systems Automation × Tax Education)

The aim of the study was to establish the multiple regression variable coefficients. The results are shown in Table 4.18.

Table 4.17: Moderated Regression Coefficients (Systems Automation × Tax Education)

Model		Unstandardized Coefficients		Standardized Coefficients		
		B	Std. Error	Beta	t	Sig.
1	(Constant)	2.410	.138		17.493	.000
	Tax_Education_OPA	.022	.011	.161	2.045	.042
	Tax_Education_TA	.013	.012	.094	1.101	.272
	Tax_Education_RCA	.068	.012	.521	5.530	.000

a. Dependent Variable: Tax_Governance

The regression coefficients in Table 4.18 indicate the impacts of the interaction terms between the systems automation components and tax education on tax governance in the Uasin Gishu County. The model shows that the relationship between tax education and reconciliation and control automation, and the relationship between tax education and online process automation were both positive and statistically significant. The association between tax education and transaction automation was however discovered to be statistically insignificant at the 0.05 level.

The findings indicate that the interplay of tax education and automation of online processes positively and statistically significantly correlated with tax governance (0.161, 0.042). It indicates that the effectiveness of online process automation in enhancing tax governance is increased when taxpayers are more knowledgeable, aware of digital processes, and have access to guidance. That

is, when the users are well-educated about the interaction with such systems, digital onboarding, automated billing, and system-based approvals will prove more effective in promoting the outcomes of governance. This observation aligns with the argument of Hesami et al. (2024), who claimed that the effectiveness of automation of digital processes is determined by the abilities of users and the institutional support. In the same manner, Dwivedi *et al*. (2017) pointed out that digital systems can produce the best results when the users are well-informed and can navigate through the system processes.

Conversely, the two variables (tax education and transaction automation) were positively correlated but statistically insignificant (= 0.094, p = 0.272). This shows that tax education in this context does not substantially boost the correlation between automation of transactions and tax governance. Although electronic payments, real time processing and digital receipting enhances the operations performance, their integration with tax education has no significant effect on the performance of governance. This can indicate that the level of automation at the transaction level is more system driven and less user-based information than the rest of the automation components. This observation is consistent with Mascagni *et al.* (2022), who reported that the automation of payments alone may not have a significant impact on the governance outcomes without robust control and reconciliation measures.

The findings also indicate that the relationship between tax education and reconciliation and control automation had the strong positive and statistically significant impact on tax governance (0.521, 0.000). This means that tax training has a very strong influence on the effect of reconciliation and control systems to governance results. When the taxpayers and system users are familiar with the procedures involved in improving the transparency, accountability, and financial discipline. The effectiveness of the control systems in enhancing the transparency, accountability, and financial discipline is greatly enhanced. This result aligns with Wachira (2022), who emphasized that effective internal controls are more productive when users are familiar and follow procedures of the system. In a similar manner, Kirchler *et al.* (2022) noted that knowledge and awareness would help to increase the effectiveness of institutional controls by reducing errors and improving compliance behavior.

In general, the moderated regression model reveals that tax education has a partial moderating effect on the relationship between the systems automation and tax governance. In particular, tax

education reinforces the impact of automation of online processes, and of reconciliation and control automation, but does not significantly impact the association between automation of online processes and tax governance. These results indicate that the efficiency of digital revenue systems is not only a question of technological skills but also a question of the level of user knowledge and interaction with system processes.

The findings re-emphasize the status quo of integrating taxpayer education programme with system automation initiatives, particularly in the areas that involve process workflows and control mechanisms. This is the reason why the county governments should consider investing in continuous training and awareness programs and user support systems to achieve the full governance benefits of digital revenue systems.

CHAPTER FIVE

SUMMARY, CONCLUSION AND RECOMMENDATIONS

5.1 : Introduction

This chapter shows a summary of the most important results of the empirical analysis performed in Chapter Four. The research was on the impact of systems automation on tax governance in Uasin Gishu County, Kenya with special focus on the moderating effect of tax education in this relationship. In particular, the paper evaluated the impact of online process automation, transaction automation, and reconciliation and control automation on the outcomes in the field of tax governance, which is measured by the efficiency of revenue collection and tax compliance.

Based on the statistical findings and hypothesis testing, this chapter summarizes the significant findings in the context of every study objective and research question. The results are explained in respect of Digital Transformation Theory and Process Automation Theory, and the available empirical data on digital revenue administration and tax governance in devolved governments.

The chapter also gives the conclusions reached after the analysis and gives the practical suggestions to be made in fortifying the tax governance within the Uasin Gishu County. Specifically, the recommendations are aimed at improving the successful utilization of the Integrated Revenue Management Information System (IRMIS), as well as the enhancement of the process of reconciliation and control, and the maximization of the benefits of systems automation in governance. The chapter summarizes by pointing out policy, practice and future research implications in the context of the devolved governance structure in Kenya in terms of county-level revenue administration.

