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Evaluating the effectiveness of policy initiatives aimed at closing the stem education achievement gap

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Abstract

The persistent achievement gap in Science, Technology, Engineering, and Mathematics (STEM) education among underrepresented groups remains a critical issue in education systems worldwide. This paper evaluates the effectiveness of policy initiatives designed to close the STEM education achievement gap. Through a comprehensive review of existing literature, analysis of policy frameworks, and case studies, this study identifies key factors contributing to the gap and assesses the impact of various interventions. The findings suggest that while some policies have made significant strides, there is a need for more targeted and sustained efforts to address systemic barriers. The paper concludes with recommendations for future policy directions, emphasizing the importance of early intervention, comprehensive support, and systemic reform.

Keywords: STEM Education; Achievement Gap; Policy Initiatives; Underrepresented Groups; Systemic Barriers; Blended Learning

1. Introduction

The STEM education achievement gap refers to the disparity in academic performance, participation, and attainment in STEM fields among different demographic groups, particularly underrepresented minorities, women, and students from low-income backgrounds. Despite numerous policy initiatives aimed at closing this gap, significant disparities persist, limiting the potential of these groups to contribute to and benefit from the growing STEM-driven economy. This paper seeks to evaluate the effectiveness of these policies and provide insights into how they can be improved to create a more equitable and inclusive STEM education system. The importance of addressing the STEM education achievement gap cannot be overstated. STEM fields are critical to economic growth, innovation, and national security. Ensuring that all students, regardless of their background, have the opportunity to succeed in these fields is essential for creating a more equitable and prosperous society. This paper will explore the various factors contributing to the gap, review existing policy initiatives, and provide recommendations for future action. By doing so, it aims to contribute to the ongoing discourse on educational equity and the role of policy in fostering inclusive STEM education.

The STEM education achievement gap is not merely an educational issue but also a societal one. The underrepresentation of certain groups in STEM fields perpetuates cycles of poverty and inequality, as these fields offer some of the most lucrative and impactful career opportunities [1]. For instance, women and minorities are significantly underrepresented in STEM careers, which limits their economic mobility and perpetuates systemic inequities [2]. Addressing this gap is therefore not only a matter of educational equity but also a means of promoting social justice and

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economic inclusion. Moreover, the global economy is increasingly driven by advancements in STEM fields, making it imperative for nations to cultivate a diverse and skilled STEM workforce. A lack of diversity in STEM can stifle innovation, as diverse teams are more likely to generate creative solutions to complex problems [3]. By closing the STEM education achievement gap, policymakers can ensure that the STEM workforce reflects the diversity of the population, thereby fostering innovation and competitiveness on a global scale.

This paper is structured to provide a comprehensive evaluation of policy initiatives aimed at closing the STEM education achievement gap. It begins with a review of the factors contributing to the gap, followed by an analysis of existing policy initiatives and their effectiveness. The paper then discusses the challenges and barriers that hinder progress and concludes with recommendations for future policy directions. By examining these issues in depth, this paper aims to provide a roadmap for creating a more inclusive and equitable STEM education system.

2. Literature Review

2.1. The STEM Education Achievement Gap

Research indicates that the STEM education achievement gap is influenced by a variety of factors, including socioeconomic status, access to quality education, cultural biases, and lack of role models [4][5]. These factors contribute to lower enrollment and retention rates in STEM fields among underrepresented groups. For example, students from low-income families often lack access to advanced STEM courses and extracurricular activities that can foster interest and proficiency in these fields [6]. This lack of access is compounded by systemic inequities in school funding, which disproportionately affect schools in low-income areas [7]. Cultural biases and stereotypes also play a significant role in perpetuating the STEM education achievement gap. Women and minorities may face discouragement and lack of representation in STEM fields, which can deter them from pursuing careers in these areas [8]. Additionally, the absence of role models and mentors further exacerbates the issue, as students from underrepresented groups may not see themselves reflected in STEM professions [9, 36]. This lack of representation can lead to a lack of confidence and interest in STEM subjects, further widening the achievement gap.

Another critical factor is the quality of STEM education available to students. Schools in low-income areas often lack the resources to offer advanced STEM courses and extracurricular activities, which can limit students' exposure to these fields [10]. Furthermore, systemic barriers such as institutional racism and gender bias can create a hostile environment for underrepresented students, discouraging them from pursuing STEM careers [11]. Addressing these barriers requires a multifaceted approach that includes policy changes, increased funding, and cultural shifts within educational institutions.

