Implementation of Government Policy on Science Education and Students' Academic Performance in science subjects in Secondary Schools, Nwoya District.

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September, 2026

Declaration

I, hereby, declare that this research dissertation, entitled *"Implementation of Government Policy on Science Education and Students' Academic Performance in science subjects in Secondary Schools, Nwoya District, Uganda*," is original work of mine, with the exception of passages where appropriate attribution has been made in the text and reference list. To the best of my knowledge and belief, it does not contain any work that has been published or written by someone else or that has been accepted for the award of any other degree from the university or other higher education institution.

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Approval

This is to certify the research dissertation titled *"Implementation of Government Policy on Science Education and Students' Academic Performance in science subjects in Secondary Schools Nwoya District, Uganda*" is written under our supervision and fits the specifications given by Gulu University. It is now ready for final submission to Directorate of Research and Graduate Training of Gulu University.

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Signature..... Date..5/10/2026.....

Ms. Pamela Peace Okwir

Dedication

I dedicate this research work to my beloved brother Odwarmoi Justine and his wife Aneno Grace for the foundation well laid for me in education achievements, my other brothers and sisters: the late Okot Alfred, Aldo Adwel, Odera Quinto, Nyeko Nicholas, Omona James Sunday, Atuk Vicky and Ajok Jibinina. I equally recognize the moral support rendered to me by my dear wife Amony Alice and my children Odera Elijah Noah, Lawino Bridget Noah, Oola Peter Noah, Ineko Judith Noah and Aluga Valeria Noah; Not forgetting my beloved dear mother Ms. Lawino Estherina.

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Abstract

This study investigated the Implementation of Government Policy on Science Education and Students' Academic Performance in science subjects in Secondary Schools in Nwoya District. The objectives of the study were to assess the status of implementation of government policy on science education in secondary schools, to establish the level of students' academic performance in science subjects in secondary schools and to establish the relationship between implementation of government policy on science education and the level of students' academic performance in science subjects in secondary schools in Nwoya District. Compulsory science at O' Level, science teachers' high pay, curriculum design change, teacher- training programme and SESEMAT denoted implementation of government policy on science education. MOCK grades, UNEB Grades (National Exams) and student's project grades denoted level of students' academic performance. The study was conducted using cross-sectional co-relational design; data were collected using questionnaires from 163 respondents. Descriptive statistics was used to analyse background statistics, objectives one and two. Pearson correlation was used to examine the relationship between implementation of government policies on science education and level of students' academic performance. The findings indicated that the implementation of government policy on science education in secondary schools were largely effective at the procedural and administrative levels. Teachers actively promoted science learning and provided support to learners, which demonstrates strong professional commitment and alignment with national education goals. The findings indicated a clear shift in respondents' understanding of academic performance from a narrow examination-oriented perspective to a broader, competency-based framework. Teachers strongly associated academic success with project-based learning, skill acquisition, and the practical application of knowledge. The findings revealed a moderate, positive and statistically significant relationship between the implementation of government science education policy and students' academic performance. The study concluded that implementation of government policy on science education was commendable in terms of policy awareness, curriculum adoption, teacher commitment, incentive structures and administrative supervision. The study concluded that the level of students' academic performance was widely perceived as multidimensional, extending beyond examination scores to include practical skills, critical thinking, creativity, collaboration and communication abilities. The findings concluded that there was a statistically significant moderate positive relationship between the implementation of government policy on science education and the level of students' academic performance in science subjects in secondary schools. The study recommended that government should prioritise equitable investment in laboratory infrastructure and provision of adequate science equipment across all secondary schools to ensure consistent and effective practical science instruction, secondary schools should institutionalise competency-based assessment approaches such as project-based learning and integration activities alongside UNEB examinations to ensure a more holistic evaluation of students' academic performance and the government and school administrators should adopt a holistic implementation strategy that strengthens science education policy while simultaneously addressing complementary factors such as resource provision, teacher capacity building and learner support systems to enhance students' academic performance.

Keywords: Implementation of Government Policy, Science Education and Students' Academic Performance.

Chapter One

Introduction

1.0 Overview

Globally, the essence of science education and the government policy on science education is rooted in fostering a scientifically literate population and promoting national development (OECD, 2017). Science education is essential for empowering individuals with critical thinking skills, problem-solving abilities and the knowledge required to understand and contribute to a technologically driven world (Burns, Köster and Fuster, 2016). Government policies are crafted to guide and enhance this process, ensuring that citizens are equipped with the scientific knowledge necessary for personal growth, economic progress and societal advancement (OECD, 2017). The government of the Republic of Uganda introduced the USE policy in 2007, aimed at providing free secondary education. This includes a focus on science subjects, ensuring that even students from disadvantaged backgrounds can access education, particularly in science, technology, engineering, and mathematics (STEM) as reported in OECD (2017). This study, therefore, examined the relationship between government policy on science education and level of students' academic performance in science subjects in secondary schools in Nwoya District.

This chapter discusses the background of the study, statement of the problem, purpose of the study, objectives, research questions, scope, significance and conceptual frame work of the study.

1.1 Background of the Study

This section presents the historical, theoretical, conceptual and contextual perspectives of the study.

1.1.1. Historical Perspective

Bichi, Fatima and Rahinatu (2019) reported that historically, academic performance has been a central concern of education systems worldwide. Since the spread of formal schooling during the industrial era of the 19th century, student performance has been tied to broader social, economic, and political goals such as nation-building, workforce preparation and social mobility. Global institutions like United Nations Educational, Scientific and Cultural Organization (UNESCO), United Nations International Children's Emergency Fund

(UNICEF) and the World Bank have emphasized the importance of improving student performance as a pathway to achieving sustainable development and poverty reduction (Jun, 2017). Over decades, research has increasingly focused on factors influencing performance, such as teaching methods, curriculum design, family background, socio-economic conditions and school environments (Bichi, Fatima and Rahinatu (2019).

In Africa, the discourse on student performance took on prominence particularly after independence in the 1960s, when education was seen as the key to modernisation and development (OECD, 2017). However, challenges such as limited infrastructure, inadequate teacher training, high pupil–teacher ratios, and political instability hindered consistent academic progress. By the 1980s and 1990s, structural adjustment programs and donor-driven reforms shifted focus towards efficiency and measurable outcomes, placing greater emphasis on exam performance in secondary schools (OECD, 2017). Research in countries like Nigeria, Kenya and South Africa has consistently highlighted those economic inequalities, cultural factors and governance structures strongly shape student achievement in secondary schools (Clive, 2017).

In Uganda, the concern for student performance can be traced back to the colonial education system, which privileged missionary and elite schools while leaving rural schools under-resourced (MoE&S, 2017). After independence in 1962, the government prioritized expanding access, but disparities in quality continued. The introduction of Universal Primary Education (UPE) in 1997 and Universal Secondary Education (USE) in 2007 significantly increased enrolments, but also raised questions about quality and performance due to overcrowding, teacher shortages and limited instructional materials (Byusa, Kampire and Mwesigye, 2020). National examinations (UCE and UACE) remain the primary measure of academic performance, often revealing stark inequalities between urban and rural schools, private and government schools, as well as between boys and girls (Byusa, Kampire and Mwesigye, 2020).

Diane (2023) asserted that science education gained prominence after World War II, particularly during the Cold War when the U.S. sought to compete with the Soviet Union in science and technology. The launch of Sputnik by the USSR in 1957 led to the National Defense Education Act (NDEA) of 1958, which promoted science, mathematics and engineering education. According to Diane (2023), the 1983 report *A Nation at Risk* highlighted declining academic standards, leading to increased emphasis on science education through

reforms like the No Child Left Behind Act (2001) and Every Student Succeeds Act (2015). Diane argues that U.S. education policy often fluctuates based on political concerns and noted that STEM initiatives are driven by economic competitiveness. Government policies have been linked to both improvements and criticisms in science education. Some authors suggest that while policies have increased resources, disparities in performance persist due to socio-economic factors and unequal distribution of resources (Diane, 2023).

The United Nations (2017) report critically examines the evolution of science education in Brazil, highlighting the impact of political, social, and economic factors. The report highlights the military dictatorship's centralized approach to education, limited access to quality science and technology education, and underdeveloped scientific literacy. After the military regime ended, Brazil began a process of democratization and educational reform, including the 1996 Law of Directives and Bases of National Education (LDB). However, the implementation of these policies was uneven across regions, exacerbating pre-existing educational inequalities. The Ciência sem Fronteiras (Science Without Borders) program, launched in 2011, aimed to internationalize Brazilian science and technology education, but critics argue it did little to address fundamental issues within the domestic science education system. The report also highlights that Brazilian students consistently underperform in international assessments, particularly the Programme for International Student Assessment (PISA).

The UK's science education policy has evolved significantly since World War II, driven by the need to enhance national competitiveness and meet the demands of a modern economy. Initiatives like STEMNET and curriculum reforms have aimed to broaden access and improve the quality of science education. However, despite these efforts, persistent inequalities between private and public schools continue to affect student performance and outcomes. Addressing these disparities remains a critical challenge for future policy developments, ensuring that all students have equal opportunities to excel in science education (John, 2016). The Robbins Report (1963) and subsequent policies emphasized expanding access to science and technology education in secondary schools (John, 2016). John (2016) reported that in the 21st century, there has been a push for STEM education through initiatives like STEMNET (1996) and curriculum reforms making science compulsory in early secondary education. John highlighted that UK policy shifts in science education have been driven by global economic competitiveness and national workforce needs. However, some scholars argue that despite

improvements in performance, inequalities persist between private and public schools, affecting student outcomes in science (John, 2016).

Zongyi and Gopinathan (2016) highlight that Singapore's emphasis on science and technology education began shortly after gaining independence in 1965, driven by the government's goal of positioning the country as a global knowledge hub. From the 1980s onward, a series of educational reforms placed science at the core of the national curriculum, supported by strong government policies. Key factors contributing to Singapore's success in science include Strong Government Support – continuous investment in education and a clear focus on science and technology as critical to national development, significant emphasis on teacher training and professional development ensures that educators are equipped to teach science effectively and the curriculum is challenging and designed to promote deep understanding of scientific concepts. As a result of these efforts, Singapore has consistently achieved high rankings in international assessments like TIMSS (Trends in International Mathematics and Science Study) and PISA (Programme for International Student Assessment). The focus on practical, inquiry-based learning which encourages critical thinking and hands-on exploration of scientific ideas has made Singapore's approach a model for other nations looking to improve their science education systems (Zongyi and Gopinathan, 2016).

According to Alexander and Pavel (2019), Russia under Soviet rule, science education was highly prioritised as a means of advancing national strength in areas like space exploration and military technology. Post-Soviet education reforms have aimed at maintaining Russia's strong emphasis on STEM, though with significant shifts towards more open, Western-style educational frameworks. Alexander and Pavel (2019) argued that despite post-Soviet economic challenges, Russia's historical focus on science education has maintained high student performance, particularly in mathematics and physics. However, issues like underfunding and outdated curricula in rural areas affect the overall performance (Alexander and Pavel, 2019).

Science education in China has seen several shifts, particularly during and after the Cultural Revolution (1966-1976), when the education system was disrupted. Since the 1980s, China has pursued aggressive education reforms aimed at catching up with global standards in science and technology (Jun Li, 2017). Hayhoe (2017) and Ministry of Education (2017) agreed to above report and noted that China's educational policies have been largely successful in producing top-performing students in international assessments. However, there is criticism

regarding the rote learning approach and the pressure on students, which some argue stifles creativity.

South Korea has undergone rapid educational transformation since the 1960s, with government policy heavily focused on science and technology to support industrialization. The emphasis on STEM education in secondary schools has been a driving factor in the country's economic success (Michael, 2015). Authors like Levent and Pehlivan (2017) and Michael (2015) noted that South Korea's high performance in science education is largely due to the government's consistent investment in teacher training, curriculum development and educational infrastructure. However, the intense pressure on students to perform has raised concerns about student well-being.

In many Sub-Saharan African countries, science education has historically been underfunded due to colonial legacies and post-independence economic challenges. However, policies in the 21st century have increasingly prioritized science and technology to foster development (Byusa, Kampire and Mwesigye, 2020). Authors like Clive Harber (2017) argue that despite policy initiatives, science education in Sub-Saharan Africa remains hampered by poor infrastructure, teacher shortages, and lack of resources. Performance in science is generally low, although efforts like the African Union's *STISA-2024* policy seek to improve science education across the region (Clive, 2017 and Mncube, 2015).

Uganda's government began to emphasise science education in secondary schools as part of its Universal Secondary Education (USE) policy in 2007 (MoE&S, 2006). Science subjects have been made compulsory in lower secondary education and the government has invested in infrastructure such as laboratories (UPSTU, 2023). UPSTU (2023) highlight that while government policy has increased access to science education, challenges remain in rural areas where resources are limited. The quality of science education and student performance varies widely between urban and rural schools, with national exam results showing lower performance in science subjects compared to other subjects.

1.1.2 Theoretical perspective

This study was informed by the Human Capital Theory (Becker, 1964). Human Capital Theory assumes that investment in education and training improves productivity and performance. Government policies on science education (teacher training, compulsory science subjects,

bursaries for science students) represent human capital investments. The theory supports linking such investments to expected improvements in student performance and national development. Furthermore, it posits that education is an investment that increases the productivity of individuals and societies. The more a government invests in education through policy, teacher incentives, and learning resources the higher the expected returns in terms of performance, innovation and economic growth.

In the Ugandan context, this theory strongly underpins the study of implementation of government policy on science education and student performance in that the Uganda Education White Paper (1992) and the National Curriculum Policy (2019) mandate science subjects (Physics, Chemistry, Biology and Mathematics) as compulsory at O' Level (S1–S4). Therefore, compelling all students to study sciences, government ensures a minimum level of scientific literacy, equipping learners with problem-solving skills and preparing a pool of future scientists, engineers, and health professionals. Human Capital Theory explains this as broad-based investment in the intellectual and productive capacity of the nation. Even those who do not proceed with science careers benefit from analytical and technical skills. In 2012 and reinforced in 2022, the Government of Uganda introduced salary enhancement for science teachers, paying them nearly double the salary of arts teachers (MoES, 2022). Incentivising science teachers, the state seeks to attract, motivate and retain talent in the sciences, thus improving the quality of teaching and learning. Human Capital Theory supports this, arguing that incentivizing key skills (like STEM teaching) leads to higher educational outcomes, which translate into greater national productivity. Well-implemented policies (compulsory sciences + better teacher pay) should yield better laboratory instruction, greater student engagement, and improved performance in national examinations (UNEB). However, if implementation gaps exist (e.g., inadequate laboratories, poor rural school resourcing), the expected return on investment in human capital may fall short.

Uganda Vision 2040 identifies STEM education as central to industrialization and technological advancement. Human Capital Theory provides the theoretical justification: investment in science education yields long-term economic benefits by creating a scientifically literate workforce to drive innovation, healthcare, and industrial growth. Human Capital Theory justifies the government's emphasis on science education policy by linking it directly to socio-economic development. It provides a framework to assess effectiveness: If science education policies are properly implemented, students' academic performance should improve, producing higher-quality human capital. It helps explain policy instruments like compulsory

science at O' Level and salary enhancement for science teachers as deliberate investments to increase returns in form of higher productivity and competitiveness. The theory was chosen over the other theories because it directly relates to the study variables as explained above.

1.1.3 Conceptual perspective

Conceptually, implementation of government policy on science education implementation is defined as the strategy of actions outlining how to effectively bring about change in science education (OECD, 2017). In the view of Young and Lewis (2015), implementation of government policy on science education implementation is a purposeful and multidirectional change process aiming to put a specific policy into practice and which may affect an education system on several levels. Meanwhile, Adeniran et al. (2023) defined implementation of government policy on science education as the product of the interaction among particular policies, people and places.

Borrowing from above authorities, this study conceptualises implementation of government policy on science education implementation as the process of developing teachers' training modules, curriculum design change and directing resource envelops towards sciences with set of programmes or activities and new structures to cause expected change.

According to Akinleke (2017), students' academic performance in science subjects involves meeting goals, achievements and objectives set in the study programme or course that a student attend expressed through grades which are the result of an assessment that involves passing or not certain tests, subjects or courses. On the other hand, Narad and Abdullah (2016) defined students' academic performance as the level of knowledge shown in an area or subject compared to the norm generally measured using the grade point average.

This study conceptualises students' academic performance in science subjects as the knowledge gained by the student which is assessed by Mock grades and UNEB grades for students to be achieved over a specific period of time. It is measured in terms of competency or skills gained and projects developed by learners.

1.1.4 Contextual Perspective

The Ugandan government has been promoting science education through policies like compulsory science subjects in secondary schools and prioritizing sciences in national exams

and scholarships. This policy is part of the broader aim to develop a STEM (Science, Technology, Engineering and Mathematics) workforce to drive economic growth and innovation (OECD, 2017). Nwoya District, located in northern Uganda, is a rural area with limited educational resources (UPSTU, 2023). Understanding the implementation of science education policies here highlights the challenges faced by rural schools in Uganda, such as inadequate infrastructure, lack of science equipment and teacher shortages. Rural schools often receive limited financial support to implement these policies effectively, which further exacerbates inequalities in academic performance. In many cases, rural schools with insufficient resources tend to report lower academic performance compared to urban areas (UPSTU, 2023). The study aligns with Uganda's Vision 2040 and its efforts to build a knowledge-based economy by enhancing STEM education. However, the study may critique how policy implementation is lagging behind in marginalised areas like Nwoya District, slowing progress toward these goals. In essence, the study investigates the gap between policy intention and practical outcomes, providing insights into how science education policies can be more effectively implemented to boost academic performance in under-resourced areas.

