

POLITICAL IDEOLOGIES, STEM EDUCATION AND ECONOMIC STRATEGIES FOR NATIONAL DEVELOPMENT IN NIGERIA

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Abstract

This paper examines how political ideologies affect national economic strategies related to Science, Technology, Engineering, and Mathematics (STEM) and their role in sustainable development. As the world evolves with new technologies and industries, especially accelerated by recent global events, there is an increasing need for new skills and a strong STEM workforce. However, political beliefs influence how resources are allocated and how STEM education and innovation are supported. The current educational and economic policies, shaped by various political ideologies, often impact the effectiveness of STEM development. Issues such as inadequate support for STEM education, insufficient investment in research, and mismatched skills between the workforce and industry needs create challenges for sustainable development. These challenges include a shortage of skilled professionals in STEM fields, which can hinder progress and innovation. The paper explores how different political beliefs influence economic policies that affect STEM sectors and examines the implications for national development. It discusses how aligning political ideologies with strategic economic goals can enhance STEM contributions to sustainable growth. The analysis also offers recommendations for improving the connection between political decisions and STEM advancements to support long-term development.

Keywords: Political Ideology, National Economy, STEM Education, Sustainable Development, Innovation

Introduction

Political ideologies serve as the foundation upon which nations build their economic strategies, particularly in sectors that drive innovation and development, such as Science, Technology, Engineering, and Mathematics (STEM). The interplay between political thought and economic policy is not merely academic; it has tangible effects on how governments prioritize resources, structure educational systems, and encourage technological advancements (White, 2017). For instance, liberal democracies often emphasize a market-driven approach, where the private sector is seen as the primary engine for innovation and economic growth. This perspective advocates for minimal government intervention, encouraging competition and entrepreneurship as catalysts for advancements in STEM fields. In contrast, socialist-oriented states may prioritize state intervention, focusing on equitable access to STEM education and centralized planning to ensure that technological progress benefits all segments of society (Kelly, 2021).

The importance of STEM in national economic strategies is increasingly acknowledged, particularly in the context of the United Nations' Sustainable Development

Goals (SDGs). STEM is not just a driver of economic growth; it is a crucial tool for addressing global challenges such as climate change, energy sustainability, and social inequalities. The political ideologies guiding national policies play a pivotal role in determining how STEM is integrated into broader economic strategies. For example, countries with strong environmentalist ideologies may prioritize STEM initiatives that focus on renewable energy and green technologies, aligning their economic strategies with goals for environmental sustainability (Johnson, 2020). On the other hand, nations with more conservative or growth-oriented ideologies might focus on industrial STEM applications that prioritize economic expansion, sometimes at the expense of environmental concerns (Turner, 2022).

Investment in STEM education is another critical area where political ideologies come into play. Nations with a focus on equity and social justice may implement policies that ensure widespread access to STEM education, particularly for underrepresented and marginalized groups. This can help to build a more inclusive workforce, driving innovation from a diverse base of talent. In contrast, countries that prioritize economic efficiency might focus their investment in STEM education on elite institutions, believing that concentrating resources on the most talented individuals will yield the highest returns. Both approaches have implications for national development, as they influence the breadth and depth of a country's STEM capabilities (Ruiz, 2021).

Moreover, political ideologies shape international collaborations in STEM, which are increasingly important in a globalized world. Countries with an internationalist perspective may seek to build partnerships and share knowledge across borders, viewing STEM as a collective tool for addressing global challenges. Conversely, more nationalist ideologies might prioritize domestic STEM development, aiming to achieve self-sufficiency and protect intellectual property from foreign competition. These differing approaches can impact the global distribution of technological advancements and the overall progress toward achieving the SDGs (Lopez & Patel, 2022).

Understanding the impact of political ideologies on national economic strategies is therefore crucial for policymakers, educators, and researchers. It is not merely about recognizing the ideological underpinnings of existing policies but also about anticipating how these ideologies will shape future developments in STEM and their contributions to sustainable development.

National: National, according to Longman active study dictionary is a concept that refers to the whole part of a nation. That is, it embraces all aspect of a country.

Development: Development is the qualitative and quantitative changes that occur in the life of the citizens of a nation. Its relevance to the growth and stability of a country is equal to none. Development is the bedrock to achieving national development and it pervades all aspect of the society. Development, according to Gboyega (2003) is an idea that embodies every attempt to improve the condition of human existence in all ramifications. Such improvement could only be done when the educational and economic status of the people are given due attention. Naomi (1995) also referred to it as the economic growth, equitable distribution of health care, education, housing and other essential services Knowledge Review Volume 28 No. 2,

December, 2013, that could assist in improving individual and collective quality of life. In this regard, this study focuses on the educational and economic aspect of growth because they have major impact on other areas of the societal life of the people.

