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Beyond Stem-Driven Rote Learning: Infusing Tagore's Philosophy of Creativity and Nature into Nigerian Education

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Abstract

Nigeria's educational system is gravely STEM-driven, with the Arts and Humanities being relegated to the background, while rote memorization, science-based learning, examination-oriented teaching and learning are upheld. This overt emphasis on STEM has narrowed the scope of education neglecting creativity, emotional intelligence, and cultural development. This paper draws on Rabindranath Tagore's philosophy of holistic education, which emphasizes creativity, artistic expression, and harmony with nature, to propose a more balanced and human-centered approach to education in Nigeria. By contrasting Nigeria's STEM-dependent, exam-focused methodology with Tagore's vision of integrating arts, music, and experiential outdoor learning, the paper projects the urgent need to restore the Arts and Humanities to their rightful place within the curriculum. It argues that such reforms would not only enhance innovation and critical thinking but also enhance students' emotional well-being, environmental awareness, and cultural identity. The paper ends by purporting that infusing Tagorean principles into Nigerian education would not only prepare learners for the demands of the 21st century but would also aid in ensuring the wholesome growth of learners.

Keywords: Holistic Education, Rote Learning, Creativity, Arts and Humanities, Nigerian Curriculum

INTRODUCTION

Nigeria's educational system has become increasingly dominated by Science, Technology, Engineering, and Mathematics (STEM) disciplines in recent times. While STEM education is vital for national growth, its prioritization has come at a cost – the

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relegation of the Arts and Humanities to the background, and the enablement of rote memorization during learning. This systemic imbalance has produced learners who are keen on passing examinations and so resort to reproducing facts while ignoring creativity, emotional intelligence, and the holistic skills required to succeed in a dynamic, knowledge-driven society. The overt emphasis on STEM, coupled with exam-oriented teaching methodology, narrows the purpose of education to the obtainment of credentials rather than personal growth or social transformation.

This article argues that the philosophy of Rabindranath Tagore proffers a compelling correction to the status quo. Tagore saw education as a holistic process that inculcates creativity and harmony with nature while developing the whole person - intellectually, emotionally, and spiritually. His emphasis on artistic expression, experiential learning, and environmental awareness serves as an alternative lens through which Nigeria's educational framework can be reimagined.

The purpose of this article is therefore threefold: first, to analyse the effect of Nigeria's STEM-laden and rote-dependent educational system; second, to explore Tagore's philosophy as a model for holistic and creative methodology; and third, to propose how the Nigerian educational system can be repositioned to integrate creativity, arts, and nature into the curriculum.

The central argument is that infusing Tagorean principles into Nigeria's education system can counterbalance STEM dominance, reduce rote dependency, and breed innovation, cultural awareness, and holistic growth. To address this argument, the article considers three guiding questions:

1) What are the limitations of Nigeria's current STEM-heavy, rote-based model?
2) How does Tagore's philosophy of creativity and nature serve as a viable alternative?
3) What practical reforms could Nigeria adopt to realign its educational system with broad(er) development?

LITERATURE REVIEW

o Tagore's Educational Philosophy

Rabindranath Tagore pictured education as an all-encompassing process that feeds the intellectual, emotional, spiritual, and aesthetic capacities of students/learners. He believed learning should take place in the open with learners having access to interact with nature and that creative expression such

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as art, music, drama, and do-it-yourself activities should be engaged in while learning. At Santiniketan in Tagore's time, students attended open-air classes, engaged with nature, and followed an interdisciplinary curriculum that had a mixture of culture and global perspectives (Visva-Bharati, n.d.). Tagore stressed that learning through activity was more real than through the written word. He advocated for the use of mother-tongue during teaching and emphasised the upholding of cultural identity and universal human values (Tagore, 2008).

o **Rote Learning and STEM Bias in Nigeria**

Empirical studies in Nigeria lays bare the limitedness of rote-based teaching methodology. Adadu, Ogbiji, and Agba (2017) compared the typical rote learning method with mnemonic methods in teaching physical geography and found that combining mnemonics with rote teaching techniques significantly improved students' achievement, suggesting that the rote method alone is less effective. Meanwhile, the broader educational policy shows a strong national emphasis on STEM education which is a good developmental priority—but one that inadvertently puts aside the Arts and Humanities in curriculum and resource allocation (UNESCO, 2024a). While the emphasis on STEM goes in consonance with Nigeria's aspirations for global competitiveness, it also admits of examination-oriented teaching and instils the perpetual neglect of creativity and critical thinking which ought not to be so.