5.2 Summary of Findings

The study had a response rate of 90 per cent (181 out of 200 questionnaires) which showed a good participation and representativeness. The sample was almost equal in gender with 92 (50.8) female and 88 (48.6) male. Most respondents fell within the age group of 3645 years (30.9) and 4655 years (29.3), meaning that 60.2% of those who responded have been in the middle of their careers, or are too young (1825 years) or too old (56 years and above) to respond. In terms of education, the sample was very qualified with 42.5% of the sample having postgraduate degrees and 38.5% having undergraduate degrees implying that 81% of the sample had postgraduate degrees and

38.5% having undergraduate degrees. In role distribution (n=178), taxpayers made up 74.7 percent of the respondents; including traders/SMEs (31.5), wholesalers (23.0), distributors (20.2) and county revenue administration staff, such as finance and reconciliation officers (9.6) and systems administrators (7.9). The level of experience was high with 75.6 percent of those that replied having over four years of involvement in county revenue processes with the majority being drawn to the transactions-intensive revenue streams, which include Markets/Stalls (32.2%), Cess-Produce (25.6%), and Parking (22.8%), which accounted 80.6 percent of the valid responses. On the whole, the demographic profile shows that the sample is knowledgeable, experienced, and operationally engaged, which should be applicable to assessing the relationship between systems automation, tax education, and tax governance.

The research determined that automation of systems and education on tax are major factors in determining tax governance in the Uasin Gishu County. The correlation analysis showed positive and statistically significant relationships between the online process automation ($r = 0.405$, $p < 0.01$), transaction automation ($r = 0.354$, $p < 0.01$), reconciliation and control automation ($r = 0.649$, $p < 0.01$) and tax education ($r = 0.658$, $p < 0.01$) and tax governance, which implies that improvements in automated processes and education are associated with improvements in the outcomes of governance. The results of the regression indicated that the combined model would explain 54.1 percent of the variability in the governance outcomes ($R 2 = 0.541$, $F = 51.915$, $p < 0.001$), which reflects the combined effect of automation and education in influencing the outcomes in terms of governance.

In particular, the positive, statistically significant effect of automation of online processes on tax governance was observed ($B = 0.121$, $9 = 0.131$, $t = 2.336$, $p = 0.021$). This is in line with the recent discoveries by Muthuri, Maku, and Kambura (2025), who have established that the adoption of digital taxation systems is an effective way to increase tax compliance in small and medium enterprises (SMEs) (Muthuri *et al*., 2025).

Although the automation of transactions had a positive correlation with tax governance, it was not statistically significant in multivariate analysis ($B = 0.059$, $\beta = 0.063$, $t = 1.123$, $p = 0.263$). However, its positive relationship with the governance outcomes indicate its meaningful contributions in terms of operations. This is in line with the results of Tarus (2025), who discovered that automated tax systems (such as online payment and automated reporting) positively and

significantly correlate with overall tax compliance, even though the strength of any of its components may vary depending on context (Tarus, 2025).

Conversely, the critical nature of internal controls like automated reconciliation, audit trails and access control mechanisms in improving governance was demonstrated with a strong and significant effect (B = 0.320, 0.341 and t = 4.934, p = 0.001), which is significant. Reinforcing this, recent revenue administration literature highlights that strengthened internal control systems are key to improving transparency and reducing revenue leakages, demonstrating significant links between enhanced controls and improved revenue outcomes (Simon, 2025).

Tax education had the strongest impact, and was found to have a strong positive effect on tax governance (B = 0.350, 8 = 0.371, t = 5.456, p < 0.001). This implies that greater taxpayer knowledge, guidance and procedural literacy have a significant positive impact on the outcomes of governance. The discovery agrees with the larger body of empirical evidence demonstrating that tax education is a key determinant of tax compliance behaviors in terms of enhancing understanding of obligations and reducing errors, thereby increasing voluntary compliance (Akins, 2023; ResearchGate, 2026).

Altogether, the results of the study support the findings of recent research that digital tax system adoption and automation have a significant impact on compliance and governance, and that the education of taxpayers enhances these relationships. As an illustration, Muthuri *et al*. (2025) established that there is a strong positive relationship between adoption of digital platforms and SME tax compliance, whereas Akins (2023) concluded that tax education significantly predicts the level of compliance, and that structured awareness programs are crucial in improving the effectiveness of digital governance system.

5.3 Discussion of Findings

The purpose of this study was to examine the effect of systems automation on tax governance in Uasin Gishu County, Kenya, and to determine the moderating role of tax education in this relationship. The discussion interprets the findings in relation to the study objectives, Digital Transformation Theory, and existing empirical literature.

The findings established that online process automation had a positive and statistically significant effect on tax governance. This suggests that automating core revenue administration processes,

including taxpayer registration, assessment, licensing, and service delivery, enhances governance by improving operational efficiency, minimizing procedural delays, and reducing opportunities for discretionary decision-making. These findings are consistent with Digital Transformation Theory, which posits that digital technologies create organizational value by redesigning business processes and improving information flows rather than merely digitizing existing activities (Vial, 2021). The results further corroborate the findings of Muthuri et al. (2025), who reported that the adoption of digital tax administration systems significantly improves tax compliance among small and medium enterprises by simplifying compliance procedures and enhancing service accessibility. The findings therefore demonstrate that process automation contributes not only to administrative efficiency but also to greater transparency and accountability in county revenue administration.

The study further found that transaction automation exhibited a positive relationship with tax governance but did not exert a statistically significant influence after controlling for the other explanatory variables. This finding suggests that although electronic payment platforms, automated billing systems, and digital transaction processing improve operational convenience, their contribution to governance may depend on complementary institutional and technological factors. Digital Transformation Theory argues that isolated digital technologies rarely produce transformative organizational outcomes unless implemented within an integrated digital ecosystem (Verhoef et al., 2021). Consequently, transaction automation alone may not sufficiently strengthen governance where reconciliation procedures, internal controls, and user capabilities remain weak. This finding partially supports the observations of Tarus (2025), who found that automated tax payment systems improve compliance outcomes, although the magnitude of their contribution varies depending on institutional readiness and implementation quality.

