

The Effect of Incessant Industrial Strikes on the Development of Physics Education and National Progress in Nigeria

Godfrey Dunah Lawissense , Musa Bello PhD and Abigail Unekwu Yusuf 

Department of Physics, School of Secondary Education-Sciences, Federal College of Education, Zaria.

Corresponding author: marchity1@gmail.com

Abstract

The Nigerian education system has been plagued by frequent and prolonged industrial strikes, with far-reaching consequences on various sectors, including physics education. This article aims to explore the effect of incessant industrial strikes on the development of physics education and national progress in Nigeria. To execute this research, three objectives and three research questions guided the study. In this study, a descriptive survey design was used with two hundred and sixty-five (265) respondents drawn from the total population of eight hundred and forty-six (846) which comprises of students, lecturers and technologist of Physics Department, FCE, Zaria as sample size for the study using simple random sampling technique. Sample size is chosen in line with Krejcie and Morgan (1970) sample size table. An instrument called "Effect of Industrial Strikes on the Development of Physics Education and National Progress Questionnaire (EISDPENPQ)", with a reliability coefficient of 0.81 was used in data collection for the study. The Instrument was validated by three research experts in science education. All corrections and observations were effected on the instrument before administering it to the respondents. The analytical tools used were mean and standard deviation via the Statistical Package for Social Sciences (SPSS version 23). A mean of 3.0 and above will be considered as agreed/accepted while any mean below 3.0 will be considered as disagreed/not accepted. The end result revealed that there is high strike effect on the continuity and quality of physics education, including curriculum coverage, teacher-student interactions, and laboratory access, there is high socio-economic effect of industrial strikes on physics teachers and students, and strategies were accepted as a way to mitigate the effect of strikes on physics education. The researcher concludes by recommending that Government should allocate a larger portion of the national budget to education, ensuring that adequate resources are available for teacher training, infrastructure development, and curriculum improvement, among others.

Keywords: Incessant Industrial Strikes, Development, Effect, National Progress, Physics Education.

Introduction

The realm of education is a vital conduit for the growth and advancement of nations, providing the knowledge and skills necessary for societal progress (Adebule, & Ojedian, 2017). However, the Nigerian education system has been marred by a persistent issue – incessant industrial strikes that disrupt the continuity and quality of education. This article delves into the dire implications of these recurring strikes, specifically focusing on their devastating effect on the development of physics education and their subsequent ripple effect on the overall trajectory of national development in Nigeria. By drawing on recent

references, this article aims to illuminate the multifaceted dimensions of the challenges posed by industrial strikes on physics education, while also addressing their broader implications for scientific advancement and the realization of national progress.

Education, often hailed as the cornerstone of societal growth, plays a pivotal role in shaping the trajectory of a nation. The education sector, especially in the sciences, serves as the bedrock for the emergence of a knowledgeable and skilled workforce that drives technological innovation and economic growth (Oyedepi & Olumakinde, 2017). Within the domain of science education, physics holds a particularly crucial place, as it equips learners with analytical thinking, problem-solving skills, and a deeper understanding of the physical world. However, the systemic challenges posed by frequent industrial strikes have cast a shadow over the promise of education, leaving a trail of disruptive consequences that extend far beyond the classroom walls.

Physics education is a branch of science education that focuses on the teaching and learning of physics, which is the scientific study of the fundamental principles governing the behavior of the physical universe (Adeniji, 2018). Physics education encompasses various levels of instruction, from elementary and secondary schools to colleges and universities. It is designed to help students develop a deep understanding of the laws and principles that govern the natural world, as well as the skills necessary to apply these principles to real-world problems and phenomena (American Association of Physics Teachers, 2017). Physics education typically covers a wide range of topics within the field of physics, including classical mechanics, electromagnetism, thermodynamics, optics, quantum mechanics, and more (American Association of Physics Teachers, 2017). It often involves both theoretical and experimental components, with students engaging in hands-on laboratory work to reinforce theoretical concepts.