o **Benefits of Arts and Experiential Learning**

Evidence from international circles allude to the scholastic and developmental benefits of arts and experiential education. Reports from the United National Educational, Scientific and Cultural Organization (UNESCO, 2023) reveal that Arts Education contributes to improvements in Mathematics, Writing, Reading, creativity, engagement, attendance, perseverance, as well as classroom behaviour. Comparably, the UNESCO (2024b) accentuates how Arts Education births empathy, sustainability; cultural existence, and peace-building - outcomes that build upon STEM competencies. Furthermore, UNESCO (2024c) proffers teacher-focused guidelines for infusing the arts into teaching as a track road to transformative student learning across different environments. These findings aver

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that creative and experiential learning approaches do not make educational achievements lax but rather enhance it as it equips learners with the emotional resilience and innovative capacities needed for navigating contemporary challenges. The literature above shows a clear theoretical fit between Tagore's all-encompassing model and the latest calls for more balanced curricula. While Nigerian policy duly values STEM for national development, empirical and international evidence indicates that excluding arts-based, nature-connected instructions would be at the expense of producing graduates with strong technical knowledge but limited creative capacities, emotional resilience, and cultural rootedness. There is therefore a strong rationale—both normative and evidence-based—for pitching the Tagorean-induced method of teaching methodology in order to complements to Nigeria's STEM focused educational system.

CONCEPTUAL LENS

The conceptual lens for this paper is ingrained in the idea of holistic education, which views learning as the nourishing of the total being - intellectually, emotionally, socially, morally, and creatively. Holistic education is a philosophy which emphasizes the development of the whole person rather than reducing learning to the mere transmission of information or preparation for examinations. Ron Miller (1990) describes holistic education as "an approach of learning in which students are made to engage in the full range of human experience," while Nel Noddings (2005) buttresses care, empathy, and the nurturing of relationships as core to educational practice. In this methodology, learning is seen as a procedure of self-actualization and realization, making meaning out of something, a situation, and connecting with the larger world, other than a narrow method of being proficient in prescribed content.

Tagore's educational vision fits ideally into the philosophical tradition of holistic education. His insistence on *creativity through the arts* is in sync with holistic education's call to the cultivation of imaginative and divergent thinking as crucial for flourishing of the human (Tagore, 2008). His principle of *learning through activity and experience* aligns with John Dewey's (1938) experiential learning model which upholds the idea that useful knowledge comes from direct engagement rather than rote memorization. Moreover, his integration of

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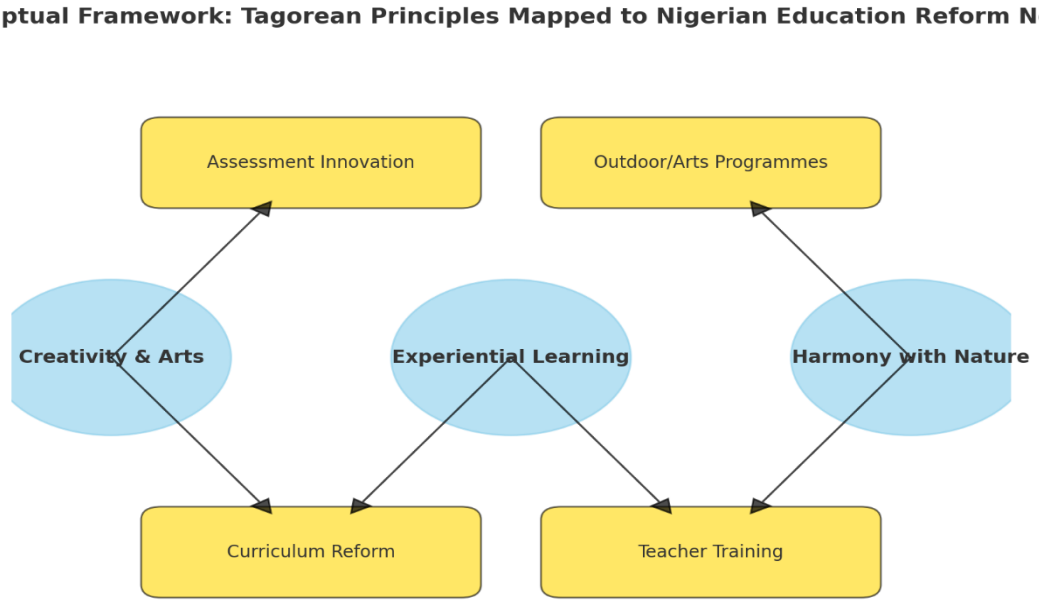
nature as a living classroom foresees modern environmental teaching, highlighting education's responsibility to engender environmental awareness and ethical responsibility toward the planet (Visva-Bharati, n.d.).