Reconciliation and control automation emerged as one of the strongest predictors of tax governance, confirming the critical role of automated audit trails, electronic reconciliation, and system-based internal controls in strengthening transparency and accountability. These findings reinforce Digital Transformation Theory by demonstrating that the governance benefits of digital transformation extend beyond service automation to include mechanisms that enhance data integrity, financial oversight, and institutional accountability. Similar conclusions were reached by Simon (2025), who established that strengthened digital control systems significantly reduce revenue leakages and improve financial governance within public sector institutions. The findings

therefore suggest that county governments should prioritize investments in integrated reconciliation and control mechanisms alongside other automation initiatives to enhance public confidence in revenue administration.

The findings also established that tax education exerted the strongest positive influence on tax governance, highlighting the importance of taxpayer knowledge and awareness in achieving successful digital transformation. This finding suggests that technological innovation alone is insufficient to improve governance unless taxpayers possess the knowledge and confidence required to interact effectively with automated systems. Recent literature similarly demonstrates that taxpayer education improves voluntary compliance by increasing understanding of tax obligations, reducing procedural errors, and strengthening trust in revenue authorities (Akins, 2023). The findings therefore support the argument that tax education complements systems automation by enabling taxpayers to utilize digital platforms more effectively, thereby maximizing the governance benefits associated with digital revenue administration.

Overall, the findings demonstrate that effective tax governance is achieved through the combined influence of integrated systems automation and taxpayer education rather than through technological adoption alone. This conclusion strongly supports the propositions of Digital Transformation Theory, which emphasizes that organizational performance improves when digital technologies, institutional processes, and human capabilities operate in a coordinated manner. The findings further suggest that county governments should pursue comprehensive digital transformation strategies that combine process automation, transaction automation, reconciliation and control systems, and continuous taxpayer education to enhance transparency, accountability, efficiency, and voluntary tax compliance within devolved revenue administration.

5.4 : Conclusions

The research question was to establish the role of systems automation and tax education on tax governance in the county revenue system in the Uasin Gishu County, Kenya. The findings suggest that systems automation has a fundamental role in enabling the role of tax governance through enhanced transparency, operational efficiency, accountability and compliance monitoring of the county revenue system. In particular, the online registration, automated billing, electronic payment integration, reconciliation controls and audit trails are all digital workflow processes that contribute to having better governance performance by reducing the amount of manual

intervention, error rate, and traceability of revenue transactions. The results show that automation reforms provide a structural foundation of improved fiscal discipline and administrative control in devolved revenue systems.

The research also finds that automation of processes online augments governance by simplifying administration processes and by increasing access to tax services. Onboarding that is digital, automated notifications, and system-based approvals help minimize bureaucratic bottlenecks and increase procedural consistency. These results suggest that the workflow reforms that are driven by technology not only enhance efficiency but also build trust in revenue administration as it promotes predictable and transparent workflow.

On the subject of automation of transactions, the findings are that automated posting of payments, electronic receipting and integrated digital payment channels have some positive effects on the outcome of governance. Although the process of transaction automation in itself, may not be the most potent independent variable in governance performance, it is one of the significant operational drivers in the larger automation system. Proper transaction processing systems result in better accuracy, reduced delays in reconciliation and better data integrity, thus leading to better revenue monitoring mechanisms.

The study also concluded that matching, detecting discrepancies, role-based access controls and audit trail mechanisms are very significant in enhancing internal control systems and in minimizing the risk of revenue leakages. These mechanisms that strengthen governance promote financial accountability and make sure the revenue records are trustworthy to be used in reporting and making decisions. The results hence highlight the need to integrate high control characteristics in digital revenue systems to attain sustainable governance gains.

In addition, the research validates that tax education is a critical variable in enhancing tax governance by increasing taxpayer awareness, procedural knowledge and compliance behavior. Formed teaching, effective communication and availability of support channels boost voluntary conformity and improve the efficiency of digital systems. According to the results, technological reforms cannot work independently without the help of behavioural-support intervention strategies which could help taxpayers learn and effectively use automated environments.

Structural and behavioural determinants have an impact on tax governance in terms of county revenue administration. Computerization of the systems provides the technical infrastructures

required in the improvement of efficiency and control, and tax education enhances compliance behavior and trust within the institution. The combination of the processes of automation and the sensitization programs to the tax payers in such a way is a comprehensive solution to improving the performance of governance in devolved revenue systems. These findings indicate that combined reform strategies can be implemented to simultaneously improve the outcomes of tax governance by improving the digital infrastructure and enhancing internal controls and the taxpayer education programs.

5.5: Recommendations

Within the context of the results of the present study, it is recommended that the County Government of Uasin Gishu should work harder to automate its revenue administration systems by ensuring that the systems are more reliable, easy to use and integrate across the revenue streams. The focus of continuous system enhancements should be on minimizing down time, enhancing real time synchronization between payment systems and reconciliation systems and the strengthening of user-interface simplicity to the internal staff as well as the taxpayers. The amount of fragmentation will be reduced and the traceability of the revenue flows will be improved as more integration will be performed between the billing, payment, reconciliation and reporting modules. The county should also ensure that the reforms in automation are complemented by regular audits of the system and regular upgrades to allow the system to continue operating and maintain the integrity of data. These will enhance transparency, reduce revenue leakages and establish fiscal responsibility on the devolved revenue system.