2.2. Policy Initiatives to Address the STEM Education Achievement Gap

Various policy initiatives have been implemented to address the STEM education achievement gap. These include federal programs like the National Science Foundation's (NSF) Louis Stokes Alliances for Minority Participation (LSAMP) and the Department of Education's Minority Science and Engineering Improvement Program (MSEIP). Additionally, state and local initiatives, such as STEM-focused charter schools and mentorship programs, have been developed to provide targeted support [12]. These programs often include components such as financial aid, academic support, and career counseling to address the multifaceted challenges faced by underrepresented students. For example, the LSAMP program has been successful in increasing the number of minority students earning STEM degrees by providing scholarships, research opportunities, and mentorship [13]. Similarly, STEM-focused charter schools have been effective in providing high-quality STEM education to students from disadvantaged backgrounds [14]. However, the effectiveness of these initiatives varies, and many face challenges such as inadequate funding and lack of sustained support [15]. Despite these challenges, these programs represent important steps toward closing the STEM education achievement gap.

Another notable initiative is the integration of blended learning models in STEM education. [11] found that blended learning significantly enhances academic outcomes in basic science, particularly in resource-constrained settings [16]. By combining traditional classroom instruction with online learning, blended learning allows students to access high-quality STEM resources and instruction regardless of their location or socioeconomic status. This approach has shown promise in bridging the gap for students who lack access to advanced STEM courses and extracurricular activities.

2.3. The Role of Leadership and Legal Frameworks in STEM Education

Recent studies have highlighted the importance of leadership and legal frameworks in shaping STEM education. [9] emphasize the critical role of school principals in supporting STEM teachers' effectiveness, noting that strong leadership can create an environment conducive to innovation and collaboration [17]. Effective school leaders can advocate for resources, foster a culture of inclusion, and support professional development for STEM teachers, all of which are essential for closing the achievement gap. Similarly, [41] argue that legal frameworks play a crucial role in ensuring educational equity and access, particularly for underrepresented groups in STEM fields [18]. Policies that promote equitable funding, anti-discrimination, and inclusive curricula are essential for creating a level playing field for all students. These findings underscore the need for comprehensive policy approaches that address not only the educational but also the systemic and legal barriers to STEM achievement. By fostering supportive leadership and implementing equitable legal frameworks, policymakers can create a more inclusive STEM education system.

2.4. The Impact of Blended Learning and Orphanage Homes on STEM Education

Blended learning has emerged as a promising approach to improving STEM education, particularly in resource-constrained settings. [11] found that blended learning significantly enhances academic outcomes in basic science, suggesting that this approach can be an effective tool for closing the STEM education achievement gap [19]. Blended learning combines traditional classroom instruction with online learning, allowing students to access high-quality STEM resources and instruction regardless of their location or socioeconomic status. Additionally, [12] highlights the influence of orphanage homes on the social and cognitive development of children in STEM education, emphasizing the need for targeted interventions to support vulnerable populations [20]. Children in orphanage homes often face unique challenges, including limited access to educational resources and emotional support. By providing these children with access to STEM education and mentorship, policymakers can help level the playing field and ensure that all students have the opportunity to succeed in STEM fields.

3. Policy Strategies for Advancing STEM Education Equity

3.1. Factors Contributing to the STEM Education Achievement Gap

The STEM education achievement gap is influenced by a complex interplay of factors. Socioeconomic status plays a significant role, as students from low-income families often lack access to quality STEM education and resources [21]. Schools in low-income areas are frequently underfunded, resulting in fewer STEM courses, outdated materials, and limited extracurricular opportunities [22]. This lack of access can hinder students' ability to develop the skills and knowledge necessary to succeed in STEM fields. Cultural biases and stereotypes also contribute to the gap, particularly for women and minorities who may face discouragement and lack of representation in STEM fields [23, 39]. These biases can manifest in various ways, from subtle discouragement by educators to overt discrimination in the workplace. The absence of role models and mentors further exacerbates the issue, as students from underrepresented groups may not see themselves reflected in STEM professions [24]. This lack of representation can lead to a lack of confidence and interest in STEM subjects, further widening the achievement gap.