National Development; National development involves the entire social, economic, political as well as religious stability of a given nation. Some of the challenges that bedevils national development as highlighted by Lawal and Abe (2011) includes lack of executive capacity responsible for the formulation and implementation of national plans, lack of good governance, high level of corruption and indiscipline and the mono-economic base of the country. Other factors could be unstable educational policies, lack of adequate support for (STEM) education. These factors combined to fetter Nigeria national development hence it continued to function as one of the underdeveloped nation in Africa.

Political Ideologies: Political ideologies refer to coherent sets of beliefs, values, and ideas that guide the behaviour of individuals, groups, and governments in the organization of society and governance. Ideologies influence how power is distributed, how resources are allocated, and how social, economic, and political structures are established. Major political ideologies include liberalism, conservatism, socialism, and environmentalism, among others. Liberalism, for example, emphasizes individual freedom, market-driven economies, and limited government intervention, advocating for policies that promote free trade and innovation through private enterprise (Heywood, 2017). Conversely, socialism focuses on collective ownership, state intervention in the economy, and the redistribution of resources to achieve social equity (Ollman, 2019). Environmentalism, often considered a newer ideology, emphasizes the importance of ecological sustainability and advocates for policies that protect natural resources and address climate change (Carter, 2021).

The influence of political ideologies extends to the formulation of national economic strategies, shaping decisions on investment, regulation, and the prioritization of certain sectors. In this study, political ideologies are examined for their role in directing national strategies related to STEM development and sustainable development. Understanding these ideological frameworks is crucial for analyzing how different governments approach the challenges and opportunities associated with advancing STEM education and technologies in pursuit of long-term sustainability.

National Economic Strategies: National economic strategies encompass the plans, policies, and actions that governments employ to manage and develop their economies. These strategies are often designed to achieve specific goals such as economic growth, job creation, technological advancement, and social equity. Economic strategies are deeply influenced by the political ideologies that dominate a nation's governance, as these ideologies shape the priorities, methods, and outcomes of economic policy (Stiglitz, 2019). For instance, a liberal economic strategy might prioritize deregulation, privatization, and the promotion of free markets as mechanisms to stimulate innovation and economic growth (Friedman, 2022). In contrast, a socialist economic strategy might emphasize state ownership of key industries, extensive social welfare programs, and centralized economic planning to achieve social justice and reduce inequality (Ollman, 2019).

STEM (Science, Technology, Engineering, and Mathematics): STEM is an interdisciplinary approach to education and innovation that integrates the fields of science, technology, engineering, and mathematics. STEM is recognized as a critical driver of economic

growth, technological advancement, and societal progress, as it equips individuals with the knowledge and skills needed to solve complex global challenges (National Research Council, 2019). The importance of STEM has been increasingly acknowledged in national and international policy frameworks, particularly in the context of the Fourth Industrial Revolution, which is characterized by the fusion of digital, physical, and biological systems (Schwab, 2016). Countries that invest heavily in STEM education and research are often at the forefront of technological innovation, leading to enhanced economic competitiveness and improved quality of life for their citizens. (STEM) education is the teaching and learning of all the themes that constitute (STEM) in the primary, secondary or tertiary institution. The knowledge of Science imparted to children of school age could mark the beginning of technological spread that could give birth to national development if earnestly implemented. Globally, according to Anigala (2019), Science had gained an indisputable importance because it is a recurrent denominator in all scientific researches. Its relevance was also attested to by Agugah (2015) when he noted that Science occupies a unique position in the scientific attempt at globalization through information and communication management. As significant as this phenomenon in enhancing economic, sociopolitical and other pre-requisites of national development, its pride of place have not been given full recognition hence the government has found it very difficult to satisfy her citizens and socio- vices have taken its toll on the people. The main component of a comprehensive frame work that constitutes (STEM) education as stated by Aniefiok and Imeh (2013) includes the learner, teacher, instructional method, materials, media activities and organization for instructions. The indices highlighted above have been sparingly attended to and as a result, national development assumes the mode of slow development.

However, the development and promotion of STEM are significantly influenced by the political ideologies that guide national policy. For example, a government with a strong liberal ideology might prioritize STEM initiatives that encourage private sector innovation and entrepreneurship, providing incentives for companies to invest in research and development (Mazzucato, 2018). In contrast, a government with a socialist orientation might focus on ensuring equitable access to STEM education across all social groups, implementing policies that aim to reduce disparities in educational attainment and workforce participation (Freire, 2020). This study examines how different political ideologies shape national strategies for advancing STEM and how these strategies contribute to sustainable development.

Sustainable Development: Sustainable development is a holistic approach to growth and progress that seeks to meet the needs of the present without compromising the ability of future generations to meet their own needs. It is underpinned by three interconnected pillars: economic development, social inclusion, and environmental sustainability (United Nations, 2015). The concept of sustainable development emerged in response to growing concerns about the environmental and social impacts of rapid economic growth, particularly in the context of industrialization and globalization (Meadows et al., 1972). The United Nations' Sustainable Development Goals (SDGs), adopted in 2015, provide a global framework for achieving sustainable development by addressing issues such as poverty, inequality, climate change, and environmental degradation (United Nations, 2015).