1.2 Statement of the Problem

Students' academic performance in science subjects is expected to be in good grades and high points obtained after siting for Uganda National Examinations Board set annually (UNEB, 2017). Despite the Ugandan government's efforts to improve science education through policies such as compulsory science subjects in secondary schools, the academic performance of students in science-related disciplines remains alarmingly low in rural districts like Nwoya (OECD, 2017). The government's policy emphasises the importance of science, technology, engineering and mathematics (STEM) education as a driver of national development and economic growth (UPSTU, 2023). However, in Nwoya District, secondary schools face significant challenges in implementing these policies effectively. These challenges include inadequate infrastructure, a shortage of qualified science teachers, insufficient laboratory equipment and limited financial resources. As a result, students' academic performance in science subjects continues to lag behind that of their counterparts in better-resourced urban areas, thereby widening the educational achievement gap (UPSTU, 2023). This study, therefore, investigated the implementation of government policy on science education in secondary schools in Nwoya District, focusing on how these implementation challenges affect students' academic performance. Understanding the disconnection between policy and practice

will provide insights into potential interventions to improve science education in rural areas and contribute to the achievement of national STEM education goals.

1.3 Purpose of the Study

The purpose of this study was to investigate the relationship between implementation of government policy on science education and students' academic performance in secondary schools in Nwoya District.

1.4 Objectives of the Study

(i) To assess the status of implementation of government policy on science education in secondary schools in Nwoya District.
(ii) To establish the level of students' academic performance in secondary schools in Nwoya District.
(iii) To establish the relationship between implementation of government policy on science education and the level of students' academic performance in secondary schools in Nwoya District.

1.5 Research Questions

(i) What is the status of implementation of government policy on science education in secondary schools in Nwoya District?
(ii) What is the level of students' academic performance in secondary schools in Nwoya District?
(iii) What is the relationship between implementation of government policy on science education and the level of students' academic performance in secondary schools in Nwoya District?

1.6 Scope of the Study

1.6.1. Content Scope

The study focused on the status of implementation of government policy on science education, level of students' academic performance in science subjects in secondary schools and relationship between implementation of government policy on science education and the level of students' academic performance in secondary schools in Nwoya District.

1.6.2. Geographical Scope.

Nwoya District comprised of two counties: Nwoya County and Nwoya East County. Moreso, Nwoya has three Town Councils: Koch Goma, Purongo and Anaka and eight Sub-Counties: Koch Goma, Lii, Anaka, Purongo, Got Apwoyo, Alero, Paminyai and Lungulu. Nwoya District is bordered by Omoro District from the East, Oyam District from the South-East, Pakwach District from the West and Amuru District from the North. This study involved ten secondary schools in Nwoya District.

1.6.3. Time Scope.

A study period was between 2019 -2024 and covered the period when government policy on science education became operational in the whole country Uganda. However, the year 2020 assessment was not done due the outbreak of Covid-19.

1.7 Significance of the Study

This current study endeavoured to establish the relevant to stakeholders who provided the critical insights into the gaps between policy formulation and implementation in rural settings like Nwoya District. Policymakers can gain a clearer understanding of the challenges secondary schools face in adhering to government science education mandates.

The study highlights areas where additional resources, including qualified teachers, laboratory infrastructure and teaching materials, are most needed. This may guide more targeted allocation of funds and support. The findings may help policymakers craft evidence-based reforms to strengthen science education, especially in marginalised regions, ensuring the policies are realistic and achievable across the country.

The study may offer head teachers insights into the specific challenges faced in implementing science education policies within their schools. This would help them develop strategies for better resource management, teacher support and curriculum implementation. With the study's findings, head teachers could advocate more effectively for additional government or donor support by presenting evidence of the barriers to effective policy implementation.

The study sheds light on the qualifications and training gaps among science teachers, encouraging efforts for professional development programmes and teacher training workshops.

Teachers may benefit from potential increases in resources and support based on the study's recommendations.

Addressing the implementation challenges of science education policies, the study has the potential to improve students' learning environments. This includes better access to laboratories, qualified teachers, and learning materials. The ultimate goal of the study was to improve students' academic performance in science subjects by addressing the factors that currently impede learning, such as teacher shortages and lack of infrastructure.

The investigation was hoped to contribute valuable knowledge to the field of educational policy implementation, particularly in rural settings and hoped to expand the literature on how government policies impact science education at the grassroots level. This study finding enhanced the investigator's understanding of the practical challenges of implementing educational policies, building expertise in education management and policy analysis.

Parents and local communities are availed with knowledge about the state of science education in their area and may be motivated to participate in advocating for better resources and support. For donors and development partners, the study provides clear data on where investments in science education could yield the greatest impact, encouraging targeted and effective support.

1.8 Conceptual Framework

Human Capital Theory (Becker, 1964) clearly portrays the interplay that takes place in organisations and it relevantly underpins this study as presented in *Figure 1*, below.

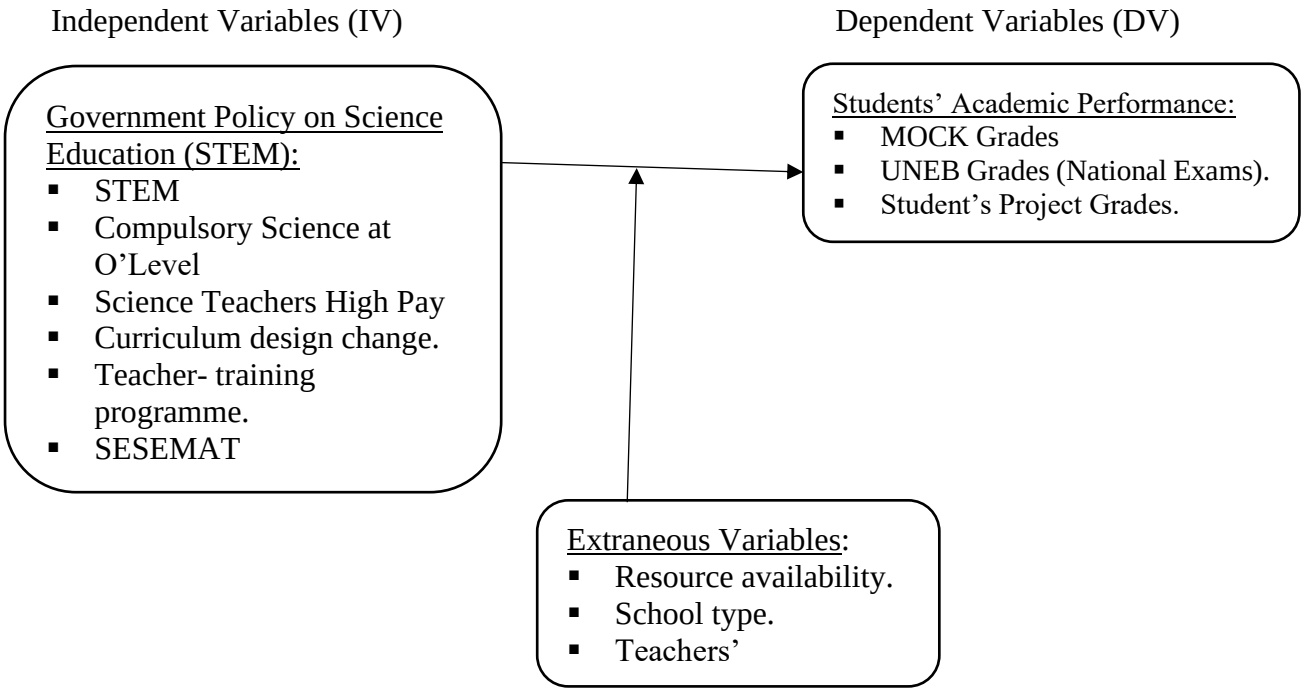


Figure 1: Conceptual Framework Showing the Relationship between Government Policy on Science Education and Level of Students' Academic Performance in Secondary Schools in Nwoya District

Source: Primary Data (2025).

The study found that there was relationship between implementation of government policy on science education and level of students' academic performance in secondary schools. Human Capital Theory postulates that the performance of students in science education is influenced by a combination of inputs; funding, curriculum design, teacher qualifications, processes; teaching methods, government reforms and outputs; student performance in assessments like national exams and international tests. Human Capital Theory assumes that government policy on science education (STEM policy) implementation such as high teacher pay, updated curriculum design and continuous teacher training, positively impacts students' performance in tests, projects and national exams. Conversely, weaknesses in any part of the system such as poor teacher training or inadequate resources can create negative feedback loops, lowering student achievement. Therefore, the system needs to function cohesively for optimal student performance in STEM disciplines.

Government STEM Policies like promotion of science education (compulsory science subjects), teacher training and capacity building, increased teacher pay for STEM subjects and curriculum design changes to align with 21st-century STEM, teacher quality and pedagogical approaches. A well-structured STEM policy becomes the foundation for academic growth, with positive wave effects throughout the system. Providing higher pay to STEM teachers, the government incentives qualified professionals to enter and remain in the teaching profession. This attracts and retains more experienced and highly skilled teachers. Therefore, higher pay improves teacher morale and reduces attrition, leading to more stable teaching environments and it allows teachers to invest more time in preparing students for success. On a similar note, motivated and well-paid teachers tend to deliver higher-quality instruction, enhancing students' understanding of complex STEM subjects, which is directly linked to better test grades and academic performance.

Students' performance in monthly tests, end-of-term grades and promotion grades improves due to consistent, high-quality instruction. Regular assessments provide insight into students' ongoing mastery of STEM subjects. They are affected by day-to-day teaching quality, which stems from well-designed curricula and teacher effectiveness. These reflect cumulative learning and are directly influenced by how well STEM policies are implemented, including resource availability and curriculum delivery. The system's cumulative output, these grades determine whether students advance to the next level, making them an essential indicator of how well the STEM policies are functioning. As high-stakes exams, UNEB grades reflect the system's overall effectiveness. Poor implementation of STEM policies (e.g., lack of resources, poorly trained teachers) will lead to lower scores, whereas effective implementation will result in higher national exam performance. Projects often reflect a student’s ability to apply learned knowledge in practical settings, a key component of STEM education. Successful projects indicate that the curriculum design and teacher instruction have adequately prepared students for real-world problem-solving.

Chapter two

Literature Review

2.0 Introduction

This chapter presented a review of related literature on implementation of government policy on science education and students' academic performance in secondary schools. The review mainly focused on the different government policies and how they influence the level of students' academic performance. Many studies were consulted for instance, recent journals, research reports, text books, official documents, among others based on this study objectives.

2.1 Status of Implementation of Government Policy on Science Education in Secondary Schools

According to Diane (2023), the implementation of government policy on science education in high schools varies significantly across regions, each adapting to its unique socio-economic, cultural and political context. The U.S. has heavily invested in STEM (Science, Technology, Engineering, and Mathematics) education over the past decades and national standards like the Next Generation Science Standards (NGSS) have been adopted by many states to enhance science literacy. The US policy emphasises inquiry-based learning, critical thinking and problem-solving and there is a growing focus on ensuring equity and closing gaps between high and low-income students. Findings above align to this study objective but it poses content and geographical gaps for this study to fill. Diane's study reported the general picture of government policy on science education in high schools in the US unlike this study which seeks to investigate and report on the case of secondary schools in Nwoya district which is predominantly rural. There is content gap in above study. This study, therefore, investigated implementation of government policy on science education in secondary schools in Nwoya District and report on in the year 2025.

Meanwhile, the UNESCO (2017) reported that Brazil's National Curriculum Guidelines for secondary education include mandatory science subjects. The emphasis has been placed on increasing technological competencies, particularly in public schools, as the country struggles with educational inequality. The UN asserted that in Brazil the progress of implementation of government policy on science education in high schools has been slow due to economic disparities and limited resources. STEM programmes are less widespread in public schools compared to private institutions, but there are government initiatives aimed at improving

infrastructure and teacher training. The findings relate to this study objective; however, it cannot be generalised to the case of Nwoya District as it lacks the data to do so. This study investigated and reported on implementation of government policy on science education and students' academic performance in secondary schools in Nwoya District in 2025 to bridge geographical gap.

The UK has a robust focus on STEM education, with science being a core part of the national curriculum and the government actively promotes science literacy, career pathways in STEM, and research (John, 2016). John (2016) reported that the UK has made significant strides, particularly in integrating real-world applications of science into the curriculum, however, there are regional differences in implementation between England, Scotland, Wales and Northern Ireland, with resource allocation being a key issue. Findings reported in the UK are relevant to this study objective as Uganda has a similar education system though it poses temporal and geographical gaps for this study to fill. Moreso, findings in the UK can't be generalised in Uganda as there is a big different in their economic status. This study filled the temporal and geographical gaps by investigating implementation of government policy on science education and students' academic performance in secondary schools in Nwoya District.

In the view of Alexander and Pavel (2019), Russia has a long tradition of strong emphasis on science and technology education, heavily supported by government policies aimed at maintaining the country's technological and scientific prowess. Alexander and Pavel argued that Russia has been quite successful in integrating advanced science education in secondary schools, especially in specialised science and technology-focused institutions. However, rural schools still lag behind in terms of resources and access. Thus this study sought to bridge the content and geographical gaps as nothing was mentioned about secondary schools in Nwoya District in the previous reports. The study investigated implementation of government policy on science education and students' academic performance in secondary schools in Nwoya District and report on in the year 2025.

Science education is a top priority in Singapore, which has consistently ranked among the top nations in international assessments like PISA and it is seen in the government's Teach Less, Learn More initiative which focuses on nurturing creativity and critical thinking in science education (Zongyi and Gopinathan, 2016). Zongyi and Gopinathan (2016) reported that Singapore's secondary schools have high-quality science education, with well-trained teachers and strong government support. There is widespread access to technology and

resources, and ongoing reforms aim to reduce student stress while maintaining high academic standards. This study investigated implementation of government policy on science education in secondary schools in Nwoya and reported on since nothing was mentioned about it from Zongyi and Gopinathan's findings in the year 2016 which is time and geographical gaps.

Jun Li (2017) revealed that the Chinese government has heavily invested in science and technology education as part of its long-term economic strategy and considers science as a key subject in the national curriculum, with an increasing focus on innovation and problem-solving. Urban schools' benefit from significant investment and are well-equipped for science education, but rural areas face disparities in terms of resources, facilities, and teacher training. The high-pressure exam system also influences the focus of science education (Hayhoe, 2017). Jun Li (2017) and Hayhoe (2017) used document analysis to report on the status of implementation of government policy on science education which is a methodological gap for this study to fill. Thus, this study investigated implementation of government policy on science education in secondary schools in Nwoya and report on in the year 2025.

Michael (2015) conducted a study on popular demand and education in South Korea and reported that South Korea's government has aggressively promoted STEM education, reflecting its strategy of innovation-driven economic growth. The national curriculum strongly emphasises science from an early age (Michael, 2015). South Korea has one of the highest levels of student achievement in science worldwide. There is extensive use of technology in classrooms, and the government continuously invests in upgrading teaching methodologies. However, the highly competitive academic environment can cause stress among students (Levent and Pehlivan, 2017). Findings above leave time and geographical gaps for this study to fill as it was reported on from South Korea in 2015 and overtime things could have changed. This study investigated the implementation of government policy on science education in secondary schools in Nwoya and report on in the year 2025.

According to UNESCO (2022), The Ministry of Education (MoE) commits to reform programmes that emphasize skills for work, inclusion, and alternative delivery (distance/digital learning). But Libya has lacked a unified national education sector plan since the post-2011 governance split, which complicates coherent science-education policy and resourcing. Core subjects (including Science) remain central in the basic/secondary curriculum; reforms since 2018 have focused first on core areas and on reintroducing structured teacher development. The MoE has used cascade models for rolling out new curricula and training fast, but often top-

down, with limited teacher co-design, which dampens classroom take-up. With fragmented governance, implementing lab-based science and continuous provision is uneven; distance-learning roadmaps exist (pilots, platform plans), but access gaps remain. European Training Foundation (ETF, 2020) reviews flag quality assurance and coordination problems in VET/upper-secondary pathways that should absorb science learners; these systemic issues spill into general secondary science. However, there still existed key constraints; political fragmentation, school disruption, supply chains for lab materials and weak, inconsistent teacher PD undermine fidelity of implementation even where policy signals are clear.

Yasmine (2021) reported that since 2018/19, Education 2.0 has been the national K-12 reform: competency-based, multidisciplinary learning with heavy digital integration, aiming to move beyond rote exams and expand STEM/skills across subjects in Egypt. New learner-centered, competency-based curricula rolled out grade-by-grade; inquiry-rich science and cross-disciplinary projects are a flagship element. Use of platforms (e.g., Egyptian Knowledge Bank), tablets, and e-assessment to support science learning and formative assessment in secondary and large-scale in-service training and new teacher cadres; ongoing monitoring by MoETE and development partners. Shift from high-stakes recall to more application-based assessment; transition is gradual, with mixed classroom uptake (Shawki, 2020). ETF/EU reviews and academic evaluations note momentum (curriculum, digital rollout) but also uneven implementation in schools (PD depth, infrastructure disparities, change-management for teachers and parents) as reported by Yasmine (2021). Yasmine's study left methodological gap for this study to fill as he used document review.