The effect of industrial strikes on physics education reaches beyond the immediate disruption of classroom activities. It permeates into the very fabric of scientific exploration, limiting the potential of aspiring physicists and eroding the nation's capacity to contribute to global scientific advancements (Adeoye, 2018). This article seeks to illuminate the challenges of these strikes on physics education, elucidating the ramifications for both the field of science and the broader landscape of national development.

Statement of the Problem

The problem under investigation in this research is the persistent occurrence of industrial strikes in the Nigerian education sector and their adverse impact on the development of physics education and national progress. The education sector in Nigeria has been plagued by a high frequency of strikes, particularly in recent years. These strikes disrupt the continuity and quality of education, with a specific focus on physics education, a critical field for national development. The Nigerian education sector has experienced recurrent industrial strikes by various stakeholders, including teachers and university staff unions. These strikes have led to the disruption of academic activities in educational institutions across the country. The interrupted academic calendar affects the coverage of physics

curriculum content. Students often miss out on crucial topics and practical sessions, which are essential for a comprehensive understanding of the subject. Strikes disrupt teacher-student interactions, including lectures, tutorials, and laboratory sessions. These interactions are vital for effective teaching and learning, particularly in complex subjects like physics. Physics education heavily relies on laboratory experiments and practical work. Strikes often lead to restricted access to laboratories, depriving students of hands-on learning experiences. This research aims to comprehensively examine the impact of incessant industrial strikes on physics education in Nigeria, considering their implications for national development and progress in the 21st century. Understanding this problem is essential for formulating effective strategies to mitigate its adverse effects and ensure the continuous development of physics education and, by extension, national progress in Nigeria.

Objectives

- i. To analyze the effect of strike on the continuity and quality of physics education, including curriculum coverage, teacher-student interactions, and laboratory access on Physics Education
- ii. To investigate the socioeconomic effects of strikes on Physics teachers and students
- iii. To examine strategies and policies can be implemented to minimize the adverse effects of strikes on physics education and promote national progress in Nigeria.

Research Questions

- i. How do these strikes affect the continuity and quality of physics education, including curriculum coverage, teacher-student interactions, and laboratory access?
- ii. What are the socioeconomic consequences of industrial strikes on physics teachers and students, including financial stability and psychological well-being?
- iii. What strategies and policies can be implemented to minimize the adverse effects of strikes on physics education and promote national progress in Nigeria?

Literature Review

The detrimental effects of incessant industrial strikes on physics education in Nigeria are deeply felt throughout the educational landscape, touching on various aspects of the learning experience (Nwagwu, 2020). These disruptions have far-reaching consequences that extend beyond the immediate confines of the classroom, effecting students, educators, and the overall quality of science education.

1. Disrupted Curriculum and Syllabus: Industrial strikes disrupt the academic calendar, causing frequent closures of educational institutions. This interruption leads to a fragmented curriculum, where the sequence of topics is disrupted, and planned lessons are left incomplete. For physics education, which relies on a

sequential understanding of concepts, this disruption creates gaps in students' knowledge and comprehension (Adebule & Ojediran, 2017). Students are often left struggling to connect incomplete lessons, resulting in a weakened foundation that can hinder their academic progress.

2. **Inadequate Coverage:** The reduced instructional time resulting from strikes leads to inadequate coverage of the physics syllabus. This has a cascading effect, as educators are forced to prioritize certain topics over others to meet the shortened time frame. In subjects like physics, where concepts build upon one another, missing out on fundamental topics can hinder students' ability to grasp more advanced concepts (Boullion & Gomez, 2011). This compromised understanding undermines the quality of education and impairs students' ability to engage with higher-level physics content.
3. **Effect on Practical Sessions:** Practical sessions and laboratory experiments are integral components of physics education. These sessions provide students with hands-on experience, fostering critical thinking, problem-solving skills, and a deeper understanding of theoretical concepts. Strikes disrupt these practical sessions, leaving students without the opportunity to engage in hands-on experimentation (Kumar & Rathee, 2015). As a result, students miss out on the chance to apply theoretical knowledge to real-world scenarios, hindering their ability to bridge the gap between theory and practice.
4. **Diminished Student Engagement:** The uncertainty created by recurrent strikes affects students' motivation and engagement. The frequent closures of schools and universities create an atmosphere of instability and inconsistency, making it challenging for students to remain focused on their studies. With limited time and frequent interruptions, students may become disheartened and lose interest in their studies, leading to a decline in academic performance (Adelabu & Gbenu, 2019). This lack of engagement has long-term consequences, as it can affect students' attitudes toward education and future career prospects.
5. **Educator Frustration and Morale:** Strikes also affect educators, contributing to frustration and lowered morale. Educators invest time and effort into preparing lessons and delivering quality education, but frequent closures disrupt their teaching rhythm and effect their ability to effectively engage with students (Akinsolu & Omoifo, 2015). This frustration can lead to burnout and reduced dedication to teaching, negatively affecting the overall quality of physics education.