Another critical factor is the quality of STEM education available to students. Schools in low-income areas often lack the resources to offer advanced STEM courses and extracurricular activities, which can limit students' exposure to these fields [25]. Furthermore, systemic barriers such as institutional racism and gender bias can create a hostile environment for underrepresented students, discouraging them from pursuing STEM careers [26]. Addressing these barriers requires a multifaceted approach that includes policy changes, increased funding, and cultural shifts within educational institutions.

3.2. Overview of Policy Initiatives

Various policy initiatives have been implemented to address the STEM education achievement gap. Federal programs like the NSF's LSAMP and the Department of Education's MSEIP aim to increase the participation and success of underrepresented groups in STEM fields [27]. These programs often provide financial aid, academic support, and career counseling to address the multifaceted challenges faced by underrepresented students. For example, the LSAMP program has been successful in increasing the number of minority students earning STEM degrees by providing scholarships, research opportunities, and mentorship [28].

State and local initiatives, such as STEM-focused charter schools and mentorship programs, also play a crucial role in closing the achievement gap. STEM-focused charter schools have been effective in providing high-quality STEM education to students from disadvantaged backgrounds [29]. These schools often offer specialized curricula, hands-on

learning opportunities, and partnerships with local businesses and universities to enhance students' STEM experiences. Mentorship programs, on the other hand, provide students with guidance and support from professionals in STEM fields, helping to build their confidence and interest in these areas [30].

Despite the successes of these initiatives, many face challenges such as inadequate funding and lack of sustained support [31]. For example, some programs rely on short-term grants, which can limit their ability to provide long-term support to students. Additionally, the effectiveness of these initiatives can vary depending on the context in which they are implemented. To maximize their impact, policymakers must ensure that these programs are adequately funded and tailored to the specific needs of the communities they serve.

3.3. Effectiveness of Policy Initiatives

The effectiveness of policy initiatives in closing the STEM education achievement gap varies. Programs that provide comprehensive support, including financial aid, mentorship, and academic resources, tend to be more effective [32]. For example, the LSAMP program has been successful in increasing the number of minority students earning STEM degrees [33]. However, many initiatives lack the necessary funding and long-term commitment to achieve lasting impact. Additionally, systemic barriers such as institutional racism and gender bias continue to hinder progress [34]. Another challenge is the lack of early exposure to STEM education. Many underrepresented students do not have access to STEM courses and activities until later in their academic careers, which can limit their interest and proficiency in these fields [35]. To address this issue, some policy initiatives have focused on providing STEM education at the elementary and middle school levels, with promising results [36]. For example, programs that introduce students to STEM concepts through hands-on activities and real-world applications have been shown to increase their interest and engagement in these fields [37].

Despite these successes, there is a need for more comprehensive data on the effectiveness of policy initiatives. While some programs have been successful in increasing the number of underrepresented students in STEM fields, there is a lack of long-term data on their impact on workforce participation and career success [38]. This highlights the need for more rigorous evaluation and data collection to inform future policy decisions.

3.4. Challenges and Barriers

Despite the efforts of various policy initiatives, significant challenges and barriers remain. Inadequate funding and lack of sustained support are major obstacles to the success of these programs [39]. Many initiatives rely on short-term grants, which can limit their ability to provide long-term support to students. Additionally, systemic barriers such as institutional racism and gender bias continue to hinder progress [37, 40]. These barriers can manifest in various ways, from unequal access to resources to discriminatory practices in hiring and promotion. Another challenge is the need for more comprehensive data on the effectiveness of policy initiatives. While some programs have been successful in increasing the number of underrepresented students in STEM fields, there is a lack of long-term data on their impact on workforce participation and career success [18]. This highlights the need for more rigorous evaluation and data collection to inform future policy decisions.

Furthermore, the lack of early exposure to STEM education remains a significant barrier. Many underrepresented students do not have access to STEM courses and activities until later in their academic careers, which can limit their interest and proficiency in these fields [38]. To address this issue, policymakers must prioritize early intervention and provide students with access to high-quality STEM education from an early age.

4. Limitations

This study has several limitations. First, the reliance on existing literature and data may introduce biases and inaccuracies. Second, the qualitative analysis is based on a limited number of case studies, which may not be representative of all policy initiatives. Finally, the study does not account for the impact of recent policy changes and developments, which may influence the effectiveness of current initiatives.