The Curriculum Framework for Primary and Secondary Education 2015–2022 repositioned secondary education around competencies, STEM/STEAM, entrepreneurship and Continuous Assessment Learning Activities (CALA) alongside ZIMSEC exams (Makamure and Jojo, 2023). Implementation began in phases from 2017. Science subjects are taught within a competence-based approach; CALA contributes ~30% of final grades in key secondary exit points, aiming to push practical/inquiry work (Makamure and Jojo, 2023). Government A-level STEM incentives (from 2016) and subsequent teacher-education pushes sought to expand science participation, especially for priority skills. Teacher's design/lead continuous assessment tasks in STEM areas, but require strong PD and resource backing for labs and projects. Studies consistently report resource constraints (labs, equipment, ICT), workload around CALA and uneven preparedness especially in rural schools limiting full, inquiry-based

science implementation despite policy alignment (Hardy, 2016). Contextual gap was noted from above study to be filled by this study in Nwoya.

Bichi, Fatima and Rahinatu (2019) revealed that science education policies across Sub-Saharan Africa focus on improving access, teacher training and curriculum development. Countries such as South Africa, Kenya and Nigeria have made progress in promoting science education, though resources are often limited. Despite improvements in policies, implementation remains uneven across the region. Urban schools tend to fare better than rural ones and there are challenges with infrastructure, teacher preparedness and learning materials. Governments and international organisations are working to bridge these gaps through various initiatives and partnerships. Findings by Bichi, Fatima and Rahinatu have not thoroughly explored or collected data on a specific topic and some variables related to status of implementation of government policy on science education have not been fully researched, thereby, creating empirical gap for this study to filled in Nwoya. This study investigated and filled the gap on status of implementation of government policies on science education in secondary schools in Nwoya and report on in 2025.

In Uganda, science education has been emphasized by government policy since the introduction of compulsory science subjects at the secondary level in 2005 and the goal is to develop human capital capable of contributing to national development (Amir. et al., 2016). UNEB (2017) report argued that despite the government policy on science education, Uganda faces significant challenges in terms of infrastructure, teacher shortages and access to materials, especially in rural areas. While efforts are being made to improve the situation, the quality of science education in many schools remains below global standards. Findings by UNEB (2017) align with this study objective, however, it requires further investigation to clarify patterns or causal relationships as time has gone by and UNEB's reports have methodological limitations, leading to a gap in robust, reliable data as UNEB relied on document analysis only. This study sought to bridge the gaps by investigating the status of implementation of government policies on science education in secondary schools in Nwoya and report on in 2025.

2.2 Level of Students' Academic Performance in Secondary Schools

The level of students' academic performance in secondary schools across the mentioned regions varies significantly due to differing educational systems, resource availability, and socio-economic factors (Moldes et al., 2019). The U.S. performs moderately on international assessments such as the Programme for International Student Assessment (PISA), particularly

in science and reading, but lags behind top-performing countries in math (Moldes et al., 2019). Moldes et al. (2019) reported that performance disparities exist between students from wealthy and low-income families, with gaps in access to quality education. Urban areas tend to perform better than rural ones. While top-performing students excel, a significant portion of students perform below grade level, especially in STEM subjects. Findings above resonate with this study objective but lack sufficient exploration within a context of secondary schools in Nwoya District and furthermore, the study used Educational Policy Implementation Theory as opposed to the System Theory which this study employed**.** Educational Policy Implementation Theory has not been thoroughly applied or tested in the context of Nwoya District circumstances. This study, therefore, sought to bridge contextual and theoretical gaps by investigating implementation of government policies on science education in secondary schools in Nwoya District and reported on in 2025.

According to Sirin and Rogers-Sirin (2015), Brazil generally ranks low on international assessments such as PISA, with many students struggling in math and science. Sirin and Rogers-Sirin argue that in Brazil, there is significant inequality in academic performance between urban and rural areas, as well as between public and private schools as lack of resources and teacher training further contribute to lower performance. Although the government is working to improve education, progress has been slow and large disparities persist. New technologies, societal shifts, or evolving contexts create a need for updated empirical data. Sirin and Rogers-Sirin reported their findings in Brazil way back in 2015 and overtime things could have changed. Furthermore, new technologies, societal shifts, or evolving contexts create a need for updated empirical data. This study investigated and reported the case of status of implementation of government policies on science education in secondary schools in Nwoya District in 2025.

Filippello et al. (2019) noted high level of students' academic performance in the UK. Filippello et al. argued that the UK performs well on international assessments like PISA, consistently scoring above the OECD average, especially in science and reading. OECD (2017) agreed to above finding and reported that regional variations exist, with some areas in England performing better than others (Scotland, Wales, Northern Ireland). Socio-economic factors affect performance, but the UK has been effective in maintaining relatively strong academic outcomes, however, overall students' academic performance remains steady, with ongoing reforms to maintain and improve academic standards, particularly in STEM. Findings in the

UK on this topic lacks investigation in the context of secondary schools in Nwoya District with different norms, values, or practices and there is little or no research on how certain phenomena affect various demographic groups, such as age, gender, ethnicity, or socioeconomic status. This study, therefore, was prompted by the identified gaps and conducted in secondary schools in Nwoya District and reported on in the year 2025.

Alexander and Pavel (2019) reported that Russia arguably performs above the global average in subjects like math and science, according to PISA and other assessments. While urban areas and specialised science schools do well, rural schools often underperform due to lack of resources. Russia excels in technical subjects, and its students tend to perform well in national exams. Russia continues to prioritize science and technology education, helping maintain strong performance in these areas (Alexander and Pavel, 2019). Alexander and Pavel reported the context of Russia which is a developed nation with different education system compared to Ugandan case which uses British education system and she is still underdeveloped. Findings in Russia can't be generalised in Uganda which is a geographical gap and lacks empirical data to back. This study filled the contextual gap and investigate implementation of government policies on science education in secondary schools in Nwoya District and report on in 2025.

Programme for International Student Assessment (PISA, 2022) reported that Singapore consistently ranks at the top in PISA and TIMSS (Trends in International Mathematics and Science Study), excelling in math, science, and reading. PISA (2022) revealed that in Singapore, *92%* of students attained at least Level 2 proficiency in mathematics, significantly more than on average across OECD countries (OECD average: *69%*). At a minimum, these students can interpret and recognize, without direct instructions, how a simple situation can be represented mathematically (e.g., comparing the total distance across two alternative routes, or converting prices into a different currency). Though the highly competitive academic environment can be stressful for students and there is a concern about the mental well-being of students due to the pressure to perform well and despite the challenges, Singapore remains a global leader in academic performance, with a strong emphasis on critical thinking and problem-solving. PISA findings align with this study objective as Uganda is one of the member countries but nothings specifically were mentioned about secondary school students' academic performance in Nwoya District which is a content gap for this study to fill. This study, therefore, investigated the case of Nwoya District and report on in the year 2025.

China, especially in cities like Shanghai and Beijing, consistently ranks highly in international assessments such as PISA, with particularly strong performance in math and science (Malekigorji et al., 2018). However, there are significant inequalities between urban and rural regions. While urban schools' benefit from better funding and produce high-achieving students, rural schools face challenges in accessing quality education. Although urban areas dominate global rankings, efforts are underway to bridge the rural-urban gap (Malekigorji et al., 2018). Historical changes and recent developments, such as advancements in technology or policy reforms, have not been thoroughly examined, and research findings are often not applied to specific sectors like healthcare, education, or business. These observations highlighted both contextual and content gaps, which this study addressed by exploring the impact of government policies on science education in secondary schools in Nwoya District.

Levent and Pehlivan (2017) noted that South Korea consistently ranks among the top nations globally in assessments such as PISA and TIMSS, particularly in math and science. They also highlighted that the country's highly competitive and exam-focused education system often results in high stress levels among students. Nevertheless, South Korea continues to maintain strong academic performance nationwide, with a growing discourse on the need to alleviate academic pressure. The findings, however, did not consider how natural, political, or economic factors might influence the implementation of government policies on science education, which may differ in Uganda's context. Therefore, this study examined the academic performance of secondary school students in Nwoya District and provide a report for the year 2025.

Addido et al. (2025) reported that in Egypt Thanaweya Amma is the national secondary school leaving examination and serves as the gateway to tertiary education. It significantly influences student learning and school practices. In recent years, national overall pass-rates have fluctuated significantly for example, it was around 81.5% in 2020, dropped to 74% in 2021, increased in other years from the low 70s to mid-80s (Addido et al., 2025). Addido et al., (2025) point to 'diploma disease', where teaching and learning strongly orient toward exam performance, rote learning and private tutoring culture. This affects classroom quality and equity and where exam pressure may distort educational goals. International assessment perspective: TIMSS 2019 data, only about 1% of Egyptian Grade 8 students reached high proficiency in science, with the majority in low-to-minimal proficiency categories. This points to underlying quality and conceptual understanding challenges in science education. Wiberg

and Rolfsman (2019) emphasized that home educational resources and parental education level strongly predict science achievement highlighting inequities among students in urban vs. rural or socioeconomic strata. While Thanaweya Amma pass rates may appear relatively strong overall (70–80% +), depth of scientific understanding and equitable access to quality science education remain concerns per the academic literature and assessment results (Addido et al., 2025). Above study left contextual gap for this study to fill. This study filled the contextual gap in Nwoya District.

Chimbunde (2023) reported that Ordinary Level (O-Level) and Advanced Level (A-Level) national examinations are administered by ZIMSEC. In some years, O-Level pass rates (for five or more subjects at Grade C or better) have been quite low, e.g., around 24–32% in recent periods (2019, 2020, 2023). In 2024, the O-Level national pass rate improved to approximately 33.2%, with school candidates performing slightly better than private candidates. Some high-performing schools show very high A-Level pass rates, sometimes 90%+, with certain mission or government schools achieving up to 97–98% in specific years. e.g., Mpopoma High School achieved ≈98.7% A-Level pass rate in 2016, outpacing national averages. National A-Level pass rates have also been high in some cycles, exceeding 90% in specific cohorts or schools. There is considerable variation between schools, with some satellite or under-resourced rural schools recording near-zero pass rates in some exam cycles. For instance, 33 secondary schools in one province recorded 0% pass rates at O-Level in a given year. Resource constraints, including poor infrastructure, rural–urban inequalities, teacher shortages, and economic pressures, are consistently cited by researchers and the media as root causes of low average performance. Some academic work has linked low examination registration rates, rural school conditions and socio-economic status to reduced quality of learner outcomes, including exam participation and pass probabilities (Chimbunde, 2023). Zimbabwe shows significant disparities while some elite or well-resourced secondary schools achieve very high A-Level pass rates, the national average O-Level pass rates remain modest (often <40%), with some rural/poorly resourced schools producing extremely low to zero pass rates (Chimbunde, 2023). Contextual and methodological gaps were noted from the study above. This study, therefore, is intended to fill those gaps.

In the view of James and Buhat-Mendoza (2020), Libya's students face significant challenges impacting their academic performance, including a weak educational policy environment, low-quality facilities, and issues with the curriculum's reliance on memorization and recall rather than critical thinking. While there has been an expansion in higher education,

this growth has exceeded the country's needs, highlighting shortcomings in the system's overall performance and operation. Secondary education structure which includes general, technical and vocational tracks and student pathway often determines whether a student is eligible for university or vocational training. Examination systems typically require pass thresholds to qualify for higher education. Academic performance context although detailed nationwide pass rates are not readily available, several studies and stakeholder reports note challenges with access to laboratory infrastructure, teacher quality and uneven resource distribution, which hinder science and overall secondary academic performance. Some qualitative studies and student accounts point to infrastructure decay, non-functioning labs, and under-qualified or absent teachers, leading to poor-quality instruction and limited deep learning in science and other subjects. Available literature suggests high variability and serious capacity constraints in secondary science performance in Libya, with likely low pass or competency rates in some areas, but no consistent national publicly available statistics found (James and Buhat-Mendoza, 2020). Contextual and methodological gaps were identified in the study by James and Buhat-Mendoza as they used qualitative approach. This study filled the contextual and methodological gaps above.

The academic performance of students in Sub-Saharan Africa is generally lower compared to global standards, with countries like South Africa, Kenya and Nigeria showing varying results. While some urban schools perform better, rural areas significantly lag behind (Bizimana, Mutangana and Mwesigye, 2022). This disparity is largely due to resource limitations, inadequate infrastructure, and a shortage of qualified teachers, particularly affecting subjects like science, math, and reading. Although governments and international organizations are striving to improve these outcomes, progress remains slow due to persistent systemic issues (Bizimana, Mutangana and Mwesigye, 2022). These findings lack practical insights into the implementation of government policies on science education in Ugandan secondary schools, where research has not been effectively applied to real-world practices. This gap exists due to disconnection between theoretical research and its application in everyday school settings or professions. Thus, this study investigated the implementation of government policies on science education in secondary schools in Nwoya District and report its findings in 2025.

In Uganda, student performance in secondary schools is generally low, particularly in STEM subjects, and the country faces challenges such as high dropout rates and limited

resources (Tumwebaze, 2016). Ejang (2024) reports that the academic performance of students in rural Ugandan secondary schools is relatively low, as reflected by a mean response indicating that students' performance in standardized science exams, including UCE and UACE, is not high. Additionally, her study found that the pass rate in rural secondary schools is low, with only *25%* of students achieving a second-grade result. Rural schools are especially affected by poor infrastructure, overcrowded classrooms, and a shortage of qualified teachers. Despite government efforts, such as mandating science education, progress has been slow, and national exam results show continued challenges. The findings from Tumwebaze and Ejang do not fully address how local, cultural, or environmental factors impact the practical implementation of strategies or technologies in these schools. This study investigated and reported on the government policies on science education in secondary schools in Nwoya district and report on in the year 2025.

2.3 Relationship between Implementation of Government Policy on Science Education and the Level of Students' Academic Performance in Secondary Schools

The U.S. has strong federal and state policies aimed at improving STEM education, including the Next Generation Science Standards (NGSS). However, education is largely decentralized, leading to variations in how policies are implemented and while top-performing schools in wealthier areas benefit from robust implementation of science education policies, underfunded schools in low-income areas struggle, leading to disparities in academic performance (Moldes et al., 2019). The effectiveness of policy implementation is closely tied to resource availability and equity. Strong policies do exist, but their uneven application affects performance across socio-economic lines (Moldes et al., 2019). Findings above resonate with this study objective but lack sufficient exploration within a context of secondary schools in Nwoya District and furthermore, the study used Educational Policy Implementation Theory as opposed to the Human Capital Theory which this study intends to employ**.** Educational Policy Implementation Theory has not been thoroughly applied or tested in the context of Nwoya District circumstances. This study, therefore, bridged the contextual and theoretical gaps by investigating relationship between implementation of government policies on science education and level of students' academic performance in secondary schools in Nwoya District and reported on in 2025.

Sirin and Rogers-Sirin (2015) reported positive correlation between implementation of government policies on science education and level of students' academic performance in high

schools in Brazil. Sirin and Rogers-Sirin (2015) asserted that Brazil has policies that emphasize science education, but the country faces significant challenges in terms of educational equity, teacher training and infrastructure. Student performance in science and other subjects is generally low, especially in public schools and rural areas. Inequality in resource distribution hinders the full implementation of science education policies. Inadequate policy implementation, due to resource constraints and educational inequalities, results in poor academic performance. The government's efforts to improve science education have not yet translated into widespread academic success. Sirin and Rogers-Sirin reported their findings in Brazil way back in 2015 and overtime things could have changed. Furthermore, new technologies, societal shifts, or evolving contexts create a need for updated empirical data. This study investigated and reported the case of relationship between implementation of government policies on science education and level of students' academic performance in secondary schools in Nwoya District in 2025.

According to Filippello et al. (2019), the UK has well-established science education policies, integrated into the national curriculum and there is a strong emphasis on STEM education and preparing students for scientific careers. UK students perform well in science and other subjects, largely due to the effective implementation of policies, though regional differences (e.g., between England and Scotland) exist. The successful implementation of government policies on science education correlates with generally high level of academic performance in the UK, although socio-economic and regional variations still impact outcomes. Findings in the UK on this topic lacks investigation in the context of secondary schools in Nwoya District with different norms, values, or practices and there is little or no research on how certain phenomena affect various demographic groups, such as age, gender, ethnicity, or socioeconomic status. This study, therefore, was prompted by the identified gaps to be conducted in secondary schools in Nwoya District and reported on in the year 2025.

Alexander and Pavel (2019) reported that effective government policy implementation, particularly in well-funded urban areas and specialized schools, contributes to strong academic performance. Russia's government prioritizes science and technology education, with strong emphasis on specialized institutions and rigorous curricula. Russia performs well in science and math internationally, especially in urban areas and specialized schools. However, rural areas face challenges due to less effective implementation, leading to lower performance. Findings in Russia can't be generalised in Uganda which is a geographical gap and lacks

empirical data to back. This study filled the geographical gap and investigated relationship between implementation of government policies on science education and level of students' academic performance in secondary schools in Nwoya District and reported on in 2025.