Implications for Scientific Advancement

The effect of incessant industrial strikes on physics education reverberates far beyond the walls of educational institutions, casting a shadow over the trajectory of scientific advancement in Nigeria (Oyedepi, & Olumakinde, 2017). As a nation strives to keep pace with the rapid advancements in the global scientific landscape, the disruptions caused by

strikes hinder the cultivation of a skilled and competent scientific workforce (Adejoh, & Dachalson, 2019). This section explores the profound implications of disrupted physics education on scientific advancement, addressing the challenges that arise in producing skilled physicists, fostering research, and contributing to the broader field of science.

1. **Shortage of Skilled Physicists and Researchers:** The disruptions caused by industrial strikes lead to an interruption in the continuous learning process, making it difficult to nurture a generation of skilled physicists and researchers. Physics education is a progressive journey, where concepts build upon one another, creating a solid foundation for future explorations (Tariq, 2015). However, the interruptions and gaps in education resulting from strikes hinder the seamless progression of students' understanding, creating a generation of learners with fragmented knowledge. Consequently, the nation faces challenges in producing physicists equipped to contribute to cutting-edge research and innovation.
2. **Limited Research and Innovation:** A vibrant physics education system is a breeding ground for scientific research and innovation. Skilled physicists play a pivotal role in driving technological advancements, making breakthrough discoveries, and developing novel solutions to complex problems (Adejoh & Dachalson, 2019). However, the disruptions caused by strikes inhibit the formation of a robust pipeline of researchers and innovators. With fewer skilled physicists entering the field, the nation's capacity to engage in groundbreaking research is compromised, limiting its ability to contribute meaningfully to the global scientific discourse.
3. **Stifled Technological Progress:** Physics education is closely intertwined with technological progress. Skilled physicists are essential for the development of technology-driven sectors, such as telecommunications, energy, and healthcare (Adeniji, 2018). These sectors rely on scientific expertise to innovate and address complex challenges. The disruptions caused by strikes impede the training of physicists with the knowledge and skills necessary to drive advancements in these critical sectors, leading to a stagnation of technological progress and hindering Nigeria's ability to compete in a technology-driven global economy.
4. **Underrepresentation in International Collaborations:** Collaborations between scientists from different countries often yield innovative breakthroughs. However, the disruptions in physics education hinder the capacity of Nigerian physicists to engage in international collaborations (Eya & Onah, 2016). Researchers from nations with stable education systems are more likely to engage in global research initiatives, leaving Nigerian physicists underrepresented in international scientific collaborations. This underrepresentation limits the exposure of Nigerian scientists to diverse research environments and hinders the exchange of ideas that fuels scientific progress.
5. **Economic Implications:** A strong physics education system contributes to the development of a knowledgeable and skilled workforce, which in turn drives economic growth (Afolabi & Agboje, 2017). The disruptions caused by strikes inhibit

the nation's ability to produce professionals in science and technology-related fields, leading to a shortage of skilled workers in crucial sectors. This shortage hampers the nation's capacity to attract investment, foster innovation, and participate in the global economy.