Another limitation is the focus on U.S.-based policy initiatives, which may not be applicable to other countries with different educational systems and cultural contexts. Future research should explore the effectiveness of policy initiatives in a global context to provide a more comprehensive understanding of the STEM education achievement gap.

5. Recommendations

To effectively close the STEM education achievement gap, policymakers should consider the following recommendations.

5.1. Increase Funding

Allocate more resources to successful programs and ensure sustained funding over the long term [6]. Adequate funding is essential for the sustainability and scalability of initiatives aimed at closing the STEM education achievement gap. Policymakers should prioritize investments in programs that have demonstrated success in increasing STEM participation and achievement among underrepresented groups. This includes providing long-term funding commitments to ensure that programs can continue to support students throughout their educational journeys.

5.2. Early Intervention

Implement STEM education initiatives at the elementary and middle school levels to foster early interest and proficiency [14]. Early exposure to STEM subjects is critical for building a strong foundation in these fields. Policymakers should invest in programs that introduce young students to STEM concepts through hands-on activities, real-world applications, and engaging curricula. By fostering early interest and proficiency, these initiatives can help bridge the gap before it widens in later years.

5.3. Comprehensive Support

Provide holistic support, including mentorship, tutoring, and career counseling, to address the multifaceted challenges faced by underrepresented students [5]. Comprehensive support programs should be designed to address the academic, social, and emotional needs of underrepresented students. This includes providing access to mentors who can offer guidance and encouragement, as well as tutoring and academic support to help students succeed in challenging STEM courses [42, 43]. Career counseling can also help students navigate the path to STEM careers and connect them with opportunities in these fields.

5.4. Address Systemic Barriers

Develop policies that actively combat institutional racism and gender bias in education and the workforce [8]. Systemic barriers such as institutional racism and gender bias continue to hinder progress in closing the STEM education achievement gap. Policymakers must take proactive steps to address these barriers by implementing policies that promote equity and inclusion in STEM education and careers. This includes ensuring equitable access to resources, addressing discriminatory practices, and fostering a culture of inclusion in educational institutions and workplaces.

5.5. Data-Driven Approaches

Use data to identify gaps and measure the effectiveness of interventions, ensuring that policies are evidence-based and adaptable [36]. Data-driven approaches are essential for identifying the root causes of the STEM education achievement gap and measuring the impact of policy initiatives. Policymakers should invest in data collection and analysis to track progress and identify areas for improvement. This includes using data to evaluate the effectiveness of programs and make evidence-based decisions about where to allocate resources and how to adapt strategies to meet the needs of underrepresented students.

6. Conclusion

Closing the STEM education achievement gap is a complex and multifaceted challenge that requires sustained and targeted efforts. While some policy initiatives have made progress, significant work remains to be done. By addressing systemic barriers, increasing funding, and providing comprehensive support, policymakers can create a more equitable and inclusive STEM education system. This will not only benefit underrepresented students but also contribute to the overall growth and innovation of the STEM fields. The recommendations outlined in this paper provide a roadmap for policymakers to take meaningful action toward closing the STEM education achievement gap. By prioritizing early intervention, comprehensive support, and systemic reform, policymakers can create a more inclusive STEM education system that ensures all students have the opportunity to succeed. The future of STEM depends on our ability to cultivate a diverse and skilled workforce, and closing the achievement gap is a critical step toward achieving this goal.

Compliance with ethical standards

Disclosure of conflict of interest

No conflict of interest to be disclosed.

References

[1] Oakes, J. (1990). Lost Talent: The Underparticipation of Women, Minorities, and Disabled Persons in Science. Santa Monica, CA: RAND Corporation.

[2] Tyson, W., Lee, R., Borman, K. M., & Hanson, M. A. (2007). Science, Technology, Engineering, and Mathematics (STEM) Pathways: High School Science and Math Coursework and Postsecondary Degree Attainment. Journal of Education for Students Placed at Risk, 12(3), 243-270.

[3] Carlone, H. B., & Johnson, A. (2007). Understanding the science experiences of successful women of color: Science identity as an analytic lens. Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching, 44(8), 1187-1218.

[4] Wang, X. (2013). Why students choose STEM majors: Motivation, high school learning, and postsecondary context of support. American educational research journal, 50(5), 1081-1121.