In the view of PISA (2022), there is strong correlation between implementation of government policies on science education and level of students' academic performance in Singapore. Singapore's government has a highly focused approach to science education, with continuous reforms aimed at maintaining its competitive edge in global education rankings. Science education is deeply integrated into the curriculum. Singapore consistently ranks at the top of global assessments such as PISA and TIMSS, demonstrating strong student performance in science, math, and reading. The effective and comprehensive implementation of science education policies is directly related to Singapore's top-tier academic performance. Strong government support, high-quality teacher training and a focus on inquiry-based learning contribute to these outcomes. PISA findings align with this study objective as Uganda is one of the member countries but nothings specifically were mentioned about secondary school students' academic performance in Nwoya District which is a content gap for this study to fill. This study, investigated on the case of Nwoya District and reported on in the year 2025.

Jun Li (2017) in the study on Educational Policy Development in China for the 21st Century: Rationality and Challenges in a Globalising Age reported that there is a positive relationship between implementation of government policies on science education and level of students' academic performance in high schools. Jun Li revealed that China has placed significant emphasis on science and technology education, especially in urban areas where the government has invested heavily in infrastructure and teacher training. Chinese students, particularly in urban areas like Shanghai and Beijing, perform at a very high level in international assessments. In regions where policies are effectively implemented, such as major urban centers, academic performance in science is exceptional. However, rural areas, where policy implementation is weaker, lag behind, highlighting a disparity linked to uneven policy execution. Although, Jun Li reported positively strong correlations between these variables, his study was mainly qualitative in nature while this study will be quantitative. This study filled the methodological gap identified above.

Mufanechiya & Mokhele (2024) investigate the implementation of the Science Teaching Education Programme (STEP) in Zimbabwean secondary schools, focusing on whether government policy intent around expanding STEM education is being realized at

school level. Their data collection includes focus group discussions with student-teachers, in-depth interviews with STEM lecturers, and on-site observations of infrastructure. The study uses a phenomenological framework, i.e., they explore lived experiences and perceptions of those directly involved. Their key findings were that the government, through STEP, aimed to enhance access to STEM education, presumably by building teacher capacity, increasing the number of qualified STEM lecturers/teachers, and improving infrastructure. However, the authors found significant resource constraints, including inadequate infrastructure (e.g., labs, equipment) and lecturer turnover all of which threaten successful implementation. In other words, the policy design and ambition were not matched by on-the-ground capacity (both material and human). On-site observations revealed that many secondary schools lack robust laboratory infrastructure and equipment necessary for hands-on science education. However, instability in teaching staff) further undermines continuity and quality of STEM teaching. This combination of lack of labs, equipment, experienced / trained staff creates a weak implementation environment (Gadzirayi et al., 2016). The stepwise logic, as argued by the authors, is that without these conditions in place, STEM policy rollout is unlikely to translate into improved science learning outcomes. Mufanechiya & Mokhele articulate that improving student performance in O-Level science subjects (i.e., national secondary-school-level examinations) occurs only where certain conditions are met like availability of resources including specialist laboratories, up-to-date teaching materials, etc. Teacher preparation and capacity, i.e., well-trained teachers, continuity in staffing and presumably ongoing professional development. School support, which could include administration backing, mentorship programmes and context-specific adaptation of the curriculum and pedagogical methods (Gadzirayi et al., 2016). Content gap was identified from above study which prompted this study.

The MoE (2019/2020) documents show that Kenya's effort to strengthen science education has spanned more than two decades through initiatives like SMASE in-service training for teachers and the shift to the Competency-Based Curriculum (CBC). These policy steps have produced pockets of improvement, particularly where schools received well-trained teachers and adequate materials, reflecting progress in learner engagement and practical work. However, the same reports caution that system-wide improvements remain limited because many secondary schools lack science laboratories, equipment and consumable materials. Additionally, a significant proportion of teachers are not fully prepared for learner-centred pedagogies emphasized in CBC, limiting the intended impact of reforms. The Kenya National

Examinations Council (KNEC) results continue to reveal modest performance in Biology, Chemistry, and Physics at KCSE, with recurring concerns about syllabus overload, weak mastery of practical work and ineffective teaching approaches. Thus, the link between science policy implementation and student performance is not direct it is mediated by resource availability, teacher capacity and quality of pedagogy. Contextual gap was identified from above study as no data was available to generalise it to Nwoya District.

Habiyaremye et al. (2019–2020) highlight that the introduction of the Competency-Based Curriculum (CBC) in 2015/2016 marked Rwanda's effort to strengthen STEM education and align teaching with learner-centered methods. However, early empirical evidence showed low or mixed outcomes in science subjects. For instance, in one 2018 O-level district sample, nearly half (49%) of students failed Biology, indicating that reforms had not yet translated into improved achievement across the board. The studies also observed performance disparities by school type (urban vs. rural), location, and gender, with urban and better-resourced schools generally performing better than rural counterparts. In physics classrooms, researchers found partial reform uptake while some teachers adopted CBC principles such as group discussions and practical demonstrations, many still relied on traditional rote-learning approaches. These weaknesses were linked to inadequate laboratories, lack of teaching aids, and insufficient teacher preparation. At the system level, national statistics pointed to wider progression and retention challenges students dropping out or repeating classes which further suppressed performance indicators. Overall, both Habiyaremye et al. and Uwitonze & Nizeyimana (2021) converge on the idea that policy reforms alone are insufficient. The CBC improves outcomes only in schools where materials, trained teachers and consistent institutional support are present. In many classrooms, the uptake of learner-centred science and practical work remains variable, leading to uneven performance gains across regions and school types. Studies above had methodological gap for this study to fill as their studies were qualitative and this study adapted quantitative approach.

Levent and Pehlivan (2017) in their study on government education policies in high schools in South Korea indicated a positive association between implementation of government policies on science education and level of students' academic performance. According to Levent and Pehlivan South Korea's government has a strong focus on STEM education, with well-developed policies and high expectations for students. South Korea consistently ranks among the top performers globally, particularly in science and math. The close alignment between government policy and educational outcomes results in high academic performance.

The rigorous implementation of science education policies and investment in technology and teacher training has produced excellent results (Levent and Pehlivan, 2017). However, the above findings were from another country in the year 2017 not in Nwoya district, providing the opportunity for this study to investigate and report on as well in secondary schools in Nwoya district as geographical and time gaps noted.

According to Bizimana, Mutangana and Mwesigye (2022) in their study on performance analysis of biology education under the implementation of lower secondary school biology- competence-based curriculum: Policy implications reported a positive association between implementation of government policies on science education and level of students' academic performance. In the view of OECD (2017), Sub-Saharan Africa's science education policies vary by country, but most face significant challenges in terms of resources, teacher training, and infrastructure. Overall, academic performance in science is low, with many students struggling due to a lack of resources, inadequate teacher preparation, and poorly implemented policies. Inconsistent and often underfunded implementation of science education policies results in low student performance. While some countries (e.g., South Africa, Kenya) have made strides, the overall lack of effective policy implementation limits academic achievement. The above studies conducted by Bizimana, Mutangana and Mwesigye (2017) was done in a different country and OECD (2017) was reported quiet long ago and overtime things could have changed which was an opportunity for this study to be conducted and reported on from secondary schools in Nwoya District.

Ejang (2024) reported negative association between implementation of government policies on science education and level of students' academic performance in rural schools in Uganda. Ejang argued that Uganda's government has mandated compulsory science subjects in secondary schools, but the implementation is hampered by limited resources, infrastructure and teacher training, particularly in rural areas. Student performance in science remains low, especially in rural areas, despite the government's policy focus on improving science education. There is a clear gap between policy intent and actual performance, largely due to ineffective implementation. While the policy mandates science education, lack of resources and qualified teachers impedes its success. The findings from Ejang do not fully address how local, cultural, or environmental factors impact the practical implementation of strategies or technologies in these schools. This study investigated the relationship between government policies on science education and level of students' academic performance in secondary schools in Nwoya district and reported on in the year 2025.

2.4 Conclusion

Literature reviewed (Diane, 2023; The United Nations, 2017; John, 2016; Zongyi and Gopinathan, 2016) Singapore, Alexander and Pavel, 2019); Jun Li, 2017; Hayhoe, 2017; Michael, 2015; Levent and Pehlivan, 2017) showed that developed nations like the USA, UK, Singapore, South Korea and China have made substantial investments in science education and are globally recognised for their achievements. Meanwhile, developing nations like Brazil and Sub-Saharan Africa, including Uganda, face implementation challenges due to limited resources, teacher shortages and infrastructural issues, but efforts are ongoing to improve science education outcomes (Byusa, Kampire and Mwesigye, 2020; Clive Harber, 2017; Clive and Mncube, 2015 and UPSTU, 2023).

Countries like Singapore, South Korea and certain urban regions in China consistently rank among the highest in academic performance. Moderate Performers: The USA, UK and Russia perform reasonably well but face internal disparities due to socio-economic factors and regional differences. Low Performers: Brazil, Sub-Saharan Africa, and Uganda face significant challenges with student performance, particularly due to resource constraints, inequality, and infrastructural gaps, though efforts to improve are underway.

The literature reviewed showed that countries like Singapore, South Korea and urban centers in China that effectively implement well-designed government policies tend to perform exceptionally well in science education. Meanwhile, in countries like the USA and UK where resources are more available, academic performance is relatively high, although disparities exist. In Brazil, Sub-Saharan Africa and Uganda, lack of resources hinders the full implementation of policies, negatively impacting student performance. In countries with significant rural-urban divides (e.g., China, Russia, Brazil, Uganda), even well-designed science education policies struggle to lift academic performance uniformly. Urban students often benefit more from policies than their rural counterparts. In countries like Russia and South Korea, where teacher training and infrastructure are prioritized as part of science education policies, student outcomes are generally stronger. Conversely, in regions where teacher shortages and inadequate facilities are common (e.g., Sub-Saharan Africa, Uganda), performance suffers. Generally, the degree of alignment between the implementation of government science education policies and student performance is closely linked to resource availability, the quality of teacher training, infrastructure and the equity of policy execution.

2.5 Research Gaps

Empirical and structural gaps. Literature reviewed showed that developed nations like the USA, UK, Singapore, South Korea and China have made substantial investments in science education and are globally recognised for their achievements. Meanwhile, developing nations like Brazil and Sub-Saharan Africa, including Uganda, face implementation challenges due to limited resources, teacher shortages and infrastructural issues, but efforts are ongoing to improve science education outcomes (Diane, 2023; The United Nations, 2017; John, 2016; Zongyi and Gopinathan, 2016) Singapore, Alexander and Pavel, 2019); Jun Li, 2017; Hayhoe, 2017; Michael, 2015; Levent and Pehlivan, 2017)

Contextual gap. Singapore, South Korea and certain urban regions in China consistently rank among the highest in academic performance. Moderate Performers: The USA, UK and Russia perform reasonably well but face internal disparities due to socio-economic factors and regional differences (Moldes et al., 2019, Sirin and Rogers-Sirin, 2015, Filippello et al., 2019 and OECD, 2017).

Methodological gap. Most studies were conducted using either qualitative or mixed methods. (Moldes et al. (2019), Sirin and Rogers-Sirin (2015), Filippello et al. (2019) and Alexander and Pavel, 2019). Countries like the USA and UK where resources are more available, academic performance is relatively high. In Brazil, Sub-Saharan Africa and Uganda, lack of resources hinders the full implementation of policies, negatively impacting student performance.

Chapter Three

Methodology

3.0 Introduction

This chapter discussed the research methodology that were adopted in the study, specifically research approach, design, target population, sample population, sampling techniques, data collection techniques, data collection instruments, administration procedures, ethical considerations, data analysis techniques, quality control, assumptions, limitations and delimitations.

3.1 Research Orientation

This study used quantitative approach. Quantitative data collected using survey and that enables possible descriptive analysis of the identified numerical patterns in the data (Creswell, 2014). Quantitative approach was preferred over others as it was appropriate for the collection of data from an educated-large number of respondents.

3.2 Research Design

This study used co-relational design where data were collected from varied category at the same time (Creswell, 2014). This research design was considered appropriate as it described the existence of the phenomena based on empirical data. This allowed the researcher to establish the relationships that exist between two or more variables. This was suitable for this study because this research investigated the relationships that exist between implementation of government policies on science education and level of students' academic performance in secondary schools in Nwoya District.

3.3 Target Population

The study population comprised of the respondents who were capable of providing the needed information about the effects of implementation of government policies on science education on level of students' academic performance. The respondents considered, therefore, all the District Education Officer (DEO) - 01 as the head of education department in the district, District Inspector of Schools (DIS) -01 is in the selection lot because most time he or she goes to inspect how the schools are managed directly from the field and writes report on the status of all the schools within the district, head teachers - (12) are managers and accounting officers of schools. The teaching staff- 247 were selected because they are the implementers of all the

teaching and learning activities and beneficiaries of the study subject in all the 12 secondary schools in Nwoya District.

3.4 Sample Size

A total sample of 163 respondents: 01 District Education Officer (DEO), 01 District Inspector of Schools (DIS), 10 head teachers and 151 teaching staff in the identified secondary schools for the study. Head teachers are endowed with responsibility of managing schools and entire school activities thus, are enriched with information and data about the subject areas, Teachers are the implementers of all the teaching and learning activities which is the concern of this study. DIS and DEO are government officers charged with inspecting, reporting every schools and management of all teaching-learning activities in the district. The sample size was determined using Krejcie and Morgan (1970) sample size determination.

Table 3.1: Sampling Frame

Category of respondents	Total population	Sample size	Sampling procedures
DEO	01	01	Purposive sampling
DIS	01	01	Purposive sampling
Head teachers	12	10	Purposive sampling
Teachers	247	151	Simple random sampling
Total	261	163	

Source: (Report from Nwoya District Education Office, 2024)

3.5 Sampling Procedure

This study used both probability and non-probability sampling technique. Probability sampling techniques included simple random sampling. Probability sampling is where all items of the universe has an equal chance of inclusion in the sample as described by Creswell and Plano-Clark (2018). Purposive sampling technique was used to sample the respondents who were knowledgeable about the subject matter in secondary schools.

3.6 Data Collection Method

The research data were collected using; questionnaire survey and interviews to collect the data.

3.6.1 Questionnaire Survey

The study used questionnaire surveys for teachers and was considered appropriate because of its efficiency for a large sample that other techniques may not be able to cover effectively, it is

also appropriate for literate population (Creswell and Clark-Plano, 2018). Creswell and Clark-Plano (2018) argued that, questionnaire surveys help in achieving uniformity, stability and consistency in facts and information.

3.7 Data Collection Instruments

3.7.1 Questionnaires. Questionnaires with closed ended questions divided in to three sections, i.e., section A on background information that require respondents to tick the most appropriate item that relates to them, section B on implementation of government policies on science education that require respondents to tick the most appropriate level of their agreement or disagreement with the statements using five points Likert Scale. Section C was on level of students' academic performance. Questionnaires were administered on teachers to collect primary data for the study and administered by the researcher to the respective respondents to obtain immediate feedback.

3.8 Quality Control

3.8.1Validity.

Content validity was used to ensure validity of the study. Alternatively, through judgment of the items by experts (Mugenda and Mugenda, 2003). The content validity index for each item in the instrument was computed using the content validity formula as seen below;

$$\text{The CVI} = \frac{\text{Number of items rated relevant by all judges}}{\text{Total number of items in the instrument.}}$$

For this study, therefore, if the CVI is 0.07 and above, the instrument was considered valid (Mugenda and Mugenda, 2003).

3.8.2 Reliability.

To establish reliability, Cronbach Alpha Coefficient formulae $\alpha_1 = 1 - [6\sum D^2 / n\,(n^2 - 1)]$, if the alpha value results computed is 0.07 and above, the instruments was considered as valid and consistent but if the value is less than 0.7 then the process was repeated until the required value was obtained (Mugenda and Mugenda, 2003).

3.9 Administration Procedures

Having ascertained the suitability of the instruments, I shall obtain permission to conduct research from Faculty of Education and Humanities, Gulu University, where an introductory

letter was issued to introduce the researcher to the authorities of the selected schools. The researcher made pre-field visits to all the schools and made appointments for data collection.

3.10 Data Analysis

The data were collected, sorted and coded by use of Statistical Package for the Social Sciences statistical (SPSS version 26.0). This was preferred because it covers many tests of statistical analyses, filters and prepares data for an analysis, builds different charts, performs testing for two and more sample hypotheses, analyses relationships between two and more variables, classifies data and creates clusters (Coakes, 2008). Descriptive statistics was used to analyse background statistics and objectives one and two. Pearson Correlation was used to analyse the data in objective three; the relationship between implementation of government policies on science education and level of students' performance. Pearson correlation was used to examine the relationship between implementation of government policies on science education (an independent variable) and level of students' academic performance (the dependent variable).

3.11 Ethical Considerations

The researcher considered the research values of voluntary participation, anonymity and protection of respondents from any possible harm that could arise from participating in the study. The researcher introduced the purpose of the study as a fulfillment of a Masters' study programme by the researcher and request the respondents to participate in the study on a voluntary basis and declining to participate in the study were permitted. The researcher assured the respondents of confidentiality of the information given for the study since the findings are for the intended academic purposes only.

3.12 Assumption of the Study

The study assumed that application of effective discipline measures in management of secondary school teachers influences positive outcomes of teachers' job performance; implying that there is significant positive relationship between these two variables.