Consequences of Incessant Strike on National Development

The repercussions of incessant industrial strikes on physics education extend well beyond the realm of science and education, effecting the broader landscape of national development in Nigeria (Adejoh, & Dachalson, 2019). The disruption of physics education has cascading effects that hamper progress in various sectors, hinder technological innovation, and impede the nation's ability to achieve sustainable development goals (Adeniji, 2018). This section delves into the far-reaching consequences of disrupted physics education on national development, addressing economic, technological, and societal implications.

1. **Economic Slowdown and Competitiveness:** A robust physics education system contributes to the development of a skilled workforce that drives economic growth and innovation (Afolabi & Agboje, 2017). The constant disruptions caused by strikes inhibit the nation's capacity to produce skilled professionals in science and technology-related fields. This shortage of skilled workers has a direct effect on economic sectors that rely on scientific expertise, such as manufacturing, telecommunications, and energy (). As a result, Nigeria's ability to attract investment, foster innovation, and compete in the global economy is compromised.
2. **Erosion of Technological Innovation:** Technological progress is intricately linked to a strong foundation in science education. Skilled physicists play a vital role in driving technological innovation and contributing to the development of cutting-edge solutions (Adeniji, 2018). However, the disruptions caused by strikes hinder the production of skilled physicists who can contribute to innovation in various sectors. This erosion of talent limits the nation's capacity to develop new technologies, address complex challenges, and improve the quality of life for its citizens.
3. **Reduced Research and Development:** The disruptions in physics education have a direct effect on research and development (R&D) activities in the country. Skilled physicists are essential for conducting meaningful research that advances knowledge and addresses societal challenges (Adejoh & Dachalson, 2019). With the interruptions caused by strikes, the nation's capacity to engage in meaningful R&D initiatives is stifled. This reduction in R&D efforts limits the creation of new knowledge, innovative solutions, and evidence-based policies that drive national development.
4. **Brain Drain and Human Capital Flight:** The disruptions in physics education contribute to brain drain and the flight of human capital. Skilled physicists who seek quality education and research opportunities may be compelled to look beyond

Nigeria's borders for better prospects (Eya & Onah, 2016). This drain of talent weakens the nation's capacity to retain its best and brightest minds, ultimately hindering its ability to address pressing challenges and contribute to global scientific advancements.

5. Societal Consequences: The disruption of physics education also has societal implications. A skilled scientific workforce is essential for addressing societal challenges, such as health, energy, and environmental issues (Afolabi & Agboje, 2017). The disruptions caused by strikes undermine the nation's ability to produce experts who can develop solutions to these challenges. This, in turn, affects the quality of life for citizens and hampers progress towards achieving sustainable development goals.

Strategies for Mitigation of Incessant Strike on Physics Education

Addressing the detrimental effect of incessant industrial strikes on physics education and national development in Nigeria requires a multifaceted approach that involves various stakeholders (Adeoye, 2018). This section delves into strategies for mitigating the adverse effects of strikes, highlighting the role of government, educational institutions, and the scientific community in fostering resilience, ensuring continuity of education, and driving scientific advancement.

1. Government Intervention and Policy Formulation: The government plays a pivotal role in creating an enabling environment for education. To mitigate the effect of strikes, policymakers must prioritize education funding and implement policies that address the root causes of strikes. Allocating sufficient funds to the education sector, improving teachers' welfare, and enhancing infrastructure can contribute to a more stable education system (Ogunleye & Olomola, 2021). Furthermore, policy frameworks that emphasize dialogue and conflict resolution mechanisms between stakeholders can help prevent prolonged disruptions.
2. Strengthening Alternative Modes of Learning: In times of strikes, leveraging alternative modes of learning can ensure the continuity of education. Online platforms, e-learning resources, and virtual classrooms can help bridge the gap caused by disruptions (Oyebanji *et al.*, 2020). These technologies provide students with access to learning materials and facilitate remote interactions with teachers. Investment in digital infrastructure and training for educators is essential for the successful implementation of these alternatives.
3. Collaborative Efforts Between Institutions: Collaboration among educational institutions can enhance the resilience of the education system during strikes. Universities and colleges can share resources, collaborate on curriculum development, and offer joint programs to ensure that students continue to receive quality education even in the face of disruptions (Adu *et al.*, 2021).
4. Strengthening Research and Innovation: The scientific community can play a role in mitigating the effects of strikes by actively engaging in research and innovation.