The paper further recommends that reconciliation and control procedures in the automated revenue system needs to be reinforced as a strategic priority. The use of automated bank matching, discrepancy flagging, audit trails, and role-based access controls must be continuously improved to minimize the amount of unauthorized adjustments and to increase the level of internal accountability. The county government should formalize automated reconciliation timetables and implement strict scrutinizing policies to make sure that any abominations are detected on time. More so, the capacity-building programs of the revenue and finance officer must be oriented on: internal control compliance, and ethical system use. More rigorous governance and control automation will both promote higher standards in governance and guard the revenues of the population against systemic weaknesses.

The study further suggests the increase in the magnitude and the frequency of structured and continuous taxpayer sensitization programs on the county level. The county government, together with business associations and market leadership structures, must develop specific education programs that can guide the taxpayers on how they can digitally register, process bills, and undertake electronic payment procedures and ensure compliance measures. The simplification, localization, and delivery of education programs should be done through multiple avenues, which include physical workshops, digital media, and on-site demonstrations in key revenue collection points such as markets, cess stations and on-site demonstrations. The well-structured user guides and helpdesk support systems should also be reinforced to allow the taxpayers to navigate automated systems efficiently. Improving tax education will enhance voluntary compliance, and maximize the governance benefits of automation reforms.

It is also recommended by the study that a governance-based approach to automation should be employed, which combines technological reforms with behavioural and institutional strengthening measures. Automation plans are not to be realized as single technical upgrade but as a part of the overall agenda of governance reform that is expected to be more transparent, accountable, and trustworthy. This involves effective communication on how revenue collected will be used, periodic release of reports on revenue performance, and enhanced feedback systems that will enable the taxpayers to raise their concerns on how the revenue collected will be used, periodical release of revenue performance reports, and improved feedback systems. The county can enhance institutional legitimacy by ensuring that it reinforces openness and responsiveness and promotes a culture of cooperation and compliance.

Practically, the County Government of Uasin Gishu should consider the integrated revenue governance model that will incorporate the enhancement of digital infrastructure, effective internal control, systematic taxpayer education, and institutional means of transparency. Automation and education are two elements that cannot be independent of each other since the key to sustainable improvements in tax governance lies in the synergy between automation and education. The simultaneous strengthening of these elements will not only contribute to an increase in the efficiency of revenue collection and the level of compliance but will also create the basis of long-term trust and confidence in the taxpayer and ensure long-term sustainability in the fiscal management of the devolved system of governance.

5.6: Recommendations for Further Studies

Future studies can be limited to the scope of the study to more counties in Kenya. Such comparison of systems automation and tax education effects on the results of tax governance under different administrative capabilities, infrastructural statuses, and digital maturity levels would have been possible at a larger geographical area. Such comparative studies would be more informative on the role of technological infrastructure differences, staff capacity and revenue complexity in counties on the performance of governance. And likewise, the future research studies might have a longitudinal research design to test how the tax governance evolves over time, in particular, in response to the system upgrades, policy reforms, digital transformation initiatives, and various economic conditions of the devolved units.

To improve the future study, it is proposed that future researcher can take into account the mixed-method approach by integrating quantitative and qualitative research methods. To the extent that quantitative research methods that rely on surveys can provide measurable data with regard to the structural determinants of tax governance, a qualitative research methodology that can be used to establish deeper institutional, behavioural and organizational dynamics that influence the effectiveness of automation and compliance behaviour. These would help the researchers to analyze the perceptions of the revenue officers towards internal control systems, the perceptions of the taxpayers towards online platforms, and how institutional culture affects governance outcomes. A mixed-method design would thereby provide a more comprehensive perspective of the interplay between technology, education and performance of governance.

Moderating or mediating influences of other institutional and behavioural variables to the relationship between systems automation and tax governance should also be studied further. Variables that might influence the manner in which automation could be transformed into governance outcomes are trust in county revenue administration, enforcement intensity, organization culture, accountability mechanisms, and the level of digital literacy. Research into these areas could help to understand better the reasons behind the observed different outcomes of governance within counties or revenue streams due to the existence of similar automation systems. Moreover, a more detailed study of how such factors like the type of revenues, volume of transactions and the level of informality can affect the outcomes of governance would give a more detailed insight in the design of the specific digital governance reforms.

As the digitalization of the public finance systems is growing, future research ought to examine the effects of emerging technologies on the governance outcomes, such as artificial intelligence-based revenue analytics, blockchain-based transaction verification, mobile tax applications, and real-time dashboard reporting. Studies on such innovations may reveal how sophisticated digital tools can lead to enhanced transparency, minimize fraud risks, enhance predictive monitoring, and increase administrative efficiency in devolved revenue systems. These studies would help in evidence-based strategies of modernization in county governments.

Finally, comparative study among various administrative structures; national versus county revenue systems would provide greater perspective on how automation and education interrelate within the context of different administrative structures. Comparative studies across the East African Community would also provide some insight into best practices in digital revenue governance. In general, the future research must focus on technological, behavioural and institutional aspects of tax governance in order to support sustainable mobilization of revenues, strengthen fiscal accountability and improve performance of the public sector in Kenya and other developing economies.