Applied to the Nigerian context, this conceptual lens exposes the limitations of a STEM-driven educational system that gives advantages to technical knowledge and standardized testing while setting aside the Arts and Humanities. The Nigerian system, is at a risk of downplaying creativity and environmental stewardship while producing technically skilled graduates. Thus, infusing Tagorean principles into Nigerian education would aid enrich STEM competencies with holistic dimensions, equipping learners to not only compete globally but also to succeed as balanced, innovative, and socially responsible citizens.

Figure 1

Conceptual framework: Tagorean principles mapped to Nigerian education reform needs



METHODOLOGY

This study uses a qualitative, conceptual, and comparative research methodology, which is

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suitable for philosophical, educational, and policy-oriented inquiry where the aim is theoretical understanding and normative evaluation rather than empirical measurement (Miller, 1990; Noddings, 2005). Conceptual research aids in the systematic examination of ideas, frameworks, and assumptions which are basic to educational practices and policies, particularly in situations where values, meaning, and human development are primary concerns.

The study's primary data are documentary and literature-based sources which include:

(1) Philosophical texts by Rabindranath Tagore that articulate his vision of holistic, creative, and nature-centered education (Tagore, 2008),

(2) National and international education policy documents, including Nigeria's National Policy on Education (Federal Republic of Nigeria, 2013) and universal frameworks on Arts and holistic education produced by UNESCO (UNESCO, 2023); and

A(3) Peer-reviewed scholarly literature addressing STEM education, rote learning, Arts Education, experiential learning, and holistic methodology within Nigerian and international contexts (Adadu et al., 2017; Moland, 2017; Nussbaum, 2010).

The study proceeds methodologically in three connected stages. First, a conceptual analysis is done to clarify the meaning and core principles of holistic education, taking a cue from Tagore's philosophy and complementary educational theorists such as Dewey, Miller, and Noddings (Dewey, 1938; Miller, 1990; Noddings, 2005). This stage sets up the theoretical lens through which the Nigerian educational system is examined.

Second, a comparative analytical approach is used to distinguish between Nigeria's STEM-driven, examination-oriented educational model and Tagore's Arts-integrated and experiential vision of education. Comparative analysis is particularly important in educational research as it is used in identifying structural tensions, ideological assumptions, and alternative possibilities within policy and practice (Nussbaum, 2010; UNESCO, 2023).

Third, an interpretive synthesis of empirical studies and policy reports is carried out to decipher repitutive patterns related to rote learning, creativity, student engagement, and holistic development. This synthesis enables the study to draw reasoned conclusions about

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the limitations of Nigeria's current educational approach and the potential contributions of Tagorean principles towards curriculum reform.

This qualitative and conceptual methodology is fitting because the study set out to generate theoretical insight, critical reflection, and policy-relevant recommendations, rather than statistical generalizations. By placing the analysis in established scholarship and policy texts, the study ensures analytical rigor, coherence, and relevance to contemporary educational discourse.

RESULTS AND FINDINGS

The analysis presented several key findings concerning the structure of Nigeria's educational system and the relevance of Tagore's holistic philosophy as a reformative framework. These findings are presented thematically as shown below.