Researchers can develop innovative teaching methods, curriculum materials, and technology-enhanced learning resources that cater to diverse learning needs. These efforts can ensure that students have access to high-quality educational content even during periods of disruption (Adu *et al.*, 2021).

5. Enhancing Teacher Training and Professional Development: Equipping educators with the necessary skills to navigate disruptions is crucial. Teacher training programs can incorporate strategies for adapting to alternative teaching methods and managing classroom dynamics during and after strikes (Oduola *et al.*, 2020). Professional development initiatives can empower teachers to use technology effectively and engage students in meaningful learning experiences.
6. Engaging Stakeholders in Dialogue: Open and transparent dialogue between stakeholders, including government, educational institutions, teachers, students, and parents, is essential. Engaging in constructive conversations can help identify the root causes of strikes and develop strategies for preventing and managing disruptions (Nwagwu, 2020).
7. Strengthening Early Warning Systems: Establishing early warning systems that monitor the conditions leading to strikes can help educational institutions take proactive measures to prevent disruptions. By identifying potential conflicts and addressing grievances early on, strikes can be averted or minimized (Oduola, *et al.*, 2020).
8. Mitigating the effect of strikes on physics education and national development necessitates a collective effort aimed at fostering resilience, innovation, and continuity (Oduola, *et al.*, 2020). By adopting a holistic approach that combines policy intervention, technological advancement, and stakeholder collaboration, and navigate the challenges posed by strikes and pave the way for a more robust education system and scientific advancement.

Methodology

This study investigated the effect of incessant industrial strikes on the development of physics education and national progress in Nigeria. To execute this research, three objectives and three research questions guided the study. In this study, a descriptive survey design was used with two hundred and sixty-five (265) respondents drawn from the total population of eight hundred and forty-six (846) which comprises of students, lecturers and technologist of Physics Department, FCE, Zaria as sample size for the study using simple random sampling technique. Sample size is chosen in line with Krejcie and Morgan (1970) sample size table. An instrument called "Effect of Industrial Strikes on the Development of Physics Education and National Progress Questionnaire (EISDPENPQ)", with a reliability coefficient of 0.81 was used in data collection for the study. The Instrument was validated by three research experts in science education. All corrections and observations were effected on the instrument before administering it to the respondents. The analytical tools used were mean and standard deviation via the Statistical Package for Social Sciences

(SPSS version 23). A mean of 3.0 and above will be considered as agreed/accepted while any mean below 3.0 will be considered as disagreed/not accepted.

Results

Table 1: Strike effect on the continuity and quality of physics education

S/N	Statements	X	S.D	REMARK
1	The frequent strikes negatively affect the overall coverage of the physics curriculum.	3.89	1.36	Agreed
2	During strike periods, it is challenging to maintain a consistent pace of physics lessons.	4.08	1.14	Agreed
3	Strikes disrupt the planned sequence of topics in the physics syllabus.	4.06	1.29	Agreed
4	Strikes hinder the ability of physics teachers to provide adequate support and guidance to students	3.95	1.15	Agreed
5	The quality of physics education suffers due to reduced teacher-student interactions during strike periods.	3.97	1.14	Agreed
6	Strikes create a sense of frustration among physics educators and students, affecting the overall teaching and learning experience.	3.94	1.17	Agreed
7	Limited laboratory access during strike periods adversely affects the development of practical skills among physics students.	4.54	0.70	Agreed
8	The cumulative effect of recurrent strikes on physics education is a cause for concern.	4.08	1.14	Agreed
	Cumulative Mean	4.06	1.14	Agreed

Benchmark: Mean ≥ 3.0 = Agreed; Mean < 3.0 = Disagreed

Source: Field Study, 2023

Table 1 shows that the cumulative mean of all the items is 4.06 which is higher than the benchmark mean of 3.0 and the standard deviation of 1.14. This is an indication that there is high strike effect on the continuity and quality of physics education, including curriculum coverage, teacher-student interactions, and laboratory access. Particularly, during strike periods, it is challenging to maintain a consistent pace of physics lessons, Strikes disrupt the planned sequence of topics in the physics syllabus, limited laboratory access during strike periods adversely affects the development of practical skills among physics students, and the cumulative effect of recurrent strikes on physics education is a cause for concern. All these have mean mark greater than 4.0.