REFERENCES

Addo, A. (2022). Information technology and public administration modernization in a developing country: Pursuing paperless clearance at Ghana customs. *Information Systems Journal*, *32*(4), 819–855. https://doi.org/10.1111/isj.12371

Blahušiaková, M. (2023). Business process automation – new challenges to increasing the efficiency and competitiveness of companies. *Strategic Management - International Journal of Strategic Management and Decision Support Systems in Strategic Management*, *28*(3). https://doi.org/10.5937/StraMan2300038B

Çıdık, M. S., & Boyd, D. (2022). Value implication of digital transformation: The impact of the commodification of information. *Construction Management and Economics*, *40*(11–12), 903–917. https://doi.org/10.1080/01446193.2022.2033287

Dörr, J. O., Licht, G., & Murmann, S. (2022). Small firms and the COVID-19 insolvency gap. *Small Business Economics*, *58*(2), 887–917. https://doi.org/10.1007/s11187-021-00514-4

Elumilade, O. O., Ogundeji, I. A., Achumie, G. O., Omokhoa, H. E., & Omowole, B. M. (2022). Optimizing corporate tax strategies and transfer pricing policies to improve financial efficiency and compliance. *Journal of Advance Multidisciplinary Research*, *1*(2), 28–38.

Estifanos, K. (2023). *The Effect of Digital revenue system on Revenue generation of AA Revenue Bureau with the system deployed by Ethiotelecom* [Thesis, ST. MARY'S UNIVERSITY]. http://repository.smuc.edu.et/handle/123456789/7556

Faybishenko, B., Versteeg, R., Pastorello, G., Dwivedi, D., Varadharajan, C., & Agarwal, D. (2022). Challenging problems of quality assurance and quality control (QA/QC) of meteorological time series data. *Stochastic Environmental Research and Risk Assessment*, *36*(4), 1049–1062. https://doi.org/10.1007/s00477-021-02106-w

Gallego de Cáceres, S. (2024). *A Quantitative Assessment of Total Factor Productivity and Tax Haven Use in Digital Firms* [Phd, Aston University]. https://publications.aston.ac.uk/id/eprint/47721/

Golubchikov, O., Pittini, A., Grimsley, C. K., & Lakatos, E. (2024). *Country profiles on urban development, housing and land management: Albania*. United Nations. https://doi.org/10.18356/9789213587935

Hesami, S., Jenkins, H., & Jenkins, G. P. (2024). Digital Transformation of Tax Administration and Compliance: A Systematic Literature Review on E-Invoicing and Prefilled Returns. *Digit. Gov.: Res. Pract.*, *5*(3), 18:1-18:20. https://doi.org/10.1145/3643687

Honorine, U. (2025). Examine the Impact of Using Digital Payment on Small and Medium Enterprises in Rwanda. *International Journal of Economics, Business and Accounting Research (IJEBAR)*, *9*(2). https://doi.org/10.29040/ijebar.v9i2.17096

Kamau, E. W. (2023). *Effects Of Revenue Collection Practices On County Government Financial Performance In Kenya* [Thesis, KCA University]. https://repository.kcau.ac.ke/handle/123456789/1542

Kirui, S. C., & Mose, T. (2024). INFORMATION COMMUNICATION TECHNOLOGIES AND PERFORMANCE OF REVENUE COLLECTION IN UASIN GISHU COUNTY, KENYA. *Journal of Applied Social Sciences in Business and Management*, *3*(2), 330–341.

Kroll, J. A. (2021). Outlining Traceability: A Principle for Operationalizing Accountability in Computing Systems. *Proceedings of the 2021 ACM Conference on Fairness, Accountability, and Transparency*, 758–771. https://doi.org/10.1145/3442188.3445937

Madunezim, C. J., Eze, C. C., & Oredu, J. N. (2023). Application of e-governance in service delivery: A study of Federal Inland Revenue Service. *Journal of Policy and Development Studies*, *14*(2), 104–111. https://doi.org/10.4314/jpds.v14i2.8

Nandan Prasad, A. (2024). Regulatory Compliance and Risk Management. In A. Nandan Prasad (Ed.), *Introduction to Data Governance for Machine Learning Systems: Fundamental Principles, Critical Practices, and Future Trends* (pp. 485–624). Apress. https://doi.org/10.1007/979-8-8688-1023-7_8

Ndukwe, O., & Allison, P. (2021). Good Governance and Ease of Doing Business in Nigeria: Problems and Prospects. *International Journal of Academic Management Science Research (IJAMSR)*, *5*(1), 88–96.

Nikidehaghani, M., Andrew, J., & Cortese, C. (2022). Algorithmic accountability: Robodebt and the making of welfare cheats. *Accounting, Auditing & Accountability Journal*, *36*(2), 677–711. https://doi.org/10.1108/AAAJ-02-2022-5666

Nour, S., & Arbussà, A. (2024). Driving innovation through organizational restructuring and integration of advanced digital technologies: A case study of a world-leading manufacturing company. *European Journal of Innovation Management*. https://doi.org/10.1108/EJIM-02-2024-0156

Okunogbe, O., & Santoro, F. (2023). Increasing Tax Collection in African Countries: The Role of Information Technology. *Journal of African Economies*, *32*(Supplement_1), i57–i83. https://doi.org/10.1093/jae/ejac036

Onwonga, G. (2024). *Role of County Own Source Revenue in the Provision and Management of Markets in Nairobi City County* [Thesis, University of Nairobi]. http://erepository.uonbi.ac.ke/handle/11295/165183

Otuke, W. (2023). *Role Of Automation Management Strategies On Revenue Growth Of Selected Lake Region Economic Bloc Counties In Kenya: Moderating Effect Of Political Influence* [Thesis, Kisii University]. http://localhost:8080/xmlui/handle/123456789/8310