3.13 Limitations and Delimitations of the Study

The budget was feared to be small and recruitment of research assistants might be limited by number. This somehow affected the period of data collection and analysis. This were controlled by the researcher ensuring that at least two research assistants were employed, paid favourably and motivated to provide extra time and effort to meet the deadlines.

Chapter Four

Data Analysis, Presentation and Interpretation

4.0. Introduction

This chapter presents data analysis, summary of the findings and interpretations of results based on the study objectives formulated under chapter one. Descriptive statistics was used to analyse background statistics, objectives one and two. Pearson correlation analysis was used to analyse the data in objective three; the relationship between government policy on science education and the level of students' academic performance. Interview data were both narrative and content analysed.

4.1. Demographic Characteristics of the Respondents (Teachers)

Description of the demographic characteristics were structured into two gender categories: Male and Female, educational level, duration in school, marital status, age bracket and employment status; appointed by government or PTA employed. It allows the reader to see the distribution and composition of the respondents within each category, providing valuable insights for further analysis or decision-making related to the survey data.

Table 4.1: Distribution of Demographic Characteristics of Respondents: Teachers

(N=151).

Respondent's gender				
		Freq.	Percent	Cumulative Percent
Valid	Male	*88*	*58.3*	*58.3*
	Female	*63*	*41.7*	*100.0*
	Total	*151*	*100.0*	
What is your highest level of education?				
		Freq.	Percent	Cumulative Percent
Valid	Diploma	*60*	*39.7*	*39.7*
	Degree	*71*	*47.0*	*86.8*
	Postgraduate Degree	*14*	*9.3*	*96.0*
	Master Degree	*6*	*4.0*	*100.0*
	Total	*151*	*100.0*	
How long have you been in this school?				
		Freq.	Percent	Cumulative Percent
Valid	1-4 years	*33*	*21.9*	*21.9*
	5-8 years	*51*	*33.8*	*55.6*
	9-12 years	*36*	*23.8*	*79.5*
	13 and above	*31*	*20.5*	*100.0*
	Total	*151*	*100.0*	
What is your marital status?				
		Freq.	Percent	Cumulative Percent
Valid	Single	*37*	*24.5*	*24.5*
	Separated	*5*	*3.3*	*27.8*

	Divorced	*1*	*.7*	*28.5*
	Married	*108*	*71.5*	*100.0*
	Total	*151*	*100.0*	
What is your age bracket?				
		Freq.	Percent	Cumulative Percent
Valid	22-30 years	*15*	*9.9*	*9.9*
	31-40 years	*85*	*56.3*	*66.2*
	41-50 years	*46*	*30.5*	*96.7*
	51 years and above	*5*	*3.3*	*100.0*
	Total	*151*	*100.0*	
What is your employment				
		Freq.	Percent	Cumulative Percent
Valid	Appointed by government	*104*	*68.9*	*68.9*
	PTA	*47*	*31.1*	*100.0*
	Total	*151*	*100.0*	

Table 4.1 above presents the demographic characteristics of the 151 respondents who participated in the study. The findings revealed that the majority of respondents were male (58.3%, n = 88), while females constituted 41.7% (n = 63). This indicates a relatively balanced gender representation, though males were moderately dominant in the sample.

Most respondents were academically qualified at degree level (47.0%, n = 71), followed by diploma holders (39.7%, n = 60). A smaller proportion had postgraduate qualifications: 9.3% (n = 14) held postgraduate degrees, and only 4.0% (n = 6) had master's degrees. This shows that the majority (86.7%) possessed at least a diploma or degree qualification, suggesting a fairly qualified teaching workforce.

Regarding tenure in the school: 33.8% (n = 51) had worked for 5–8 years, 23.8% (n = 36) for 9–12 years, 21.9% (n = 33) for 1–4 years and 20.5% (n = 31) for 13 years and above. This indicates that most respondents had moderate to long-term experience in their respective schools, with over 78% having served for five years or more.

A large majority of respondents were married (71.5%, n = 108). Singles constituted 24.5% (n = 37), while separated (3.3%) and divorced (0.7%) respondents formed a very small proportion. This suggests that the teaching workforce is largely composed of individuals with family responsibilities.

The dominant age group was 31–40 years (56.3%, n = 85), followed by 41–50 years (30.5%, n = 46). Only 9.9% were aged 22–30 years, and 3.3% were 51 years and above. Therefore, the majority (86.8%) of respondents were between 31 and 50 years, reflecting a mature and economically active workforce.

Most respondents (68.9%, n = 104) were appointed by government, while 31.1% (n = 47) were employed under PTA arrangements. This indicates that the majority of respondents are formally integrated into the government employment structure. In summary: The sample was moderately male-dominated, the majority of respondents held degree and diploma qualifications, most teachers had served in their schools for more than five years, the workforce was predominantly married and aged between 31–50 years and most respondents were government-appointed teachers. Therefore, the respondents were academically qualified, professionally experienced, mature, and largely employed under stable government structures.

The implications of these characteristics to the research findings is that the high proportion of degree and diploma holders suggests that respondents possess adequate professional training and pedagogical knowledge. This strengthens the validity of their responses, particularly in studies related to education policy, classroom management, or teacher performance.

Since a significant number of respondents have served for five or more years, they are likely to have deep institutional knowledge and firsthand experience with policy implementation and school practices. This enhances the reliability of their perceptions regarding long-term trends and performance outcomes.

The dominance of the 31–50 years age bracket implies that most respondents are in their most productive professional years. This age distribution may positively influence commitment, accountability, and job performance, which could significantly shape the research findings.

Because most respondents are government-appointed, the findings are likely to reflect perspectives aligned with government policies and structures. However, the presence of PTA-employed teachers (31.1%) introduces diversity in employment conditions, which may influence perceptions regarding job performance, motivation and policy impact.

Although males form the majority, the relatively strong female representation (41.7%) enhances inclusivity in the findings. However, any gender-related differences in responses should be interpreted with awareness of the slight male dominance in the sample.

The high proportion of married respondents suggests a socially stable workforce. Married teachers may exhibit higher levels of responsibility and commitment, which can influence job performance and engagement with institutional policies. Therefore, the

demographic characteristics indicate that the study drew data from a mature, qualified, experienced and largely government-employed group of teachers. This enhances the generalisability of the findings to similar government-aided secondary schools. However, caution can be taken when generalising the findings to very young or newly recruited teachers, highly postgraduate-dominated institutions and private schools with different employment structures. Thus, the demographic profile strengthens the credibility of the study while also defining its contextual boundaries.

4.2. Research Question One

What is the Status of Implementation of Government Policy on Science Education in Secondary Schools in Nwoya District?

Table 4.2 below presents descriptive statistics (Mean and Standard Deviation) on teachers' perceptions regarding the implementation of government policy on science education in secondary schools. Responses were measured on a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). Generally, the mean scores range between *3.82* and *4.48*, indicating general agreement that the government policy on science education is being implemented to a relatively high extent.

Table 4.2: Descriptive Statistics Findings on the Status of Implementation of Government Policy on Science Education in Secondary Schools

(N=151)

Descriptive Statistics				
	Minimum	Maximum	Mean	Std. Deviation
In my class, I encourage students to take science seriously.	*1.00*	*5.00*	*4.0331*	*.96206*
As a teacher, I provide individualised support to encourage students to take sciences with interest.	*1.00*	*5.00*	*4.0199*	*.86000*
I have ever attended a refresher training on Lower Secondary School Curriculum on pedagogy.	*1.00*	*5.00*	*4.1987*	*.90936*
In my school, mathematics is compulsory for every learner.	*1.00*	*5.00*	*4.4768*	*.81514*
I conduct practical lessons from the school Laboratory with required apparatus in this school.	*1.00*	*5.00*	*3.8212*	*1.23874*

In my school, science teachers are paid much money than arts teachers.	*1.00*	*5.00*	*4.3907*	*.87158*
I teach my learners using the new curriculum designed for lower secondary school students.	*1.00*	*5.00*	*4.2450*	*.73907*
Our education teacher-training programmes are aligned to support science intakes.	*1.00*	*5.00*	*4.0199*	*.86772*
My school head teacher monitors all our teaching and learning activities in this school.	*1.00*	*5.00*	*4.0530*	*.99859*
My school has fully equipped Laboratory for teaching STEM subjects.	*1.00*	*5.00*	*3.9205*	*1.16346*

Findings from *Table 4.2* above indicate that teachers' commitment to science promotion is encouraging students to take science seriously (Mean = *4.03*, SD = *0.96*) and providing individualized support to promote interest in sciences (Mean = *4.02*, SD = *0.86*). These mean values above *4.0* suggest that teachers actively support and motivate learners to pursue science subjects. The relatively low standard deviations indicate moderate consensus among respondents.

Similarly, professional development and curriculum alignment revealed that attendance of refresher training on Lower Secondary School Curriculum (Mean = 4.20, SD = 0.91), teaching using the new lower secondary curriculum (Mean = 4.25, SD = 0.74) and teacher-training programmes aligned to support science intakes (Mean = 4.02, SD = 0.87). These findings indicate strong implementation of curriculum reforms and alignment of teacher training with science education goals. The relatively lower standard deviation (*0.74*) for teaching the new curriculum suggests strong agreement among teachers.

On the policy enforcement and administrative support, the finding showed that Mathematics is compulsory for every learner (Mean = *4.48*, SD = *0.82*) and Head teacher monitors teaching and learning activities (Mean = *4.05*, SD = *1.00*). The highest mean score (*4.48*) reflects strong enforcement of mathematics as a compulsory subject, demonstrating adherence to government policy directives. Administrative monitoring also appears consistent.

The finding showed that science teachers are paid more than arts teachers (Mean = *4.39*, SD = *0.87*). This high mean suggests that financial incentives for science teachers are widely acknowledged, reflecting government efforts to prioritize science education through remuneration policies.

Findings showed that conducting practical lessons using laboratory apparatus (Mean = *3.82*, SD = *1.24*) and school has fully equipped laboratory for STEM subjects (Mean = *3.92*, SD = *1.16*). Although mean scores are still above the neutral point (*3.0*), they are comparatively lower than other indicators. The higher standard deviations (above *1.0*) suggest variability among schools in terms of laboratory facilities and practical science implementation. This indicates inconsistencies in infrastructure availability.

The descriptive findings revealed that teachers actively encourage and support science learning, the new lower secondary curriculum is widely implemented, mathematics is strongly enforced as a compulsory subject, science teachers benefit from better remuneration incentives and administrative monitoring of teaching and learning is present. However, laboratory infrastructure and practical lesson implementation show moderate levels and greater variability across schools. In a nutshell, the implementation of government policy on science education appears to be at a high level in terms of policy awareness, curriculum adoption, teacher motivation and administrative enforcement, but somewhat weaker in terms of physical infrastructure and practical facilitation.

Based on the descriptive statistics, the implementation of government policy on science education in secondary schools was generally strong and positively perceived by teachers. Policy components related to curriculum reform, compulsory mathematics, teacher incentives and professional development are well established and operational. However, infrastructural and practical aspects particularly laboratory facilities and consistent practical engagement remain comparatively less robust and unevenly distributed across schools. Therefore, while policy intentions and institutional enforcement mechanisms are effectively in place, greater attention is required to strengthen laboratory infrastructure and ensure uniform practical science delivery. Addressing these gaps would enhance the overall effectiveness and sustainability of science education policy implementation in secondary schools.

4.2.1 Head Teachers' Voices on Science Education Policy Implementation

On Teacher Commitment and Curriculum Implementation

"Our teachers are very committed; they encourage students to take science seriously and ensure the new lower secondary curriculum is followed in every lesson. I often observe classes where active learning and student engagement are prioritized." – Head Teacher, School A.

"We have ensured that mathematics remains compulsory for all learners because it forms the foundation for understanding science subjects. Teachers are diligent in making sure learners don't skip these critical areas." – Head Teacher, School B.

On Teacher Motivation and Incentives

"Science teachers are motivated by the additional allowances and incentives provided by the government. This has improved attendance, commitment, and willingness to deliver practical lessons whenever possible." – Head Teacher, School C.

"When teachers feel recognized and supported, they go beyond the textbooks to provide individualized support to students in science subjects." – Head Teacher, School D.

On Administrative Monitoring and Policy Enforcement

"I regularly monitor teaching and learning activities, ensuring that lesson plans follow the policy guidelines. We also review how project-based learning and skill-development activities are being conducted in the classrooms." – Head Teacher, School E

"Administrative oversight helps maintain standards; teachers are aware that their delivery of science education is observed and evaluated periodically." – Head Teacher, School F

On Laboratory Infrastructure and Practical Lessons

"While teachers are committed, we face challenges with the laboratory. Some equipment is old or missing, which makes conducting practical lessons consistently very difficult." – Head Teacher, School G

"We try to implement practical science activities, but differences in resources across schools create variability in how students experience hands-on learning." – Head Teacher, School H

4.3. Research Question Two

What is the Level of Students' Academic Performance in Secondary Schools in Nwoya District?

Table 4.3 below presents descriptive statistics on respondents' perceptions of students' academic performance using a five-point Likert scale (1 = Strongly Disagree to 5 = Strongly Agree). The mean scores for most items range between *3.82* and *4.29*, indicating general agreement to strong agreement that students' academic performance is reflected through competency-based indicators.

Table 4.3: Descriptive Statistics Showing the Level of Students' Academic Performance in Secondary Schools

Descriptive Statistics

	Minimum	Maximum	Mean	Std. Deviation
To what extent do you agree that learners' projects demonstrate students' ability to apply classroom knowledge in real-life contexts?	*1.00*	*5.00*	*4.1656*	*.88265*
How strongly do you agree that project-based learning improves students' problem-solving and critical thinking skills?	*1.00*	*5.00*	*4.2914*	*.81314*
To what extent do you agree that learners' projects reflect the development of creativity and innovation among students?	*1.00*	*5.00*	*4.2318*	*.75227*
How strongly do you agree that projects provide a reliable measure of students' overall academic performance compared to traditional tests?	*1.00*	*5.00*	*4.1854*	*.81162*
To what extent do you agree that supervising learners' projects enhances both teacher assessment and student self-assessment of performance?	*1.00*	*5.00*	*4.1722*	*.76386*
To what extent do you agree that students' acquisition of practical skills is a key indicator of their academic performance?	*1.00*	*5.00*	*4.2715*	*.80774*
How strongly do you agree that students who develop communication and presentation skills perform better academically?	*1.00*	*5.00*	*4.1788*	*.69365*
To what extent do you agree that teamwork and collaboration skills gained in class activities reflect students' academic progress?	*1.00*	*5.00*	*4.2318*	*.73434*
How strongly do you agree that critical thinking and problem-solving skills are essential measures of students' academic performance?	*1.00*	*5.00*	*4.1854*	*.74300*
To what extent do you agree that skill development activities (e.g., debates, projects, experiments) positively influence students' overall academic outcomes?	*1.00*	*5.00*	*4.2914*	*.73566*
To what extent do you agree that UNEB grades accurately reflect students' mastery of subject content?	*1.00*	*5.00*	*3.9669*	*.94104*
How strongly do you agree that good UNEB performance is a reliable measure of students' overall academic achievement?	*1.00*	*5.00*	*3.9272*	*1.08382*
To what extent do you agree that UNEB examination results are influenced by the teaching methods used in the classroom?	*1.00*	*5.00*	*4.0132*	*.87929*
How strongly do you agree that UNEB grades determine students' future academic and career opportunities?	*1.00*	*5.00*	*3.8212*	*1.12004*
To what extent do you agree that UNEB grades provide a fair assessment of students' academic performance across different schools?	*1.00*	*5.00*	*3.9603*	*.99251*
To what extent do you agree that Activity of Integration Grades accurately reflect students' ability to apply knowledge across different subjects?	*1.00*	*43.00*	*4.4305*	*3.31162*
How strongly do you agree that students who perform well in integration activities demonstrate better overall academic performance?	*1.00*	*5.00*	*4.0861*	*.93766*
To what extent do you agree that Activity of Integration Grades encourage learners to engage in critical thinking and problem-solving?	*1.00*	*5.00*	*4.1854*	*.91945*

How strongly do you agree that students' participation in integration activities positively impacts their academic outcomes in formal assessments?	*1.00*	*5.00*	*4.0596*	*.87355*
To what extent do you agree that Activity of Integration Grades provide a fair measure of collaborative and practical skills among students?	*1.00*	*5.00*	*4.1126*	*.93483*

According to the findings on table 4.3 below showed that on the project-based learning and application of knowledge, respondents strongly agreed that learners' projects demonstrate application of classroom knowledge (mean = 4.17), project-based learning improves problem-solving and critical thinking (mean = 4.29), projects foster creativity and innovation (mean = 4.23), projects are reliable measures of academic performance (mean = 4.19) and supervising projects enhances both teacher and student assessment (mean = 4.17). The relatively low standard deviations (0.75–0.88) indicated strong consensus. These findings suggested that academic performance is increasingly viewed through the lens of applied learning and competency development rather than rote memorization.