Sustainable development is closely linked to STEM, as advancements in science, technology, engineering, and mathematics are essential for addressing many of the challenges outlined in the SDGs. For example, innovations in renewable energy technologies are crucial for

transitioning to a low-carbon economy, while advancements in agricultural science are necessary to ensure food security in a changing climate (Rockström et al., 2017). However, the extent to which STEM can contribute to sustainable development depends on the political ideologies that shape national policies. Governments with a strong commitment to environmental sustainability may prioritize STEM initiatives that focus on green technologies and conservation efforts, while those with a growth-oriented focus may emphasize industrial applications of STEM that drive economic expansion (Carter, 2021).

Factors Affecting (STEM) Education:

The challenges facing (STEM) education in Nigeria is not peculiar to it, it is rather a reoccurring decimal that cuts across performance in academics generally that have affected Nigeria economy on the long run. Some of the factors affecting STEM education were highlighted by some researchers to include: Awolola (2018) identified poor study habit to be responsible for lack of attention, perseverance, day-dreaming, worry, anxiety, and negative feelings toward the study of Science. Performance of students in Science, attitudes towards Science achievement, sex differences in Science and the complexity of preparing STEM teachers (Lassa, 2014), inability to incorporate new development in science and technology into Mathematic education, lack of acceleration of programs for the continued professional development of teachers, inability of STEM educators to find new assessment instruments that reflect the new expectation of STEM education, un-conducive environment and lack of manipulative measuring devices such as calculators, computers and others (Aguale & Usman, 2017).

Other factors include:

1. Science, Technology, Engineering & Mathematics is excessively involved in figures and symbols.
2. It is very abstract in nature.
3. Lack of qualified STEM teachers in schools.
4. Carry-over beliefs that STEM is too difficult.
5. Faulty teaching methods.
6. Inadequate STEM teaching aids and materials.
7. Lack of STEM text books.

Science, Technology, Engineering, & Mathematics (STEM) Education and Sustainable Development

Science is the core of science and technology which every country need to improve its human, material and natural resources. Where Mathematic education is already faulty, the nation is faced with reduction in both scientific and technological input and output (production). Science is embedded in these two forces of development and it is the chief ingredients that make insignificant the great terrors given birth to by cruelty, oppression and civil war, kidnapping which are products of unemployment (Salman; Olawoye & Yahaya, 2013). People resort to this negative vices because they are not empowered to be creative and productive which could be traceable to faulty foundation in STEM that give birth to poor development. Science plays a very important role in the implementation and use of science in Nigeria. Emphasis should therefore be laid on its popularity in other to facilitate its teaching and learning process at the primary, secondary and tertiary levels of education so as to boost national development. The

essence of this, according to Odeyemi (2018), is to ensure that the knowledge of Science is properly imparted in students to enhance science education and its organization in a way that it will be possible to feed, clothe and house the whole Nigerian population not luxuriously, but sufficiently to prevent great suffering, combat disease and make chronic ill-health rare. In other words, according to him, it will be possible to prevent the increase of population from outrunning food supply. Education, therefore, constitutes the major focus as it could be used for economic growth. STEM education forms the basis of Nigerian education. Its challenges pose further economic threat to any developing nation. These challenges according to Salman; Olawoye & Yahaya (2013) have led to different reforms at various levels of education. The reforms are however, meant to improve the lives of the people that they might become self-reliant.

Conclusion

In conclusion, this paper highlights the significant influence of political ideologies on national economic strategies, particularly in the context of advancing STEM and promoting sustainable development. The study reveals that different ideological frameworks shape how nations prioritize and implement STEM initiatives, which in turn affects their ability to achieve long-term sustainability goals. Understanding these ideological influences is crucial for policymakers and researchers as they design strategies that effectively leverage STEM for economic growth and sustainable development. Moving forward, aligning political ideologies with global sustainability objectives will be essential for addressing the complex challenges of the 21st century.

Recommendations

Based on the findings of this study, several key recommendations can be made to enhance the alignment of national economic strategies with the goals of advancing STEM and promoting sustainable development:

1. Integrate ideological flexibility into policy-making by combining elements from various political ideologies to create balanced economic strategies.
2. Prioritize STEM education and research in national agendas, with increased investment, especially in underrepresented communities.
3. Promote public-private partnerships to drive sustainable innovation while ensuring alignment with national and global sustainability goals.
4. Implement robust regulatory frameworks that guide technological development in accordance with sustainable development principles.
5. Align national economic strategies with global sustainability frameworks, such as the United Nations' Sustainable Development Goals (SDGs).

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