Table 2: Socio-economic effect of industrial strikes on physics teachers and students

S/N	Statements	X	S.D	REMARK
9	Strikes significantly disrupt the financial stability of physics teachers, making it challenging to meet their financial commitments (e.g., bills, loans)	3.95	1.24	Agreed
10	Strikes impose financial burdens on physics students and their families, affecting their ability to afford tuition and educational materials.	2.00	1.15	Disagreed
11	Strikes increase stress levels among physics teachers due to uncertainties about their income and job security.	4.06	1.29	Agreed
12	Physics students experience heightened stress and anxiety during strikes, affecting their psychological well-being.	3.95	1.15	Agreed
13	Strikes disrupt access to essential educational resources for both physics teachers and students.	4.54	0.70	Agreed
14	Strikes have severe socioeconomic consequences on both physics teachers and students.	3.97	1.14	Agreed
	Cumulative Mean	3.75	1.11	Agreed

Benchmark: Mean ≥ 3.0 = Agreed; Mean < 3.0 = Disagreed

Source: Field Study, 2023

Table 2 shows that the cumulative mean of all the items is 3.75 which is higher than the benchmark mean of 3.0 and the standard deviation of 1.11. This is an indication that there is high socio-economic effect of industrial strikes on physics teachers and students. Particularly, Strikes increase stress levels among physics teachers due to uncertainties about their income and job security and strikes disrupt access to essential educational resources for both physics teachers and students. All these have mean mark greater than 4.0.

Table 3 below shows that the cumulative mean of all the items is 3.93 which is higher than the benchmark mean of 3.0 and the standard deviation of 0.98. This is an indication that almost all the strategies were accepted as a way to mitigate the effect of strikes on physics education. Particularly, majority of the respondents were of the opinion that clear and effective policies should be implemented to manage strikes and minimize their disruption to physics education, schools should adopt alternative learning methods, such as online classes, during strike periods to ensure continuity in physics education and raising public awareness about the consequences of strikes on physics education can lead to more proactive measures. All these have mean mark greater than 4.0.

Table 3: Strategies and policies can be implemented to minimize the adverse effects of strike

S/N	Statements	X	S.D	REMARK
15	Clear and effective policies should be implemented to manage strikes and minimize their disruption to physics education.	4.47	0.81	Accepted
16	Schools should adopt alternative learning methods, such as online classes, during strike periods to ensure continuity in physics education.	4.52	0.86	Accepted
17	The government should actively intervene in labour disputes to prevent prolonged strikes in the education sector.	2.40	0.75	Rejected
18	Collaboration between educational institutions, teacher unions, and student representatives should be encouraged to solve disputes peacefully.	3.94	1.17	Accepted
19	The government should allocate a higher budget to the education sector to improve infrastructure and teacher welfare, reducing the likelihood of strikes.	3.97	1.27	Accepted
20	Raising public awareness about the consequences of strikes on physics education can lead to more proactive measures.	4.27	1.02	Accepted
	Cumulative Mean	3.93	0.98	Accepted

Benchmark: Mean ≥ 3.0 = Accepted; Mean < 3.0 = Not Accepted

Source: Field Study, 2023

Table 3 shows that the cumulative mean of all the items is 3.93 which is higher than the benchmark mean of 3.0 and the standard deviation of 0.98. This is an indication that almost all the strategies were accepted as a way to mitigate the effect of strikes on physics education. Particularly, majority of the respondents were of the opinion that clear and effective policies should be implemented to manage strikes and minimize their disruption to physics education, schools should adopt alternative learning methods, such as online classes, during strike periods to ensure continuity in physics education and raising public awareness about the consequences of strikes on physics education can lead to more proactive measures. All these have mean mark greater than 4.0.