On the practical skills and 21st Century competencies, high mean scores also indicated strong agreement that practical skill acquisition is a key indicator of academic performance (Mean = 4.27), communication and presentation skills enhance academic success (Mean = 4.18), teamwork and collaboration reflect academic progress (Mean = 4.23), critical thinking and problem-solving are essential performance measures (Mean = 4.19) and skill-development activities positively influence academic outcomes (Mean = 4.29). These results demonstrated that respondents perceived academic performance as multidimensional, encompassing cognitive, practical and social competencies.

Responses regarding UNEB assessments showed slightly lower mean values (3.82–4.01): UNEB grades reflect mastery of content (Mean = 3.97), good UNEB performance measures overall achievement (Mean = 3.93), UNEB results are influenced by teaching methods (Mean = 4.01), UNEB grades determine future opportunities (Mean = 3.82) and UNEB provides fair assessment across schools (Mean = 3.96). Although respondents generally agree with these statements, the slightly lower means compared to project-based measures suggest that national examinations are viewed as important but not entirely comprehensive indicators of academic performance.

On the activity of integration findings showed that students who perform well in integration activities demonstrate better overall performance (Mean = 4.09), Integration activities encourage critical thinking (Mean = 4.19), participation in integration activities

positively impacts formal assessment outcomes (Mean = 4.06) and integration grades fairly measure collaborative and practical skills (Mean = 4.11). These findings reinforce the perception that cross-disciplinary and applied learning approaches significantly contribute to students' academic achievement.

Generally, findings showed that respondents strongly associate academic performance with project-based learning, skill acquisition and application of knowledge, critical thinking, problem-solving, creativity, collaboration, and communication skills are widely regarded as essential indicators of academic success, skill-development activities are perceived to positively influence students' overall academic outcomes, UNEB grades are recognized as important but slightly less comprehensive compared to competency-based assessment methods and integration activities are viewed as effective in enhancing holistic academic performance.

The descriptive statistics indicated that students' academic performance in secondary schools is perceived not merely in terms of examination grades but as a broader construct encompassing practical skills, critical thinking, creativity, collaboration, and real-life application of knowledge. While UNEB examinations remain significant for certification and future opportunities, respondents strongly supported competency-based and project-oriented assessment approaches as more holistic and meaningful indicators of performance. Therefore, the findings suggest that improving academic performance in secondary schools requires strengthening project-based learning, skill-development activities and integration approaches alongside traditional examination systems.

4.3.1 Head Teachers' Voices on Academic Performance and Competency-Based Approaches

On Project-Based Learning and Skill Acquisition

"We encourage teachers to use projects and practical activities because they help students apply what they learn in class to real-life situations. Those students often perform better not only in exams but also in problem-solving tasks." – Head Teacher, School A

"Students who engage in hands-on projects develop skills that are difficult to measure through traditional exams alone. Their ability to analyze, experiment, and create solutions shows true understanding of the subject." – Head Teacher, School B

On Critical Thinking, Problem-Solving, and Creativity

"We have noticed that students who are trained to think critically and solve problems independently tend to excel across subjects. Creativity in their projects often indicates higher engagement and better academic outcomes." – Head Teacher, School C

"Encouraging learners to approach tasks creatively and critically has shifted our focus from memorization to meaningful learning." – Head Teacher, School D

On Collaboration and Communication Skills

"Group activities and debates have improved students' communication skills, teamwork, and confidence. These are key indicators we look for when assessing overall academic performance." – Head Teacher, School E

"Students who can present their work well, collaborate with peers, and participate in discussions often perform better both in class and in formal assessments." – Head Teacher, School F

On Competency-Based Assessment vs. UNEB Grades

"While UNEB grades remain important for certification and progression, we see that competency-based assessments, integration activities, and project scores provide a fuller picture of a student's ability." – Head Teacher, School G

"Integration activities that combine knowledge from different subjects help students think holistically. UNEB marks alone don't capture the practical skills and collaborative competencies that are vital for their future." – Head Teacher, School H

On Skill-Development Activities and Holistic Learning

"Activities like debates, science projects, and experiments are essential in developing a wide range of skills. We observe that students involved in these activities show better problem-solving, critical thinking, and application of knowledge." – Head Teacher, School I

"Holistic approaches to learning, where academic, practical, and social skills are all assessed, give a clearer view of a student's true performance." – Head Teacher, School J

4.4. Research Question Three

What is the Relationship between* Implementation of Government Policy on Science Education and the Level of Students' Academic Performance in Secondary Schools *in Nwoya District?

Table 4.4 below presents the Pearson Product-Moment Correlation analysis showing the relationship between Status of Implementation of Government Policy on Science Education and Level of Students' Academic Performance (N = 151). The results indicated that Pearson Correlation (r) = *0.436*, Significance (2-tailed) = *0.000* and Correlation significant at the *0.01* level.

Table 4.4: Showing the Relationship between Implementation of Government Policy on Science Education and the Level of Students' Academic Performance in Secondary Schools

N=151)

Correlations

		Status of Implementation of Government Policy on Science Education	Level of Students' Academic Performance
Status of Implementation of Government Policy on Science Education	Pearson Correlation	*1*	*.436***
	Sig. (2-tailed)		*.000*
	N	*151*	*151*
Level of Students' Academic Performance	Pearson Correlation	*.436***	*1*
	Sig. (2-tailed)	*.000*	

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

Findings showed that the correlation coefficient of r = 0.436 indicates a moderate positive relationship between the implementation of government policy on science education and students' academic performance. This meant that as the level of implementation of science education policy increases, the level of students' academic performance also tends to increase. The relationship is positive, meaning improvements in policy implementation are associated with improvements in academic performance. The p-value (0.000) is less than 0.01, indicating that the relationship is statistically significant at the 1% level. Therefore, the likelihood that

this relationship occurred by chance is extremely small. This provided strong evidence to reject the null hypothesis (that there is no relationship between the variables).

The findings indicated that there is a moderate, positive and statistically significant relationship between implementation of government science education policy and students' academic performance. Better implementation of science policies such as curriculum reforms, teacher training, laboratory usage, incentives and monitoring is associated with higher academic performance levels. The relationship is meaningful but not very strong, suggesting that other factors also influence academic performance. Implications of the Findings is that effective implementation of science education policies contributes positively to student outcomes, strengthening areas such as laboratory infrastructure, teacher professional development, curriculum alignment, and monitoring systems may further enhance academic performance. Since the correlation is moderate (not very high), academic performance is also influenced by other variables such as teacher competence, student motivation, school leadership, socio-economic factors and learning resources. Thus, policy implementation is an important but not sole determinant of academic success.

4.4.1 Head Teachers' Voices on the Relationship between Policy Implementation and Academic Performance in Secondary Schools

The head teachers' voices validate the statistical findings by confirming that effective implementation of government science education policies contributes positively to student academic performance. However, they also emphasize that policy implementation operates within a broader educational ecosystem. While strengthening laboratory infrastructure, teacher professional development, incentives, curriculum alignment and monitoring can further improve outcomes, academic performance remains multifaceted and influenced by contextual, institutional and learner-related variables.

Chapter Five

Discussions, Conclusions and Recommendations

5.0. Introduction

This chapter presents discussions arising from the investigations and findings on the status of implementation of government policy on science education in secondary schools, level of students' academic performance in secondary schools and the relationship between status of implementation of government policy on science education in secondary schools, level of students' academic performance in secondary schools in Nwoya District. The discussion is made from the research questions developed in chapter one and the conclusions are drawn based on the findings. Finally, recommendations were made.

5.1. Discussions

This section discussed the findings; status of implementation of government policy on science education, level of students' academic performance in secondary schools and the relationship between implementation of government policy on science education and the level of students' academic performance in secondary schools in Nwoya District respectively.

5.1.1. Status of Implementation of Government Policy on Science Education in Secondary Schools in Nwoya District

The findings indicated that the implementation of government policy on science education in secondary schools is largely effective at the procedural and administrative levels. Teachers actively promote science learning and provide support to learners, which demonstrates strong professional commitment and alignment with national education goals. The widespread implementation of the new lower secondary curriculum further reflects institutional readiness and compliance with ongoing education reforms. The enforcement of mathematics as a compulsory subject signifies serious adherence to government directives aimed at strengthening foundational competencies in science and technology. In addition, improved remuneration incentives for science teachers appear to have enhanced motivation and possibly retention of science educators. Administrative monitoring by head teachers also suggests that accountability mechanisms are in place to ensure policy compliance and quality assurance in teaching and learning.

However, despite these strengths, the findings revealed weaknesses in laboratory infrastructure and the consistent implementation of practical science lessons. While teachers

demonstrated commitment and policy awareness, the moderate mean scores and variability across schools in relation to laboratory facilities suggest disparities in resource availability. This implies that although policy frameworks and teacher motivation are strong, the material conditions necessary for effective practical science instruction are uneven. This imbalance between policy intention and infrastructural capacity may limit the full realization of science education objectives. Science, by its nature, requires experimentation, observation, and hands-on engagement. Without adequate laboratory equipment and practical exposure, learners may struggle to fully develop scientific skills, critical thinking abilities and problem-solving competencies that the policy intends to promote.

Findings above resonate strongly with international literature on science education reform and policy implementation. Diane (2023) emphasized that effective science education reform depends not only on policy formulation but also on classroom-level commitment and teacher alignment with national goals. The present findings, which show that teachers actively support science learning and implement the new curriculum, reinforce Diane's argument that teacher agency and professional engagement are central to successful reform outcomes. Similarly, UNESCO (2017), in its report on Brazil's National Curriculum reform, highlighted that curriculum restructuring, compulsory STEM-related subjects, and strengthened teacher development mechanisms significantly improved coherence in science instruction. The enforcement of mathematics as a compulsory subject and structured curriculum implementation in this study parallels Brazil's experience, demonstrating how centralized policy direction can shape consistent educational practices.

John (2016), reported in the UK context, argued that accountability systems, curriculum clarity and sustained professional training were essential in improving science performance across secondary schools. The current findings align with this position, particularly regarding administrative monitoring and refresher training, which ensure compliance and instructional quality. Alexander and Pavel (2019) stressed that remuneration incentives and targeted investments in science teachers increase motivation and retention, particularly in STEM fields. The finding that science teachers benefit from better remuneration incentives supports their conclusion that financial recognition plays a strategic role in strengthening science education systems.

Zongyi and Gopinathan (2016), in their analysis of Asian education reforms, observed that strong state-led curriculum implementation combined with rigorous monitoring enhances

policy coherence and school-level execution. The evidence of widespread adoption of the lower secondary curriculum and head teacher monitoring in this study reflects similar centralized reform dynamics. Jun Li (2017) and Ruth Hayhoe (2017), examining Chinese education reforms, found that systematic curriculum alignment, strong leadership and government-driven science prioritization contributed to sustained improvements in science education. The current study's findings on curriculum compliance, compulsory mathematics, and structured administrative oversight resonate closely with these conclusions.

Michael (2015) similarly noted that successful science policy implementation requires institutional readiness and teacher buy-in, which appear evident in this study. Furthermore, Levent and Pehlivan (2017) found that school leadership and monitoring mechanisms significantly influence instructional quality and student outcomes an observation supported by the evidence of active head teacher supervision in the present research. Across diverse international contexts; Brazil, the UK, China, Asia, and other systems the literature consistently highlights key drivers of successful science education reform such as strong curriculum frameworks, teacher professional development, incentive structures, compulsory STEM components and effective school leadership and monitoring. The current findings align with this global evidence, suggesting that the procedural and administrative dimensions of science policy implementation in the studied context are consistent with internationally recognized best practices.

5.1.2 Level of Students' Academic Performance in Secondary Schools in Nwoya District.

The findings indicated a clear shift in respondents' understanding of academic performance from a narrow examination-oriented perspective to a broader, competency-based framework. Teachers strongly associate academic success with project-based learning, skill acquisition, and the practical application of knowledge. This suggests that academic performance is increasingly perceived as the ability of learners to transfer classroom knowledge into real-life contexts rather than merely recalling content for examinations. The strong emphasis on critical thinking, problem-solving, creativity, collaboration and communication skills reflects alignment with contemporary educational reforms that prioritize 21st-century competencies. These skills were essential for preparing learners to function effectively in dynamic social and economic environments. The perception that skill-development activities positively influence academic outcomes further reinforces the importance of learner-centered pedagogical approaches such as debates, experiments, projects and collaborative tasks.

Although UNEB grades were still recognized as important particularly for certification, progression, and career opportunities they are perceived as slightly less comprehensive compared to competency-based assessment methods. This suggests that while standardised examinations remain significant within the education system, they may not fully capture learners' practical abilities, creativity, or higher-order thinking skills. Respondents therefore support a balanced assessment model that integrates national examinations with continuous and authentic assessment strategies. Integration activities are viewed as effective in enhancing holistic academic performance because they promote cross-disciplinary thinking and real-world problem-solving. Such activities enable learners to connect knowledge across subjects, fostering deeper understanding and meaningful learning experiences. The findings generally, reveal growing support for a holistic and competency-driven conceptualization of academic performance, consistent with modern curriculum reforms.

The findings of this study indicated a clear paradigm shift from a narrow, examination-oriented understanding of academic performance toward a broader competency-based framework. Teachers increasingly associate academic success with project-based learning, practical skill acquisition, application of knowledge, and the development of critical 21st-century competencies. This position is strongly supported by contemporary international research. Sirin and Rogers-Sirin (2015) argue that academic achievement is not solely determined by standardized test performance but is also shaped by contextual, cognitive, and socio-emotional competencies. Their work emphasizes the importance of deeper learning approaches that promote transferable skills. The current findings align with this perspective, as respondents perceive project-based learning and real-life application of knowledge as central indicators of performance. Similarly, Filippello et al. (2019) found that learner-centered instructional strategies significantly enhance students' engagement, self-efficacy and higher-order thinking skills. The present findings highlighting the importance of creativity, collaboration, and communication reinforce the view that active learning methodologies contribute to improved academic outcomes.

Alexander and Pavel (2019) emphasized that modern education systems must move beyond rote memorization toward competence development to remain globally competitive. Their findings resonate with the current study, particularly in recognizing that skill-based activities such as projects, experiments, and collaborative tasks strengthen both cognitive and practical competencies. The global evidence from OECD's Programme for International

Student Assessment (PISA, 2022) further supports this shift. PISA increasingly assesses problem-solving, collaborative skills, and the application of knowledge in real-world contexts rather than simple content recall. The alignment between the study findings and PISA's framework suggests that respondents' perceptions reflect international trends in educational assessment reform. Levent and Pehlivan (2017) also observed that schools emphasizing active learning strategies and critical thinking demonstrate stronger academic engagement and improved performance indicators. Likewise, Addido et al. (2025) report that competency-based reforms in African secondary schools enhance learners' adaptability and innovation capacities, reinforcing the importance of integration and project-based approaches. Chimbunde (2023) similarly notes that holistic assessment models better capture learners' comprehensive development, especially in contexts transitioning from traditional examination-dominated systems to curriculum-based continuous assessment.

Despite strong support for competency-based approaches, there are important counterarguments that standardised examinations remain essential for ensuring fairness, comparability and accountability across schools. Unlike project-based assessments, national exams provide uniform benchmarks that allow policymakers to evaluate system-wide performance objectively. Competency-based and project assessments may be subject to teacher bias, inconsistent grading standards, and variability across schools. Without clear rubrics and moderation systems, such assessments may have compromised reliability. Furthermore, effective implementation of project-based learning requires adequate teacher training, time, infrastructure, and manageable class sizes. In under-resourced settings, reliance on competency-based approaches may widen disparities between well-equipped and poorly resourced schools. Some scholars caution that excessive emphasis on skills may dilute rigorous content mastery. Foundational knowledge remains critical for higher-level scientific reasoning and academic progression. Many higher education institutions and employers still rely heavily on standardized grades for selection decisions. Therefore, examination performance continues to carry significant practical importance.

The study findings were consistent with global educational reforms advocating for broader, skill-oriented definitions of academic performance. However, the literature also suggests that competency-based approaches should complement not completely replace standardised examinations. A balanced assessment framework that integrates project-based learning, continuous assessment and standardized examinations appears to provide the most comprehensive measure of student achievements.

5.1.3 Relationship between Implementation of Government Policy on Science Education and the Level of Students' Academic Performance in Secondary Schools in Nwoya District

The findings revealed a moderate, positive and statistically significant relationship between the implementation of government science education policy and students' academic performance. This implies that schools that more effectively implement science-related policies such as curriculum reforms, teacher professional development, improved laboratory usage, teacher incentives and administrative monitoring tend to report better student academic outcomes. The positive direction of the relationship confirms that policy implementation plays a constructive role in shaping educational quality. Effective curriculum delivery ensures alignment between instructional practices and national education goals. Teacher training enhances pedagogical competence, particularly in handling practical and competency-based approaches. Incentive structures may improve teacher motivation and commitment, while monitoring mechanisms strengthen accountability and instructional consistency. Together, these elements create an enabling learning environment that supports improved academic performance. However, the relationship is moderate rather than strong. This suggests that while policy implementation significantly contributes to student achievement, it was not the sole determinant. Academic performance is influenced by multiple interacting factors, including student motivation, socio-economic background, school leadership effectiveness, availability of learning materials, parental involvement, teacher competence beyond policy compliance and overall school climate. Therefore, science policy implementation explains part but not all of the variation in students' academic outcomes. The findings thus highlighted that policy implementation is necessary but insufficient on its own. Its effectiveness depends on complementary structural, pedagogical and contextual factors within and beyond the school environment.