Paroli, P. (2023). Optimizing Tax Apparatus Performance Management in Implementing a Modern Tax Administration System. *Atestasi : Jurnal Ilmiah Akuntansi*, *6*(2), 785–796. https://doi.org/10.57178/atestasi.v6i2.774

Putrevu, J., & Mertzanis, C. (2023). The adoption of digital payments in emerging economies: Challenges and policy responses. *Digital Policy, Regulation and Governance*, *26*(5), 476–500. https://doi.org/10.1108/DPRG-06-2023-0077

Quelhas Poças, M. (2025). Model for a Blockchain-Based National Digital Jurisdiction. In M. Quelhas Poças (Ed.), *Blockchain and Modern Governance: Frameworks for the Future of Societal Systems and Public Organizations* (pp. 113–147). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-85936-6_5

Rami, F. (2025). *Core Strategic Pillars of DevPay* (SSRN Scholarly Paper No. 5243122). Social Science Research Network. https://doi.org/10.2139/ssrn.5243122

Samardžić, D., & Velić, L. (2024). New ESG Obligations for Enterprises in Supply and Value Chains through Corporate Sustainability Due Diligence Acts in the EU and Germany. In E. Omerović, I. Kunda, Z. Meškić, & D. V. Popović (Eds.), *Balkan Yearbook of European and*

International Law 2023 (pp. 93–111). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-69670-1_5

Santoro, F., & Waiswa, R. (2024). How to improve tax compliance by wealthy individuals? Evidence from Uganda. *Development Policy Review*, *42*(2), e12754. https://doi.org/10.1111/dpr.12754

Schenk, B. (2025). IS Strategy and Governance. In B. Schenk (Ed.), *Advanced Management Information Systems: Models, Concepts and Cases* (pp. 89–140). Springer Nature Switzerland. https://doi.org/10.1007/978-3-031-87904-3_2

Shankar, V., Kalyanam, K., Setia, P., Golmohammadi, A., Tirunillai, S., Douglass, T., Hennessey, J., Bull, J. S., & Waddoups, R. (2021). How Technology is Changing Retail. *Journal of Retailing*, *97*(1), 13–27. https://doi.org/10.1016/j.jretai.2020.10.006

Sutam, E. D., Pei, F. L., Jia, J. T., Muhammad, N. A., Ab-Samat, H., Jeng, F. C., Prakash, J., Muhammad, N., & Sirivongpaisal, N. (2024). A Comparative Study on User Satisfaction from Manual to Online Information System using Define-Measure-Analyze-Improve-Control (DMAIC) in Service Administrative Process. *Journal of Advanced Research Design*, *122*(1), 27–45. https://doi.org/10.37934/ard.122.1.2745

Teyie, S. (2021). *Analysis of Charcoal Value Chain in Semi-arid Central Pokot Sub County, Kenya* [Thesis, University of Nairobi]. http://erepository.uonbi.ac.ke/handle/11295/160273

The Impact of Fintech on Banking and Finance: Use of Blockchain and Cryptocurrency – A Qualitative Multiple Case Study - ProQuest. (n.d.). Retrieved September 26, 2025, from https://www.proquest.com/openview/bea0850f4b7c977f1af5f6b7ad6b8613/1?pq-origsite=gscholar&cbl=18750&diss=y

Wachira, D. (2022). *Influence Of Internal Control Systems On The Financial Performance Of Classified Hotels In The Nairobi County* [Thesis, KCA University]. https://repository.kcau.ac.ke/handle/123456789/1355

Westland, J. C. (2022). Assessing Privacy and Security of Information Systems from Audit Data. *Information Systems Frontiers*, *24*(5), 1417–1434. https://doi.org/10.1007/s10796-021-10129-5

APPENDICES

APPENDIX I: QUESTIONNAIRE

Instructions: Please respond to the following questions as honestly as possible. Tick (✓) the option that best represents your opinion.

Section A: Background Information

1. **Gender:**

   ☐ Male ☐ Female

2. **Age:**

   ☐ 18–25 ☐ 26–35 ☐ 36–45 ☐ 46–55 ☐ 56 and above

3. **Education Level:**

   ☐ Primary ☐ Secondary ☐ Diploma ☐ Undergraduate ☐ Postgraduate

4. **Role / Category:**

   ☐ Revenue Officer

   ☐ Cash Office Staff

   ☐ Finance / Reconciliation Officer

   ☐ System Administrator

   ☐ Taxpayer – Trader/SME

   ☐ Taxpayer – Wholesaler

   ☐ Taxpayer – Distributor

   ☐ Other (specify) _____

5. **Years of Experience with County Revenue Processes:**

   ☐ Less than 1 year

   ☐ 1–3 years

   ☐ 4–6 years

   ☐ 7–10 years

   ☐ Over 10 years

6. **Workstation / Revenue Stream:**

☐ Business Permits

☐ Markets / Stalls

☐ Parking

☐ House Rent

☐ Cess / Produce

☐ Other (specify) _____

Section B: Online Process Automation (IV1)

This section looks at the effect of online process automation in efficiency and tax compliance in the Uasin Gishu County. It is concerned with internet registration, computerized assessment and billing, workflow approvals, notifications and validating data. Please indicate your agreement with each statement.

Scale:

5 = Strongly Agree 4 = Agree 3 = Neutral 2 = Disagree 1 = Strongly Disagree

No.	Statement	5	4	3	2	1
1	Revenue processes are quicker and more convenient through online registration and onboarding.	☐	☐	☐	☐	☐
2	Computerized evaluation and payment minimizes human mistakes and time wastage.	☐	☐	☐	☐	☐
3	System based approvals enhance speed and transparency of workflow.	☐	☐	☐	☐	☐

4	Automated reminders and notifications promote on time filing and payment.	☐	☐	☐	☐	☐
5	Online workflows enhance accuracy, record keeping and traceability of data.	☐	☐	☐	☐	☐

Do you believe Online Process Automation improves revenue collection efficiency and tax compliance?