Finding 1: Structural Dominance of STEM Corroborates Rote Learning Practices

The study finds that Nigeria's educational system is structurally influenced by STEM disciplines, with academic success largely measured through high-stakes, examination-based valuation. This structure strongly heightens and increases rote memorization and surface learning, as teachers and students pay attention to the reproduction of factual content order than conceptual understanding, inquiry, or creativity. Empirical studies within the Nigerian context reveal that rote-based teaching methods, when used in isolation, puts a check on meaningful learning and student achievement (Adadu et al., 2017; Moland, 2017).

Although STEM education is advanced as important for national development and universal competitiveness, its examination-driven implementation has unintentionally marginalized the Arts and Humanities and hindered the wider aims of education (Federal Republic of Nigeria, 2013; UNESCO, 2023).

Finding 2: Rote-Oriented Methodology Constrains Holistic Student Development

Closely linked to STEM dominance is the frequency of the use of teacher-centered, rote-oriented teaching methods. The findings indicate that such methods of teaching impede on opportunities for creativity, emotional growth, cultural expression, and ethical reflection. Students trained solely for success in examinations are not likely to develop their imagination, empathy, and critical thinking abilities and these are

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foremost in holistic education and democratic citizenship (Nussbaum, 2010; Noddings, 2005).

The use of deficient teaching methodology lines up with what Dewey (1938) criticized as mechanical learning which is detached from real life experience, thereby eating away at education's potential to bring about personal meaning and social responsibility.

Finding 3: Tagore's Holistic Philosophy Provides a Coherent Alternative Framework

The study finds that Rabindranath Tagore's philosophy of education proffers a coherent and contextually relevant alternative to rote-driven schooling. Tagore's emphasis on learning through experience, artistic expression, rootedness in culture, and harmony with nature ensures the development of the whole person intellectually, emotionally, and creatively (Tagore, 2008).

His rejection of mechanical memorization and endorsement of activity-based learning strongly agrees with contemporary holistic and experiential education theories (Dewey, 1938; Miller, 1990). This alignment opines that Tagore's philosophy is both historically and methodologically relevant for addressing current educational challenges in Nigeria.

Finding 4: Arts and Experiential Learning Ensures Better STEM Learning Outcomes

Evidence from international and policy literature shows that Arts-based and experiential learning methods strengthen STEM education. Arts education has been proven to enhance student engagement, understanding of concepts, creativity, and socio-emotional skills - which supplement scientific and technical learning (UNESCO, 2023).

The findings indicate that embedding artistic and experiential methods into STEM instruction deepens understanding in students as it helps learners to connect abstract concepts to real life experiences, thus promoting innovation and sustained learning.

Finding 5: Policy and Assessment Structures Remain Major Barriers to Holistic Reform

Despite the rising awareness and the use of the STEAM model of learning which integrate Arts and experiential learning in the learning of STEM-based subjects in some institutions, the study finds that policy frameworks and evaluation systems are potent barriers to holistic reform in the

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Nigerian educational sector. The placement of priority on STEM-based subjects in curriculum development and funds allocation, high emphasis on memorization-based assessment, continue to hinder the institutionalization of creative and holistic teaching methodologies (Federal Republic of Nigeria, 2013; UNESCO, 2023).

Without reforms that legitimize Arts education, experiential learning, and project-based assessment, attempts at implementing Tagorean principles are likely to be marginal and not systemic**.**

COMPARATIVE ANALYSIS/DISCUSSION

o **Nigeria's STEM-driven and rote-oriented system**

Recent educational policy documents and educational programs executed in Nigeria privileges STEM and places it as core to the nation's national development (Federal Republic of Nigeria, 2013). Although investment in STEM is important for economic competitiveness and classroom research documents, continuous, teacher-centered, rote-learning practices that favour memorization for high-stakes examinations rather than inquiry or creativity is to a degree unproductive (Moland, 2017). Such teaching methodology and practice tends to produce surface learning and serves as a drawback to students as it keeps them from opportunities for exploration, problem solving, and divergent thinking which are needed in the complex world we live in (Moland, 2017; Ilemobayo, 2025).