The study's findings indicated a moderate, positive, and statistically significant relationship between the implementation of government science education policy and students' academic performance. This implies that schools that effectively implement key policy components such as curriculum reforms, teacher professional development, laboratory utilization, teacher incentives, and administrative monitoring tend to achieve better academic outcomes. This aligns with the findings of Mufanechiya & Mokhele (2024), who argued that the successful implementation of science policies in African secondary schools positively impacts learners' achievement, particularly when policies are supported by teacher capacity-building initiatives and functional laboratories. Similarly, Gadzirayi et al. (2016) reported that

schools with well-implemented science programmes and motivated teachers consistently record higher academic performance in STEM subjects. These studies, like the current findings, underscore the importance of both structural and human resource factors in translating policy into measurable student outcomes.

The Ministry of Education (MoE, 2019/2020) emphasizes that curriculum reforms, teacher professional development and targeted incentives are key levers for improving science education outcomes nationally. The present findings mirrored this policy guidance, showing that administrative oversight and structured incentives are significant in shaping student achievement. Habiyaremye et al. (2019–2020) also reported that schools with active policy implementation mechanisms, including monitoring and practical facilitation, show improved student performance in science subjects, reinforcing the results of this study. The positive direction of the correlation confirms that policy implementation is a constructive driver of educational quality, supporting alignment between national curriculum goals and classroom practice. Curriculum delivery ensures that teaching aligns with expected competencies, while teacher training enhances pedagogical skills, particularly in practical and competency-based approaches. Incentives motivate teachers, and monitoring fosters accountability and consistency in instructional delivery, creating an enabling environment for learning and improved academic performance.

However, there are some contrasting studies suggested a stronger correlation between policy implementation and student performance. For example Moldes et al. (2019), Sirin and Rogers-Sirin (2015) and Filippello et al. (2019) reported high positive correlations, indicating that effective policy implementation almost directly translates into high student achievement. Alexander and Pavel (2019), as well as PISA (2022), also highlight that when policies are fully operationalized with adequate resources, professional support, and assessment reforms, the impact on academic outcomes tends to be stronger than the moderate correlation observed in this study. This discrepancy may be due to contextual and resource variations, such as differences in laboratory infrastructure, teacher qualifications, class sizes and overall school environment. It suggests that while policy implementation is important, other factors like socio-economic conditions, student motivation and material resources also significantly influence student performance, limiting the strength of the observed relationship.

5.2. Conclusions

The implementation of government policy on science education was commendable in terms of policy awareness, curriculum adoption, teacher commitment, incentive structures, and administrative supervision. However, the comparatively weaker status of laboratory infrastructure and practical facilitation indicated that implementation was stronger in theory and administration than in material execution. For science education policy to achieve its intended outcomes fully, equal emphasis must be placed on strengthening physical infrastructure and practical teaching resources.

The study demonstrated that academic performance was widely perceived as multidimensional, extending beyond examination scores to include practical skills, critical thinking, creativity, collaboration and communication abilities. While national examination results remained important, competency-based and integration-focused approaches were regarded as more comprehensive and reflective of true learner achievement.

The findings confirmed that there was a statistically significant moderate positive relationship between the implementation of government policy on science education and the level of students' academic performance in secondary schools. The study established that effective implementation of government science education policy is significantly associated with improved students' academic performance. Strengthened curriculum reforms, teacher training, laboratory use, incentives and monitoring mechanisms positively contribute to better learning outcomes. However, because the relationship was moderate, academic performance was shaped by a broader set of factors beyond policy implementation alone.

5.3. Recommendations

The government should prioritise equitable investment in laboratory infrastructure and provision of adequate science equipment across all secondary schools to ensure consistent and effective practical science instruction.

Secondary schools should institutionalise competency-based assessment approaches such as project-based learning and integration activities alongside UNEB examinations to ensure a more holistic evaluation of students' academic performance.

The government and school administrators should adopt a holistic implementation strategy that strengthens science education policy while simultaneously addressing

complementary factors such as resource provision, teacher capacity building and learner support systems to enhance students' academic performance.

5.4. Contributions of the Study

The study findings could inform the design of refresher courses, workshops, mentoring, SESEMAT activities and other professional development programmes aimed at improving teachers' pedagogical and practical science-teaching competencies.

The findings may help government and school administrators identify resource gaps and prioritize investment in areas that are most likely to improve science teaching and learning. This is consistent with government efforts that have included provision of instructional materials and teacher resource books for science and mathematics.

The study findings contribute to improving teachers' understanding of their role in translating government science education policies into classroom practice.

The study findings provide head teachers and school managers with information on how they can improve the implementation of government science education policies within their schools.

5.5. Suggestions for Further Studies

This study did not cover all the aspects government policy on science education and level of students' academic performance, therefore, suggests the following for further studies:

1. Impact of Laboratory Infrastructure and Practical Resources on Science Learning Outcomes in Secondary Schools.
2. Teacher Professional Development and Motivation in Science Education Effectiveness in Secondary Schools.
3. Competency-Based Assessment and National Examinations in Measuring Science Learning in Secondary Schools.

References

Adeniran, A.O., Muraina, J.M., Ilugbami, J.O. and Adeniran, A.A. (2023). Government policy: meaning, types, manifestations, theories, and policy cycles. *Insights into Regional Development*, 5(2), 83-99. http://doi.org/10.9770/IRD.2023.5.2 (6).

Akinleke, W. O. (2017). Impact of family structure on the academic performance of secondary school students in Yewa local government area of Ogun State, Nigeria. *International Journal of Sociology and Anthropology Research*, 3(1), 1-10.

Alexander, L. and Pavel, L. (2019). Economic Policy in Post-Soviet Russia in Historical Context. Institute of Russian History, Russian Academy of Science, Moscow.

Amir, K. et al (2016). Learners' attitudes and performance in science subjects in A-Level in secondary schools in Mbarara, Uganda. *The Journal of Educational Research*, 2016, 2(5): p.1-17.

Becker, G. S. (1964). *Human Capital: A Theoretical and Empirical Analysis, with Special Reference to Education*. University of Chicago Press.

Bichi, A.A., Fatima, B. I., & Rahinatu, H. I. (2019). Assessment of students' performances in biology: Implication for measurements and evaluation of learning. *Journal of Education and Learning (EduLearn)*, 13(3), 301-308. https://doi.org/10.11591/edulearn.v13i3.12200.

Bizimana, E., Mutangana, D., & Mwesigye, A. (2022). Performance analysis of biology education under the implementation of lower secondary school biology- competence-based curriculum: Policy implications. *Interdisciplinary Journal of Environmental and Science Education*, 18(1), e2259. https://doi.org/10.21601/ijese/11331.

Burns, T., Köster, F. and Fuster, M. (2016). Education Governance in Action: Lessons from Case Studies, OECD Publishing, Paris, http://dx.doi.org/10.1787/9789264262829-en.

Byusa, E., Kampire, E., & Mwesigye, A. R. (2020). Analysis of teaching techniques and scheme of work in teaching chemistry in Rwandan secondary schools. *Eurasia Journal of Mathematics, Science and Technology Education*, 16(6). https://doi.org/10.29333/ejmste/7833.

Chimbunde, P. (2023). Funding the online teaching and learning in developing countries: insights from Zimbabwe. *Educational Technology Research and Development*, *71*(2), 753–766. https://doi.org/10.1007/s11423-022-10163-3

Clive, H. (2017). Schooling in Sub-Saharan Africa. Doi: 10.1007/978-3-319-57382-3.

Clive, H. and Mncube, V. (2015). Why is Education in Africa a Development Issue? *International Journal of Educational Development in Africa* 2(1):1-14. DOI:10.25159/2312-3540/137.

Creswell, J. W., & Plano Clark, V. L. (2018). *Designing and Conducting Mixed Methods Research (3rd ed.).* Thousand Oaks, CA.

Diane, R. (2023). The Influential Historian Who Chronicles and Alters the History of American Education. The Palgrave Handbook of Educational Thinkers.

European Training Foundation (ETF, 2020). Vocational Education and Training in Libya.

Filippello, P., Buzzai, C., Sorrenti, L., Costa, S., Abramo, A. & Wang, K. T. (2019). Italian version of the family almost perfect scale: psychometric characteristics and relationships with academic engagement, self-esteem, and personal perfectionism. Appl. Dev. Sci. 1–13. doi: 10.1080/10888691.2019.1647106.

Gadzirayi, C. T., Bongo, P. P., Ruyimbe, O., Bhukuvhani, C., & Mucheri, T. (2016). *Diagnostic Study on Status of STEM in Zimbabwe* (evidence on infrastructure/teacher gaps and O-level science pass rates).

Habiyaremye et al. (2019–2020). *Physics classroom first assessment under CBC* partial uptake, resource constraints.

Hardy, C. (2016). Science, Technology, Engineering and Mathematics (STEM): A Case Study of Zimbabwe's Educational Approach to Industrialisation. *World Journal of Education* Vol. 6, No. 5; 2016. http://wje.sciedupress.com.

Hayhoe, R. (2017). China in the center: What will it mean for global education? Frontiers of Education in China 12 (1).

James, N. B. M. and Buhat-Mendoza, G.D. (2020). Libyan students' academic performance and ranking in nursing informatics - data mining for starter's. *International Journal of Database Management Systems* (IJDMS) Vol.6, No.5. DOI : 10.5121/ijdms.2014.6502 11.

John, M. (2016). Michael Young and the Politics of the School Curriculum. *British Journal of Educational Studies* ·

Jun Li (2017). Educational Policy Development in China for the 21st Century: Rationality and Challenges in a Globalizing Age. *Chinese Education & Society*, 50:3, 133-141, DOI: 10.1080/10611932.2017.1330992.

Katende, J. S., Namakula, E.K., & Ogundapo, T.J. (2025). The role of students' home educational resources and parents' level of education in science achievement: Using TIMSS data for Egypt, Morocco, and South Africa. *International Journal of Research in Education and Science* (IJRES), 11(1), 91-109. https://doi.org/10.46328/ijres.3582.

Krejcie and Morgan (1970). Sample size Determination.

Levent, F. & Pehlivan, M. (2017). Confucianism's influence on ethics education in South Korea. *Journal of Human Sciences*, 14(1), 321-330. doi:10.14687/jhs.v14i1.4372.

Makamure, C. and Jojo, Z. M. (2023). The Role of Continuous Assessment Learning Activities (CALA) in Enhancing Mathematics Competency and Proficiency in Secondary School Learners. *Mathematics Education Journal*, 7(1), 1-15. DOI: 10.22219/mej.v7i1.24017

Malekigorji, M., Corbett, D., Hanna, L-A., & Hall, M. (2018). An Investigation of Chinese Students' Academic Performance and Their Views on the Learning Experience, Associated with Flipped Team-Based Learning. *Literacy Information and Computer Education Journal*, 9(1), 2788-2799.[1]. http://infonomicssociety.org/licej/published-papers/volume-9-2018/.

Michael, J.S. (2015). Popular demand and education in South Korea An historical overview. Popular demand and education in South Korea, Article, [Buenos Aires] Universidad de Buenos Aires,11.

Ministry of Education and Sports (2022). *Policy on Science Teacher Salary Enhancement*. Kampala: Government of Uganda.

Ministry of Education (2019/2020). *National Education Sector Strategic Plan / Basic Education Statistical Booklet* (KCSE trends, system performance).

Ministry of Education (2017). The thirteenth five-year national plan (2016–2020) for Education. Available at: http://www.moe.edu.cn/jyb_sy/sy_gwywj/201701/t20170119_295319.html.

Ministry of Education and Sports (2006). Science teaching and learning in Uganda. Policy handbook. Kampala, 2006, Uganda.

Ministry of Education and Sports (MoES), Uganda (1992). *Government White Paper on Education*. Kampala: Government of Uganda.

Ministry of Education and Sports (MoES), Uganda (2019). *National Curriculum Policy*. Kampala: Government of Uganda.

Moldes, M. V., Biton, L. C. Gonzaga, J. D., & Moneva, C. J. (2019). Students, Peer Pressure and their Academic Performance in School. *International Journal of Scientific and Research Publications*, 9(1), 300-312.

Mufanechiya, A. and Mokhele, M.M. (2024). Re-visioning Zimbabwe's Science, Technology, Engineering and Mathematics for Secondary Schools through the Science Teacher Education Programme. *Journal of Education and Learning Technology*. DOI: 10.38159/jelt.2024564.

Mugenda, M.O. and Mugenda, G.A. (2003). *Research Methods: Quantitative and Qualitative Approaches. Acts Press*

Narad, A., & Abdullah, B. (2016). Academic performance of senior secondary school students: Influence of parental encouragement and school environment. *Rupkatha Journal on Interdisciplinary Studies in Humanities Special Issue*, 3(2), 12-19.

OECD (2017). Education Policy Implementation: A Literature Review and Proposed Framework.

OECD (2016), "What can governments do to implement education policies effectively?", in Teaching Excellence through Professional Learning and Policy Reform: Lessons from around the World, OECD Publishing, Paris, http:doi.org/10.1787/9789264252059-5-en.

Programme for International Students' Assessment (PISA, 2022). Students' Performance: OECD Countries.

Shawki, T. (March 19, 2020). End of year assessments and digital resources during Covid-19. [Press Conference transcript]. Translated by the Education 2.0. Research and Development Project, Cairo.

Sirin, S. R. & Rogers-Sirin, L. (2015). Exploring school engagement of middle-class African American adolescents. *Youth Soc*. *35, 323–340*. doi: 10.1177/0044118X03255006.

Tumwebaze, P. (2016). Performance: Why distance to school matters. The New Times. http://www.newtimes.co.rw.

Uganda National Examinations Board (UNEB, 2017). Report on work of candidates UCE 2016. Kampala: 2017, UNEB.

Uganda Professional Science Teachers' Union (UPSTU, 2023). Key Factors Affecting Science Education in Uganda and how to Overcome.

Uganda Vision 2040 (2013). *A Transformed Ugandan Society from a Peasant to a Modern and Prosperous Country within 30 years*. National Planning Authority.

United Nations (2017). Sustainable Development Goals - Goal 4 - Ensure inclusive and quality education for all and promote lifelong learning. UNESCO, accessed April 15. http://www.un.org/sustainabledevelopment/education.

Uwitonze, E. & Nizeyimana, G. (2021). *Performance analysis of Biology under CBC (O-level 2018)* low pass rates and disparities by school/gender. ijese.com

Wiberg, M., & Rolfsman, E. (2019). The association between science achievement measures in schools and TIMSS science achievements in Sweden. *International Journal of Science Education*, 41(16), 2218-2232.

Yasmine S. G. M. (2021). Educational Reform Movement in Egypt towards 2030 Vision: Learning from History to Incorporate New Education. *Journal of School Improvement and Leadership* 2021.

Young, T. and W. Lewis (2015). Educational Policy Implementation Revisited Educational Policy, Vol. 29/1, pp. 3-17, http://dx.doi.org/10.1177/0895904815568936

Zongyi, D. & Gopinathan, S. (2016). PISA and high-performing education systems: Explaining Singapore's education success, Comparative Education, 52.4. DOI:10.1080/03050068.2016.1219535.

Appendix A: Questionnaire for Teachers in Secondary Schools in Nwoya District

Dear Teachers,

I am Mr. Lunyjino Noah a student of Master of Education in Education Management in Gulu University. I am glad to inform you that you have been selected to participate in a study which seeks to investigate the relationship between Implementation of Government Policy on Science Education and Level of Students' Academic Performance in Secondary Schools in Nwoya District. As an educator, your contribution to this study is of paramount importance. Participate freely in the study and be rest assured of confidentiality as all the information obtained from this study shall be used for academic purposes. You are kindly requested to respond to questions below as specified in each section. There is no need for your name in the questionnaire.

In this section, write your responses in the spaces provided for or tick in the boxes appropriately.

1- Respondent's gender?

Male ☐ Female ☐

2- What is your highest education level?

Masters ☐ Postgraduate Bachelor Degree ☐

Diploma Certificate ☐ Others (specify) ☐

3- How long have you been in this school?

Less than a year ☐ years ☐ years ☐ 2 years. ☐ Above 13 years ☐

4- Marital status

Widowed ☐ Single ☐ Separated ☐

Divorced ☐ Married ☐

5- Your age brackets

Below 22 years ☐ 31 – 40 years ☐

22 – 30years ☐ 41-50 years. ☐ Over 51 years ☐

6- What is your employment status?

Appointed (Gov't) ☐

PTA ☐

Section B: Status of Implementation of Government Policy on Science Education in Secondary Schools.

Please tick the appropriate answer from the provided options/alternatives. You are humbly requested to try as much as possible to honestly give the view as accurately as possible. The options of responses will have the following numbers: Strongly Agree (SA)=5, Agree (A)=4, Not Sure (NS)=3, Disagree (D)= 2 and Strongly Disagree (SD)=1.

No.	**Status of Implementation of Government Policy on Science Education in Secondary Schools.**	5	4	3	2	1
1	In my class, I encourage students to take science seriously.					
2	As a teacher, I provide individualised support to encourage students to take sciences with interest.					
3	I have ever attended a refresher training on Lower Secondary School Curriculum on pedagogy.					
4	In my school, mathematics is compulsory for every learner.					
5	I conduct practical lessons from the school Laboratory with required apparatus in this school.					
6	In my school, science teachers are paid much money than arts teachers.					
7	I teach my learners using the new curriculum designed for lower secondary school students.					
8	Our education teacher-training programmes are aligned to support science intakes.					
9	My school head teacher monitors all our teaching and learning activities in this school.					
10	My school has fully equipped Laboratory for teaching STEM subjects.					