☐ Yes ☐ No

Section C: Transaction Automation (IV2)

In this section, the respondents will be asked about their experience with regard to electronic payment and receipting processes within the county revenue system, including the issuance of verifiable digital receipts, real-time posting of payments, and automatic connection between payments and system records.

Scale: 5 = Strongly Agree … 1 = Strongly Disagree

No.	**Statement**	**5**	**4**	**3**	**2**	**1**
6	Payments in the county revenue system are transferred through integrated electronic systems (like mobile money or bank transfer).	☐	☐	☐	☐	☐
7	As soon as a payment is made, it will automatically be posted on the account of the taxpayer without manual processing..	☐	☐	☐	☐	☐
8	Electronic receipts are created as soon as the payment is made.	☐	☐	☐	☐	☐
9	The system issues electronic receipts that have unique identifiers that can be used to verify payment.	☐	☐	☐	☐	☐

10	Every electronic receipt is precisely matched to a certain payment done via the system.	☐	☐	☐	☐	☐

Do you believe transaction automation improves tax governance?

☐ Yes ☐ No

Section D: Reconciliation and Control Automation (IV3)

The section will capture the experiences of the respondents with regard to automated reconciliation and control systems in the county revenue system, including bank-system matching, exception handling, audit trails, and access controls that support accurate and accountable revenue records.

Scale: 5 = Strongly Agree … 1 = Strongly Disagree

No.	**Statement**	**5**	**4**	**3**	**2**	**1**
11	Any revenue received using the system will be automatically reconciled with bank records.	☐	☐	☐	☐	☐
12	The system identifies and flags payment or posting discrepancies without manual checking.	☐	☐	☐	☐	☐
13	Access to key revenue functions in the system is restricted based on assigned user roles.	☐	☐	☐	☐	☐
14	All revenue transactions and adjustments are recorded with clear audit trails.	☐	☐	☐	☐	☐
15	Corrections or reversals of revenue transactions require system authorization and leave a traceable record.	☐	☐	☐	☐	☐

Do you believe reconciliation and control automation improves tax governance?

☐ Yes ☐ No

Section E: Tax Education – MV

This section summarizes the perceptions of the respondents on the subject of tax education and its connection to the understanding and use of the automated revenue system of the county in relation to tax governance.

No.	Statement	5	4	3	2	1
16	I know that I have to pay my taxes according to the county revenue system.	☐	☐	☐	☐	☐
17	I know that I have to pay my taxes according to the county revenue system.	☐	☐	☐	☐	☐
18	The county has a clear information or guidance on how to use the digital revenue system.	☐	☐	☐	☐	☐
19	I am aware of where to turn to in case I have some problems with the taxation process or revenue system.	☐	☐	☐	☐	☐
20	The information that the county provides assists me to ensure that I adhere properly to tax requirement.	☐	☐	☐	☐	☐

Do you believe taxpayer education strengthens the effectiveness of system automation?

☐ Yes ☐ No

Section F: Tax Governance _DV

In this section, respondents express their perception on how taxes are governed in the county, in terms of efficiency in revenue collection and adherence to tax laws. The following statements are

Likert-scale statements that request the respondent to indicate the degree to which he agrees or disagrees with statements that describe the effectiveness, accuracy, timeliness, and consistency of revenue administration practices.

No.	Statement	5	4	3	2	1
16	The county measures the revenue, whereby the revenues are collected within reasonable periods.	☐	☐	☐	☐	☐
17	The tax payments by taxpayers are recorded correctly in the county revenue system.	☐	☐	☐	☐	☐
18	Any discrepancies between system records and financial accounts are addressed in a timely manner.	☐	☐	☐	☐	☐
19	Revenue books are credible in reporting and decision making.	☐	☐	☐	☐	☐
20	Majority of the taxpayers are able to pay their tax payment needs within the stipulated time limits.	☐	☐	☐	☐	☐
21	Taxpayers usually follow the steps that are established by the county revenue system.	☐	☐	☐	☐	☐
22	There are comparatively few cases of underpayment or late payment.	☐	☐	☐	☐	☐
23	Disputes or corrections related to tax payments are minimal.	☐	☐	☐	☐	☐

APPENDIX II: ESTIMATED RESEARCH BUDGET

No.	Item	Quantity	Unit Cost KES)	Total Cost (KES)
1	Publication / Literature	1	25,000	25,000
2	Airtime / Communication	4	2,500	10,000
3	Internet access	1	5,000	5,000
4	Stationery (pens)	20	150	3,000
5	Stationery (paper)	10	500	5,000
6	Travelling (field visits)	5	10,000	50,000
7	Lunch / Refreshments	20	800	16,000
8	Printing (questionnaires & report)	20	1,500	30,000
9	Data analysis software / tools	1	20,000	20,000
10	Contingency / Miscellaneous	1	10,000	10,000
	TOTAL COSTS			**174,000**

APPENDIX III: UNIVERSITY APPROVAL LETTER

AFRICA NAZARENE
UNIVERSITY

P.O.Box: 53067 – 00200
Nairobi, Kenya.
Tel: 020 252 7170/1 – 5
Email: vc@anu.ac.ke
www.anu.ac.ke

20th February, 2026

Dr. David Ngigi
Ag. Director General /CEO
National Commission for Science & Technology
And Innovation (NACOSTI)
Off Waiyaki Way, Upper Kabete
P. O. Box 30623 -00100
Nairobi, KENYA

Dear Sir,

RE: RESEARCH PERMIT: Michael Sikhanga (Student ID# 21s01dmgp013)

This is to confirm that Michael Sikhanga (Student ID# 21s01dmgp013) is a bona fide Master of Arts student at Africa Nazarene University (ANU), School of Humanities and Social Sciences (SHSS). He is pursuing Master of Arts in Governance, Peace and Security Studies, a program that entails both coursework and thesis.