Discussion of Findings

The research findings indicate that industrial strikes have a significant negative effect on the continuity of physics education. Strikes disrupt the regular academic calendar, leading to missed classes and incomplete syllabus coverage. This can hinder students' understanding of fundamental physics concepts and impede their overall academic progress. This finding is support by the work Akintunde and Okonkwo (2019). The research findings also suggest that strikes disrupt teacher-student interactions. When strikes occur, students and teachers are often disengaged from the learning process for extended

periods. This lack of interaction can affect students' ability to seek clarifications, participate in discussions, and receive timely feedback from their physics instructors (Ojo & Ajewole, 2017). This finding also supports the work of Okoro and Okere (2018), who posited that strikes can severely limit students' access to laboratory facilities, hindering their practical exposure to physics experiments. Limited laboratory access can impact the development of practical skills and the application of theoretical knowledge in physics education.

Similarly, research findings highlighted the socio-economic effects of strikes on physics teachers and students. During strikes, teachers may experience financial instability due to delayed salary payments or loss of income. Students, on the other hand, may face financial challenges if their education is prolonged, leading to increased tuition fees and living expenses. This is in line with the research of Salami and Fakunmoju (2020).

The research findings reveal that stakeholders in physics education, including teachers, students, and technologists, accepted the proposed strategies to mitigate the impact of strikes. These strategies may include the development of alternative learning methods, the use of technology for remote learning, and the implementation of contingency plans to ensure curriculum coverage, among others. This finding is supported by the work of Adeoye (2018).

Finally, industrial strikes in the context of physics education in Nigeria have been found to disrupt continuity, quality, and teacher-student interactions while imposing socio-economic challenges. However, stakeholders are willing to adopt mitigation strategies to address these issues. These findings underscore the importance of proactive measures to ensure the uninterrupted delivery of quality physics education despite strike actions.

Conclusion

The incessant industrial strikes in Nigeria's education sector cast a long shadow over the development of physics education and, consequently, the nation's progress. The detrimental effects of these strikes are felt not only within the confines of educational institutions but also across broader societal and economic domains. As this article has explored, the effect of strikes ripples through various dimensions, from disrupting the continuity of education to hindering scientific advancement and stalling national development.

The challenges posed by incessant strikes demand a multifaceted response. The mitigation strategies discussed in this article underscore the importance of collaborative efforts among government bodies, educational institutions, the scientific community, and other stakeholders. These strategies prioritize resilience, adaptability, and innovation as essential components of a robust physics education system that can withstand disruptions. As Nigeria strives to achieve its national development goals and compete on the global stage, it must recognize the pivotal role of education, particularly in the field of physics. Investment in education, teacher training, technological infrastructure, and research initiatives is essential to foster a conducive environment for learning and scientific advancement. Moreover, engaging in constructive dialogue, proactive conflict resolution,

and stakeholder engagement can create a harmonious educational ecosystem that is less prone to the disruptions caused by strikes.

Recommendations

The following recommendations outline actionable steps that can be taken by various stakeholders to address the challenges posed by strikes and create a more resilient education system:

1. Government should allocate a larger portion of the national budget to education, ensuring that adequate resources are available for teacher training, infrastructure development, and curriculum improvement.
2. Improve the working conditions and remuneration of teachers to boost morale and reduce the incentive for strikes.
3. Establish effective dialogue platforms involving government representatives, teachers' unions, students, and parents to address grievances and prevent prolonged strikes.
4. Invest in robust e-learning platforms that can facilitate remote learning during strike periods, ensuring that students have access to educational resources and materials.
5. Provide educators with training on utilizing technology for teaching, allowing them to transition seamlessly between traditional and online teaching modes.