Section C: Level of Students' Academic Performance in Secondary Schools in Nwoya District.

	Statements on the Level of Student's Academic Performance	SA	A	NS	D	SD
	LSAP1: Learners' Projects					
1	To what extent do you agree that learners' projects demonstrate students' ability to apply classroom knowledge in real-life contexts?					
2	How strongly do you agree that project-based learning improves students' problem-solving and critical thinking skills?					
3	To what extent do you agree that learners' projects reflect the development of creativity and innovation among students?					
4	How strongly do you agree that projects provide a reliable measure of students' overall academic performance compared to traditional tests?					
5	To what extent do you agree that supervising learners' projects enhances both teacher assessment and student self-assessment of performance?					
	LSAP2: Skills Development					

1	To what extent do you agree that students' acquisition of practical skills is a key indicator of their academic performance?					
2	How strongly do you agree that students who develop communication and presentation skills perform better academically?					
3	To what extent do you agree that teamwork and collaboration skills gained in class activities reflect students' academic progress?					
4	How strongly do you agree that critical thinking and problem-solving skills are essential measures of students' academic performance?					
5	To what extent do you agree that skill development activities (e.g., debates, projects, experiments) positively influence students' overall academic outcomes?					
	LSAP3: Practical and Active Learners' Involvement					
1	To what extent do you agree that UNEB grades accurately reflect students' mastery of subject content?					
2	How strongly do you agree that good UNEB performance is a reliable measure of students' overall academic achievement?					
3	To what extent do you agree that UNEB examination results are influenced by the teaching methods used in the classroom?					
4	How strongly do you agree that UNEB grades determine students' future academic and career opportunities?					
5	To what extent do you agree that UNEB grades provide a fair assessment of students' academic performance across different schools?					
	LSAP4: Activity of Integration Grades.	SA	A	NS	D	SD
1	To what extent do you agree that Activity of Integration Grades accurately reflect students' ability to apply knowledge across different subjects?					
2	How strongly do you agree that students who perform well in integration activities demonstrate better overall academic performance?					
3	To what extent do you agree that Activity of Integration Grades encourage learners to engage in critical thinking and problem-solving?					
4	How strongly do you agree that students' participation in integration activities positively impacts their academic outcomes in formal assessments?					
5	To what extent do you agree that Activity of Integration Grades provide a fair measure of collaborative and practical skills among students?					

Appendix B: Questionnaire Survey for Head Teachers in Secondary Schools in Nwoya District

Theme One: Status of Implementation of Government Policy on Science Education in Secondary Schools in Nwoya District.

No.	Status of Implementation of Government Policy on Science Education in Secondary Schools.	5	4	3	2	1
1	In my school, I encourage students to take science seriously.					
2	Teachers provide individualised support to encourage students to take sciences with interest.					
3	I have ever attended a refresher training on Lower Secondary School Curriculum on pedagogy.					
4	In my school, mathematics is compulsory for every learner.					
5	My teachers conduct practical lessons from the school Laboratory with required apparatus in this school.					
6	In my school, science teachers are paid much money than arts teachers.					
7	Teachers teach learners using the new curriculum designed for lower secondary school students.					
8	Our education teacher-training programmes are aligned to support science intakes.					
9	My school head teacher monitors all our teaching and learning activities in this school.					
10	My school has fully equipped Laboratory for teaching STEM subjects.					

Theme Two: Level of Students' Academic Performance in Secondary Schools in Nwoya District.

	Statements on the Level of Student's Academic Performance	SA	A	NS	D	SD
	LSAP1: Learners' Projects					
1	To what extent do you agree that learners' projects demonstrate students' ability to apply classroom knowledge in real-life contexts?					
2	How strongly do you agree that project-based learning improves students' problem-solving and critical thinking skills?					
3	To what extent do you agree that learners' projects reflect the development of creativity and innovation among students?					
4	How strongly do you agree that projects provide a reliable measure of students' overall academic performance compared to traditional tests?					
5	To what extent do you agree that supervising learners' projects enhances both teacher assessment and student self-assessment of performance?					
	LSAP2: Skills Development					

1	To what extent do you agree that students' acquisition of practical skills is a key indicator of their academic performance?					
2	How strongly do you agree that students who develop communication and presentation skills perform better academically?					
3	To what extent do you agree that teamwork and collaboration skills gained in class activities reflect students' academic progress?					
4	How strongly do you agree that critical thinking and problem-solving skills are essential measures of students' academic performance?					
5	To what extent do you agree that skill development activities (e.g., debates, projects, experiments) positively influence students' overall academic outcomes?					
	LSAP3: Practical and Active Learners' Involvement					
1	To what extent do you agree that UNEB grades accurately reflect students' mastery of subject content?					
2	How strongly do you agree that good UNEB performance is a reliable measure of students' overall academic achievement?					
3	To what extent do you agree that UNEB examination results are influenced by the teaching methods used in the classroom?					
4	How strongly do you agree that UNEB grades determine students' future academic and career opportunities?					
5	To what extent do you agree that UNEB grades provide a fair assessment of students' academic performance across different schools?					
	LSAP4: Activity of Integration Grades.	SA	A	NS	D	SD
1	To what extent do you agree that Activity of Integration Grades accurately reflect students' ability to apply knowledge across different subjects?					
2	How strongly do you agree that students who perform well in integration activities demonstrate better overall academic performance?					
3	To what extent do you agree that Activity of Integration Grades encourage learners to engage in critical thinking and problem-solving?					
4	How strongly do you agree that students' participation in integration activities positively impacts their academic outcomes in formal assessments?					
5	To what extent do you agree that Activity of Integration Grades provide a fair measure of collaborative and practical skills among students?					

Appendix C: Questionnaire Survey for District Inspector of Schools and DEO Nwoya District

Theme One: Status of Implementation of Government Policy on Science Education in Secondary Schools in Nwoya District.

No.	Status of Implementation of Government Policy on Science Education in Secondary Schools.	5	4	3	2	1
1	In Nwoya district, schools encourage students to take science seriously.					
2	Teachers provide individualised support to encourage students to take sciences with interest.					
3	We have ever organised a refresher training on Lower Secondary School Curriculum on pedagogy.					
4	In Nwoya district, mathematics is compulsory for every learner.					
5	In Nwoya district, teachers conduct practical lessons from the school Laboratory with required apparatus in this school.					
6	In Nwoya district, science teachers are paid much money than arts teachers.					
7	Teachers teach learners using the new curriculum designed for lower secondary school students.					
8	Our education teacher-training programmes are aligned to support science intakes.					
9	Secondary schools in Nwoya district, head teachers monitor all our teaching and learning activities in this school.					
10	Secondary schools in Nwoya district have fully equipped Laboratory for teaching STEM subjects.					

Theme Two: Level of Students' Academic Performance in Secondary Schools in Nwoya District.

	Statements on the Level of Student's Academic Performance	SA	A	NS	D	SD
	LSAP1: Learners' Projects					
1	To what extent do you agree that learners' projects demonstrate students' ability to apply classroom knowledge in real-life contexts?					
2	How strongly do you agree that project-based learning improves students' problem-solving and critical thinking skills?					
3	To what extent do you agree that learners' projects reflect the development of creativity and innovation among students?					
4	How strongly do you agree that projects provide a reliable measure of students' overall academic performance compared to traditional tests?					

5	To what extent do you agree that supervising learners' projects enhances both teacher assessment and student self-assessment of performance?					
	LSAP2: Skills Development					
1	To what extent do you agree that students' acquisition of practical skills is a key indicator of their academic performance?					
2	How strongly do you agree that students who develop communication and presentation skills perform better academically?					
3	To what extent do you agree that teamwork and collaboration skills gained in class activities reflect students' academic progress?					
4	How strongly do you agree that critical thinking and problem-solving skills are essential measures of students' academic performance?					
5	To what extent do you agree that skill development activities (e.g., debates, projects, experiments) positively influence students' overall academic outcomes?					
	LSAP3: Practical and Active Learners' Involvement					
1	To what extent do you agree that UNEB grades accurately reflect students' mastery of subject content?					
2	How strongly do you agree that good UNEB performance is a reliable measure of students' overall academic achievement?					
3	To what extent do you agree that UNEB examination results are influenced by the teaching methods used in the classroom?					
4	How strongly do you agree that UNEB grades determine students' future academic and career opportunities?					
5	To what extent do you agree that UNEB grades provide a fair assessment of students' academic performance across different schools?					
	LSAP4: Activity of Integration Grades.	SA	A	NS	D	SD
1	To what extent do you agree that Activity of Integration Grades accurately reflect students' ability to apply knowledge across different subjects?					
2	How strongly do you agree that students who perform well in integration activities demonstrate better overall academic performance?					
3	To what extent do you agree that Activity of Integration Grades encourage learners to engage in critical thinking and problem-solving?					
4	How strongly do you agree that students' participation in integration activities positively impacts their academic outcomes in formal assessments?					
5	To what extent do you agree that Activity of Integration Grades provide a fair measure of collaborative and practical skills among students?					

Appendix D: Krejcie and Morgan Table of Sample Size Determination (1970)

N	S	N	S	N	S	N	S	N	S
10	10	10	80	280	162	800	260	2800	338
15	14	110	86	290	165	850	256	3000	341
20	19	120	92	300	169	900	269	3500	346
25	24	130	97	320	175	950	274	4000	351
30	28	140	103	340	181	1000	278	4500	354
35	32	150	108	360	186	1100	285	5000	357
40	36	160	113	380	191	1200	291	6000	361
45	40	170	118	400	196	1300	297	7000	364
50	44	180	123	420	201	1400	302	8000	367
55	48	190	127	440	205	1500	306	9000	368
60	52	200	132	460	210	1600	310	10000	370
65	56	210	136	480	214	1700	313	15000	375
70	59	220	140	500	217	1800	317	20000	377
75	63	230	144	550	226	1900	320	30000	379
80	66	240	148	600	234	2000	322	40000	380
85	70	250	152	650	242	2200	327	50000	381
90	73	260	155	700	248	2400	331	75000	382
95	76	270	159	750	254	2600	335	100000	384

Sample Size(s) required for the given Population Sizes (N)

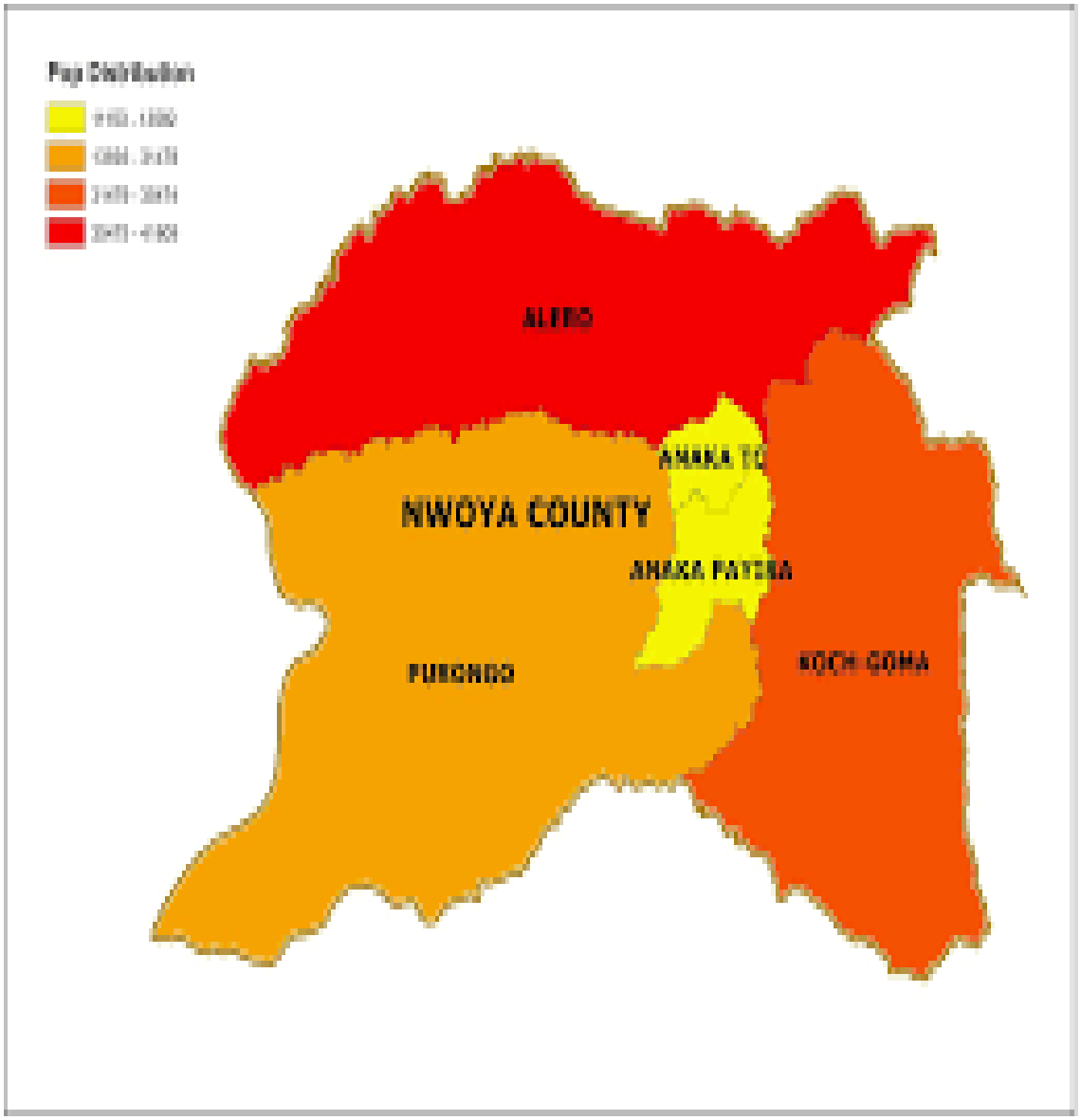
Appendix E: Proposed Work Plan for the Study

Action Steps	Responsible Person (s)	Timeline *By When? (Day/Month)*	Resources A. *Resources Available (financial, human, political & other).*
Step 1: Identification of Research Problem	Lunyjino Noah.	July 2024	A. Laptop, Time and supervisor B. Finances
Step 2: Development of Research Proposal	Lunyjino Noah.	August- December, 2024	A. Time, supervisor and Laptop B. Stationery
Step 3: proposal defense and correction	Lunyjino Noah and supervisors	June, 2025	Stationery, feeding and refreshment
Step 4: Modification of Research Tools	Supervisor/ Lunyjino Noah.	July, 2025	A. Supervisor and time B. Stationery
Step 5: Data Collection	Lunyjino Noah./ Research assistants	July, 2025	A. Schools identified and research assistants B. Stationery
Step 6: Data Organization, Analysis, Evaluation, Reporting and Submission	Supervisor and Lunyjino Noah.	August, 2025	A. Supervisor B. Data analyzer
Viva voce, corrections, submission and submission	Lunyjino Noah and supervisor	November, 2025	A. Supervisor B. Data analyzer
Publishing of two articles	Lunyjino Noah and Supervisor	December, 2025	A. Supervisor B. Lunyjino Noah.

Appendix F: Proposed Study Budget

S/N	Items	Quantity	Unit cost	Amount
1	Laptop	1	700,000	700,000
2	Internet services			100,000
3	Consultancy services for SSPS			800,000
4	Printing, photocopying and Binding	11	23000	453,000
5	Research Assistants	3	150,000	300,000
6	Printing papers	4	15000	60,000
7	Pens	12	500	6000
8	Transport costs	1	20000 *10	200,000
9	Voice recorder and Flush Disks	3	350000	440000
10	Airtime	2	10,000	20,000
11	Research assistants	2	150000	300,000
12	Proposal and report, instrument, letters	Block		200,000
13	Contingencies			200,000
14.	Publication Costs	Block	600,000=	600,000=
			Total	**3,779,000/=**

Appendix G: A Sketch Map of Nwoya District Showing the Study Area



Appendix H: Introductory Letter

GULU UNIVERSITY
P.O. BOX 166 GULU
TEL: +256471432922

OFFICE OF THE DEAN, FACULTY OF EDUCATION AND HUMANITIES

6th October 2025

TO : WHOM IT MAY CONCERN

This is to introduce to you Mr. Lunyjiino Noah (Reg No. 22/U/1567/MED/PS) a student pursuing a programme of study leading to an award Master of Education in Education Management of Gulu University, Master of Gulu University.

he is undertaking research on the Topic:

IMPLEMENTATION OF GOVERNMENT POLICY ON SCIENCE EDUCATION AND STUDENTS' ACADEMIC PERFORMANCE IN SECONDARY SCHOOLS IN NWOYA, UGANDA

Which is in partial fulfilment of the requirements for the award.

Any assistance rendered to him in relation to this research work will be highly appreciated.

GULU UNIVERSITY
08 OCT 2025
FACULTY OF EDUCATION AND HUMANITIES

Yours faithfully,

Dr. Denis Thaddeus Ofoyuru

Dean, Faculty of Education and Humanities