While policy documents usually admit the importance of a balanced curriculum, Nigerian policymakers continue to privilege STEM over the Arts due to a perceived ranking of prestige and economic profitability when it comes to STEM; Sciences are often associated with modernization and employability, whereas the Arts and Humanities are usually dismissed as "dispensable" or "soft" subjects. This logic has streamlined policy priorities, sidelining creative disciplines despite evidence of their role in bringing about innovation, cultural identity, and critical citizenship. Unless this bias in terms of ranking between the Science, Arts and Humanities is addressed, educational reforms will continue to reproduce an unequal curriculum that foils holistic education.

o **Tagore's holistic vision in practice**

Rabindranath Tagore's teaching methods at Santiniketan typify a curriculum designed to

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admit of arts, nature, and experiential learning. In his teaching methodology, creative expression and outdoor engagement are core to intellectual formation (Visva-Bharati, n.d.; Jala, 1961). Tagore outrightly criticized mechanical memorization and encouraged learning through activity, arts, and cultural rootedness - a combinative model that encourages the use of imagination alongside cognitive senses (Tagore, 1929/2006).

o **Key tensions: structure, space, and assessment**

Three tensions separate Nigeria's prevailing model from Tagore's ideals.

First, structural priority: the foregrounding of STEM while marginalizing the Arts and Humanities in status and funds allocation by educational planners and examination bodies is worthy of mention (Federal Republic of Nigeria, 2013; WAEC, 2020).

Second, physical environment: Tagore's open-air classrooms entail green, flexible learning spaces; many Nigerian schools located in the urban areas lack such outdoor learning environments, thereby restricting experiential learning (Adu, Olatundun, & Oshatiti, 2014; Okoro, 2024).

Third, assessment mechanisms: summative, high-stakes testing favours rote methods of teaching and learning over creative ones; it is a reward structure which is at odds with arts-infused teaching method and project-based learning (Moland, 2017; UNESCO, 2023).

Consider a typical Nigerian chemistry classroom situation were preparing students for the WAEC examination entails the teacher writing the periodic table on the board and instructing students to memorize it for an upcoming test. The classroom is silent except for the periodic recitation of atomic numbers. Knowledge here is reduced to recollection with minimal students' engagement.

In contrast, a Tagorean-inspired approach though retaining the scientific rigor would do so while framing it through creative and experiential means. Students could conduct a simple chemical reaction in the schoolyard, observing changes directly. They could then be asked to sketch or dramatize the reaction, or compose a short poem capturing the transformation. In this way, STEM content is strengthened through art and experience thereby deepening understanding, stimulating the imagination, and nurturing intellectual and emotional growth.

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- **Emerging opportunities and illustrative cases**

Despite the challenges sited above on STEM-dependence, there are pockets of innovation that illustrate possible pathways for the infusion of STEM and the Arts and Humanities. Lagos-based initiatives and after-school Science, Technology, Engineering, Arts and Mathematics (STEAM) programs have created hands-on learning experiences that entirely incorporate arts and design thinking, suggesting that STEM and the Arts can be effectively combined (Salau, 2021; STEAM Club Nigeria, n.d.). Research works on outdoor environmental education in Nigeria show positive effects on pupils' environmental knowledge and attitudes (Adu et al., 2014), while teacher-training pilots in experiential teaching methods report improved classroom engagement and learning outcomes (Okoro, 2024). UNESCO's global frameworks further support the claim that Arts Education has the ability to produce outcomes that complement STEM goals as it fortifies creativity, socio-emotional skills, and ensures sustainable citizenship (UNESCO, 2023; UNESCO, 2024).

- **Toward a balanced model: policy and practice implications**

Integrating Tagorean principles does not mean tunning down on the attention given to STEM; rather, it means repositioning the Arts and experiential learning to the position of co-equal contributors to 21st-century skills. In order to do this certain practical policy steps should be taken such as revising curricular to uphold arts and outdoor learning hours; monitoring STEAM models that embed arts into the teaching of STEM; re-training teachers in arts-based, inquiry methods; and ameliorating assessment to admit of performance and project-based evaluation (Federal Republic of Nigeria, 2013; UNESCO, 2023). Such ameliorations would position Nigeria's development objectives with a more holistic education that breeds creativity, cultural rootedness, ecological awareness, and technical skill which equips and prepares student to be both innovative problem-solvers and socially responsible citizens.