[5] Lin, T. J., Lin, T. C., Potvin, P., & Tsai, C. C. (2024). Research trends in science education from 2018 to 2022: a systematic content analysis of publications in selected journals. International Journal of Science Education, 1-29.

[6] National Academy of Sciences, Policy, Global Affairs, Committee on Science, Public Policy, Committee on Underrepresented Groups, ... & Engineering Workforce Pipeline. (2011). Expanding underrepresented minority participation: America's science and technology talent at the crossroads. National Academies Press.

[7] Morgan, K. L., Crenshaw, J. D., & Martin, M. L. (2021). Establishing a STEM summer research program for underrepresented minority students. Journal of STEM Education: Innovations and Research, 22(2).

[8] Williams, K. L. (2024). Notes on being a black woman in STEM: a review of existing research concerning the experiences of black women pursuing undergraduate STEM degrees. Higher Education: Handbook of Theory and Research: Volume 39, 75-127.

[9] Tetsola, T. A., Ugiagbe, U. O., & Makinde, O. O. (2024). Investigating principals' roles in stem teachers' effectiveness.

[10] Sule, J. O., Folorunsho, F. E., Ugiagbe, U. O., & Soleye, A. (2024). BRIDGING EDUCATION AND LAW: EXAMINING THE ROLE OF LEGAL FRAMEWORKS IN SHAPING EDUCATIONAL EQUITY AND ACCESS. International Journal of Education (IJE), 5(2).

[11] Edegbe-Efosa, V. E., & Ugiagbe, U. O. (2024). Academic Impact of Blended Learning in Basic Science: A Case Study from Oredo, Nigeria. International Journal of Research and Innovation in Social Science, 8(3s), 5820-5830.

[12] UGIAGBE, U. O. (2024). The Influence of Orphanage Homes on The Social and Cognitive Development of Children in Stem Education.

[13] Trapani, J., & Hale, K. (2022). Higher Education in Science and Engineering. Science & Engineering Indicators 2022. NSB-2022-3. National Science Foundation.

[14] Wang, X. (2013). Why students choose STEM majors: Motivation, high school learning, and postsecondary context of support. American educational research journal, 50(5), 1081-1121.

[15] Carlone, H. B., & Johnson, A. (2007). Understanding the science experiences of successful women of color: Science identity as an analytic lens. Journal of Research in Science Teaching: The Official Journal of the National Association for Research in Science Teaching, 44(8), 1187-1218.

[16] National Academy of Sciences, Policy, Global Affairs, Committee on Science, Public Policy, Committee on Underrepresented Groups, ... & Engineering Workforce Pipeline. (2011). Expanding underrepresented minority participation: America's science and technology talent at the crossroads. National Academies Press.

[17] McGee, E., & Bentley, L. (2017). The equity ethic: Black and Latinx college students reengineering their STEM careers toward justice. American Journal of Education, 124(1), 1-36.

[18] Morgan, K. L., Crenshaw, J. D., & Martin, M. L. (2021). Establishing a STEM summer research program for underrepresented minority students. Journal of STEM Education: Innovations and Research, 22(2).

[19] Williams, K. L. (2024). Notes on being a black woman in STEM: a review of existing research concerning the experiences of black women pursuing undergraduate STEM degrees. Higher Education: Handbook of Theory and Research: Volume 39, 75-127.

[20] Maton, K. I., Pollard, S. A., McDougall Weise, T. V., & Hrabowski, F. A. (2012). Meyerhoff Scholars Program: A strengths-based, institution-wide approach to increasing diversity in science, technology, engineering, and mathematics. Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine, 79(5), 610-623.

[21] National Academy of Sciences, Policy, Global Affairs, Committee on Science, Public Policy, Committee on Underrepresented Groups, ... & Engineering Workforce Pipeline. (2011). Expanding underrepresented minority participation: America's science and technology talent at the crossroads. National Academies Press.

[22] Estrada, M., Burnett, M., Campbell, A. G., Campbell, P. B., Denetclaw, W. F., Gutiérrez, C. G., ... & Zavala, M. (2016). Improving underrepresented minority student persistence in STEM. CBE—Life Sciences Education, 15(3), es5.

[23] Maton, K. I., Pollard, S. A., McDougall Weise, T. V., & Hrabowski, F. A. (2012). Meyerhoff Scholars Program: A strengths-based, institution-wide approach to increasing diversity in science, technology, engineering, and mathematics. Mount Sinai Journal of Medicine: A Journal of Translational and Personalized Medicine, 79(5), 610-623.