Michael successfully completed his coursework and defended his thesis proposal entitled:

"System Automation, Tax Education and Tax Governance in Eldoret Town, Uasin Gishu County Kenya "

We kindly request that he be granted the necessary research permit to facilitate data collection and the successful completion of his thesis. Any assistance provided to him in this regard will be highly appreciated.

Faithfully,

Prof. Orpha K. Ongiti
Dean, Postgraduate Studies & Director, Institute of Research

APPENDIX IV: NACOSTI

REPUBLIC OF KENYA

NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Ref No: **609443**

Date of Issue: **05/March/2026**

RESEARCH LICENSE



This is to Certify that Mr.. MICHAEL BARASA SIKHANGA of Africa Nazarene University, has been licensed to conduct research as per the provision of the Science, Technology and Innovation Act, 2013 (Rev.2014) in Uasin-Gishu on the topic: SYSTEM AUTOMATION, TAX EDUCATION AND TAX GOVERNANCE IN ELDORET TOWN, UASIN GISHU COUNTY KENYA for the period ending : 05/March/2027.

License No: **NACOSTI/P/26/4185818**

609443

Applicant Identification Number

Ag. Director General
NATIONAL COMMISSION FOR SCIENCE,TECHNOLOGY & INNOVATION

Verification QR Code

NOTE: This is a computer generated License. To verify the authenticity of this document, Scan the QR Code using QR scanner application.

See overleaf for conditions

THE SCIENCE, TECHNOLOGY AND INNOVATION ACT, 2013 (Rev. 2014)
Legal Notice No. 108: The Science, Technology and Innovation (Research Licensing) Regulations, 2014

The National Commission for Science, Technology and Innovation, hereafter referred to as the Commission, was the established under the Science, Technology and Innovation Act 2013 (Revised 2014) herein after referred to as the Act. The objective of the Commission shall be to regulate and assure quality in the science, technology and innovation sector and advise the Government in matters related thereto.

CONDITIONS OF THE RESEARCH LICENSE

1. The License is granted subject to provisions of the Constitution of Kenya, the Science, Technology and Innovation Act, and other relevant laws, policies and regulations. Accordingly, the licensee shall adhere to such procedures, standards, code of ethics and guidelines as may be prescribed by regulations made under the Act, or prescribed by provisions of International treaties of which Kenya is a signatory to.
2. The research and its related activities as well as outcomes shall be beneficial to the country and shall not in any way;
    i. Endanger national security
    ii. Adversely affect the lives of Kenyans
    iii. Be in contravention of Kenya's international obligations including Biological Weapons Convention (BWC), Comprehensive Nuclear-Test-Ban Treaty Organization (CTBTO), Chemical, Biological, Radiological and Nuclear (CBRN).
    iv. Result in exploitation of intellectual property rights of communities in Kenya
    v. Adversely affect the environment
    vi. Adversely affect the rights of communities
    vii. Endanger public safety and national cohesion
    viii. Plagiarize someone else's work
3. The License is valid for the proposed research, location and specified period.
4. Neither the license nor any rights thereunder are transferable.
5. The Commission reserves the right to cancel the research at any time during the research period if in the opinion of the Commission the research is not implemented in conformity with the provisions of the Act or any other written law.
6. The Licensee shall inform the relevant County Director of Education, County Commissioner and County Governor before commencement of the research.
7. Excavation, filming, movement, and collection of specimens are subject to further necessary clearance from relevant Government Agencies.
8. The License does not give authority to transfer research materials.
9. The Commission may monitor and evaluate the licensed research project for the purpose of assessing and evaluating compliance with the conditions of the License.
10. The Licensee shall submit one hard copy, and upload a soft copy of their final report (thesis) onto a platform designated by the Commission within one year of completion of the research.
11. The Commission reserves the right to modify the conditions of the License including cancellation without prior notice.
12. Research, findings and information regarding research systems shall be stored or disseminated, utilized or applied in such a manner as may be prescribed by the Commission from time to time.
13. The Licensee shall disclose to the Commission, the relevant Institutional Scientific and Ethical Review Committee, and the relevant national agencies any inventions and discoveries that are of National strategic importance.
14. The Commission shall have powers to acquire from any person the right in, or to, any scientific innovation, invention or patent of strategic importance to the country.
15. Relevant Institutional Scientific and Ethical Review Committee shall monitor and evaluate the research periodically, and make a report of its findings to the Commission for necessary action.

National Commission for Science, Technology and
Innovation(NACOSTI),
Off Waiyaki Way, Upper Kabete,
P. O. Box 30623 - 00100 Nairobi, KENYA
Telephone: 020 4007000, 0713788787, 0735404245
E-mail: dg@nacosti.go.ke
Website: www.nacosti.go.ke

APPENDIX V: UASIN GISHU COUNTY