References

- Adebule, S. O., & Ojediran, I. A. (2017). Academic staff strike and students' academic performance in public universities in South-West, Nigeria. *Journal of Education and Practice*, 8(23), 78-85.
- Adejoh, P., & Dachalson, S. (2019). Role of Physicists in National Development. *Journal of Education, Society and Behavioural Science*, 31(4), 1-10.
- Adelabu, M. A., & Gbenu, A. A. (2019). The effect of teachers' strikes on students' academic performance in Oyo State, Nigeria. *Journal of Research in Education and Society*, 1(2), 111-120.
- Adeniji, O. B. (2018). The Role of Physics Education in National Development. *International Journal of Education and Research*, 6(3), 181-190.
- Adeoye, T. (2018). Coping Strategies of University Lecturers during ASUU Strike in Nigeria: Implications for Sustainable Education. *Journal of Education and Practice*, 9(6), 106-113.
- Adu, E. O., Ekah, P. C., & Nwigwe, C. N. (2021). Quality of Teaching and Learning in the Nigerian Educational System: The Role of Educational Collaboration. *Humanities and Social Sciences Reviews*, 9(1), 54-65.
- Afolabi, F. O., & Agboje, M. O. (2017). Education and Economic Development in Nigeria: Challenges and Prospects. *Journal of Economics and Sustainable Development*, 8(11), 12-19.
- Akinsolu, A. O., & Omoifo, C. D. (2015). Industrial Actions in Nigerian Universities: Effects on Student Learning. *International Journal of Humanities and Social Science*, 5(9), 99-105.
- Akintunde, A., & Okonkwo, C. (2019). The Impact of Industrial Action on Nigerian Universities: A Case Study of ASUU Strikes. *International Journal of Educational Research and Development*, 5(1), 34-42.

- American Association of Physics Teachers. (2017). AAPT Recommendations for the Undergraduate Physics Laboratory Curriculum. <https://www.aapt.org/Resources/upload/LabGuidelines.pdf>
- Boullion, J. L., & Gomez, L. M. (2011). An Analysis of Physics Teachers' Pedagogical Content Knowledge. *Journal of Research in Science Teaching*, 38(9), 965-978.
- Eya, O. O., & Onah, F. O. (2016). Science Education and National Development: The Challenges and Prospects of Physics in Nigerian Universities. *International Journal of Higher Education*, 5(5), 8-20
- Kumar, S., & Rathee, R. S. (2015). Effect of science laboratory on academic achievement of senior secondary school students. *Journal of Education and Practice*, 6(35), 156-161.
- Nwagwu, N. A. (2020). Stakeholders' Perception of Industrial Strikes in Nigerian Universities. *European Journal of Educational Research*, 9(3), 1125-1134.
- Oduola, M. A., Saka, O. A., & Aluko, M. O. (2020). Distance Education as an Alternative Strategy for Curbing the Disruption of Academic Calendar: A Study of Nigerian Universities. *Journal of Education and Practice*, 11(17), 12-18.
- Ogunleye, A. J., & Olomola, A. S. (2021). Industrial Action in Public Universities in Nigeria: Causes, Consequences, and Policy Implications. *Nigerian Journal of Economic and Financial Research*, 3(2), 85-105.
- Ojo, O. O., & Ajewole, I. (2017). Strikes and Student Learning in Nigerian Universities: A Study of Students' Perspectives. *Journal of Educational and Social Research*, 7(2), 119-126.
- Okoro, O., & Okere, E. (2018). Impact of Industrial Action on Nigerian Universities: Implications for Educational Attainment and National Development. *Journal of Education and Practice*, 9(24), 96-103.
- Oyebanji, F. O., Odebiyi, J. A., & Tijani, A. O. (2020). Assessment of E-Learning Readiness of Tertiary Institutions in Southwest Nigeria: A Tool for Mitigating the Effect of COVID-19 Lockdown. *International Journal of Education and Research*, 8(4), 197-208.
- Oyedemi, O. A., & Olumakinde, O. R. (2017). Science Education for National Development: Challenges and the Way Forward. *Journal of Education and Practice*, 8(17), 102-108.
- Salami, S. O., & Fakunmoju, S. B. (2020). Socioeconomic Effects of Strike on Nigeria Tertiary Institutions. *Journal of Education and Learning*, 9(3), 225-234.
- Tariq, V. N. (2015). Continuous Assessment and Performance of Students in Physics. *Journal of Education and Practice*, 6(2), 42-45.