The hazards of maintaining the current system are deep. A curriculum that lays emphasis on rote memorization and STEM alone faces the hazard of churning out graduates who are literate technically but are

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destitute creatively. Without exposure to the Arts and experiential learning, students may have difficulty adjusting to the universal changes in education that increasingly reward creativity, empathy, and inter-disciplinary problem-solving. Apart from the economic implications of the overt dependence on STEM and rote memorization, the erosion of the culture of the people can set in, separating Nigerian students from their artistic heritage as ecological apathy deepen. These long-term costs are the reasons why there is the need to embrace the holistic, Tagorean principles when thinking about national education rectification.

The key distinctions between Nigeria's current model and Tagore's holistic philosophy are summarized in Table 1 below:

Table 1

Comparative Table: Nigeria's STEM/Rote Model vs. Tagore's Holistic Model

Dimension	Nigeria's STEM/Rote Model	Tagore's Holistic Model
Curriculum	Deeply STEM-oriented; Arts marginalized	Balanced: STEM + Arts + cultural education
Methodology	Teacher-centred; rote memorization	Experiential, inquiry-based, activity-driven
Role of Nature	Limited integration of outdoor learning	Nature as a living classroom; outdoor learning central
Arts & Humanities	Often considered optional or extracurricular	Core part of learning: music, drama, literature, art
Assessment Approach	High-stakes exams; recollection-driven	Project-based, performance, and reflective evaluation
Student Development	Emphasis on technical knowledge; underdeveloped creativity	Whole-person growth: creativity, empathy, ecological awareness

POLICY AND PEDAGOGICAL RECOMMENDATIONS

For Nigeria to go beyond rote memorization and STEM-dependence and uphold Tagore's

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philosophy of creativity and nature, there needs to be some adjustments made in the educational system both at the policy and classroom levels. One step towards the required change would be to redesign the curriculum to ensure it balances STEM with the Arts and Humanities. The National Policy on Education should be revised to mandate the integration of Music, Drama, Visual Arts, and Literature as core subjects, alongside STEM. Infusing outdoor learning modules like environmental studies conducted in school gardens or community parks would further line up practice with holistic education ideals.

Equally important is teacher training. Teacher preparation programmes should be restructured to include teaching methodologies in experiential learning, project-based assessment, and the integration of arts. In-service professional development should train teachers to design cross-disciplinary lessons under a STEAM model, where scientific inquiry is embellished with creativity and design thinking. Without such reforms, classrooms will continue to be places of passive memorization rather than active exploration, as seen in the chemistry lesson scenario sited earlier.

There is the dire need for reform of assessment. The current reliance on high-stakes examinations should be adorned with project-based evaluations, portfolios, and performance tasks that capture creativity, collaboration, and problem-solving. For example, senior secondary students could be assessed through group projects that have a mixture of science experiments and artistic representations which transforms a rote exercise into a deeper, complementary learning activity.

Trial-run of the Tagorean principles should be done. To do this, some schools should be selected to serve as STEAM hubs where Tagore-inspired curricula of the combination of arts, experiential learning, and environmental instruction are implemented. These hubs could be supervised from time to time to provide evidence for national scale-up. Partnerships with NGOs, universities, and international agencies such as UNESCO should be done to further aid in the provision of resources and ensure sustainability.

Carrying out these recommendations would modernize the Nigerian educational system and raise a generation of learners who are innovative, emotionally intelligent, and in

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tune with both their cultural heritage and ecological responsibility.

CONCLUSION

This article has argued that the Nigerian educational system, with its deep STEM-rooted bias and entrenched rote learning method of teaching, is at a risk of producing graduates who are technically skilled but creatively and emotionally underdeveloped. By employing Rabindranath Tagore's philosophy of holistic education which is anchored on creativity, experiential learning, and harmony with nature, Nigeria can reinstitute its curriculum to raise well-rounded learners. The recommendations offered here, serve as guides for practical change.

A tilt towards Tagorean principles will not dwindle STEM priorities but would instead enrich them as they (Tagorean principles) equip learners with critical thinking, empathy, and cultural awareness knowledge and skills which are essential for the 21st century. Just as a chemistry lesson can be transformed from a rote memorization of the periodic table class into a flexible experience of experimentation, art, and reflection, so too can the Nigerian education metamorphose from being a mechanistic learning to a holistic system that breeds innovation and encourages human flourishing.

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