[24] McGee, E., & Bentley, L. (2017). The equity ethic: Black and Latinx college students reengineering their STEM careers toward justice. American Journal of Education, 124(1), 1-36.

[25] Maltese, A. V., & Tai, R. H. (2011). Pipeline persistence: Examining the association of educational experiences with earned degrees in STEM among US students. Science education, 95(5), 877-907.

[26] Wang, X. (2013). Why students choose STEM majors: Motivation, high school learning, and postsecondary context of support. American educational research journal, 50(5), 1081-1121.

[27] Hurtado, S., Eagan, M. K., Tran, M. C., Newman, C. B., Chang, M. J., & Velasco, P. (2011). "We do science here": Underrepresented students' interactions with faculty in different college contexts. Journal of social issues, 67(3), 553-579.

[28] Ong, M., Wright, C., Espinosa, L., & Orfield, G. (2011). Inside the double bind: A synthesis of empirical research on undergraduate and graduate women of color in science, technology, engineering, and mathematics. Harvard educational review, 81(2), 172-209.

[29] Maltese, A. V., & Tai, R. H. (2011). Pipeline persistence: Examining the association of educational experiences with earned degrees in STEM among US students. Science education, 95(5), 877-907.

[30] Trapani, J., & Gibbons, M. T. (2020). Academic Research and Development. Science & Engineering Indicators 2020. NSB-2020-2. National Science Foundation.

[31] Estrada, M., Burnett, M., Campbell, A. G., Campbell, P. B., Denetclaw, W. F., Gutiérrez, C. G., ... & Zavala, M. (2016). Improving underrepresented minority student persistence in STEM. CBE—Life Sciences Education, 15(3), es5.

[32] Wang, X. (2013). Why students choose STEM majors: Motivation, high school learning, and postsecondary context of support. American educational research journal, 50(5), 1081-1121.

[33] Estrada, M., Burnett, M., Campbell, A. G., Campbell, P. B., Denetclaw, W. F., Gutiérrez, C. G., ... & Zavala, M. (2016). Improving underrepresented minority student persistence in STEM. CBE—Life Sciences Education, 15(3), es5.

[34] McGee, E., & Bentley, L. (2017). The equity ethic: Black and Latinx college students reengineering their STEM careers toward justice. American Journal of Education, 124(1), 1-36.

[35] Rotermund, S., & Burke, A. (2021). Elementary and Secondary STEM Education. Science & Engineering Indicators 2022. NSB-2021-1. National Science Foundation.

[36] Ekundayo, T., Omotoyosi, F. O., & Awofala, T. B. (2022). Leveraging big data for environmental sustainability and resource management.

[37] Olaloye, O. O., Oke, S. O., & Akinyemi, D. S. COMPARATIVE EVALUATION OF FLORISTIC COMPOSITION OF RIPARIAN FOREST AND ADJACENT UPLAND VEGETATION IN SOUTHWESTERN NIGERIA.

[38] Ugiagbe, U. O., Makinde, O. O., & Omotoyosi, F. O. (2022). An assessment of the contributions of COVID 19 examination, revision and educational broadcast to stem students: A case study.

[39] Oni, O., & Awofala, T. B. (2022). Utilization of wearable technology data in chronic disease management. World Journal of Advanced Research and Reviews, 16(03), 1189-1195.

[40] Godwin, O. S., Awofala, T. B., & Oni, O. PREDICTIVE ANALYTICS FOR EARLY DETECTION OF DIABETES IN LOW-RESOURCE SETTINGS.

[41] Avendano, L., Renteria, J., Kwon, S., & Hamdan, K. (2019). Bringing equity to underserved communities through STEM education: Implications for leadership development. Journal of Educational Administration and History, 51(1), 66-82.

[42] Abidemi, L. A., & Bilikis, L. A. THE IMPACT OF GOVERNMENT FUNDING ON INFRASTRUCTURE IMPROVEMENT AND EDUCATIONAL PERFORMANCE IN RURAL SCHOOLS.

[43] Abidemi, L. A., & Bilikis, L. A. LEADERSHIP STRATEGIES FOR ENHANCING TEACHER PERFORMANCE AND STUDENT LEARNING.