

Role of Physics Education in a Security Distressed Nation

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Abstract

The study investigated the role of Physics Education in a security-distressed nation. Two research questions and two hypotheses guided the study. The study adopted descriptive survey design. The population comprised 430 students of Kogi State Collage of education Ankpa. The entire population was used for the study. The Instrument tagged students perception on the role of physics Education in overcoming security challenges (SPRPEOSC), validated by 3 Experts in physics and measurement and evaluation, was used for data Collection. The reliability of the instrument was determined using Cronbach Alpha formula with overall index of 0.85. Data collected were analyzed using mean and standard deviation and Z-test statistics. The study found that physics Education can effectively be used to overcome security challenges in Nigeria. Based on the findings, the researchers recommended that physics education should be given priority in the national education policy so as to promote national security to life and properties of Nigerians among others.

Keywords: Physics Education, Security and Distressed Nation

Introduction

No doubt, Nigeria as a nation and like every other nation in the world is distressed with security challenges. It is no longer news that Nigeria has been experiencing series of security challenges at an alarming rate (Akor, 2014). A nation that is under security threat and tension raging from violent attack, bombing, banditry, insurgency, Kidnapping, political killing, Religious crises and religiously motivated killings, cultism and ritual killing, can never be stable or free of security distress. Nigeria as a nation is being faced by this horror, coupled with a range of other hazards including crimes, fire and attendant disasters, sabotage, subversion, civil disturbance, jail break, bombing etc. These security challenges are the Antithesis of security and has attracted such common descriptions as want of safety, danger, hazard, uncertainty, and lack of protection. A scenario whereby Nigerian citizens cannot travel freely from one State to another or within the neighborhood, people carry their heart on their hands as they move or travel from one place to another. This description of insecurity or security challenges were explained by different authorities as sighted in different literatures. security challenge is the state of being vulnerable to harm and loss of life, property and livelihood (Benjamin, 2016).

Security challenges has severely impinged on the fundamental human rights to education in Nigeria.

According to Ajabor and Ichazu (2022) from 2009 until December 2019, 611 teachers were killed, 910 schools damaged or destroyed and more than 110 schools were forced to close due to Boko Haram related insurgency, interrupting the schooling of more than 900,000 Children. Over 169 schools were burnt from 2011 to 2022 in Benue state and fighting there between pastoralist and farmers forced 300,000 pupils out of school in 2018. However, over 112 of the 276 school girls abducted on April 14 2014, from a secondary school in the Chibok area in Borno State, remained missing. In 2019, many were presumed to have been forced into early marriage and pregnancy by their captors based on accounts from released girls (Global coalition to protect Education from Attack, 2020). The aims and objectives of Education can only be achieved in a conducive and peaceful school environment. If there is a feeling of insecurity within and without the school environment, both students and teachers are likely to be deterred and this may inhibit student educational carrier (Ogwu, 2018). Ogwu opined that when students study in an environment that is characterized by insecurity, the students may suffer



socially, mentally and emotionally and is likely to affect not only their behavior but also their educational pursuit.

The level of insecurity in the country is on the increase despite the huge sums of money budgeted on yearly bases as security votes by the three tiers of government. The resultant effect of this state of insecurity is that the country now suffers from a lot of brain drains of intellectuals who drift to other more peaceful and secured countries. Unfortunately, several efforts have been made by national security agencies to provide effective and enduring security mechanism, yet the problem of insecurity has remained unabated (Okeni, 2017). The security challenges experienced in the country presently requires all and sundry to be more proactive on issues of national security so as to curb the dangerous situation that is ravaging the nation. Some of these security challenges which have been ravaging the nation for some time now, have defiled every effort put in place to control or combat them by the security apparatus of the country. Hence there is a need to use physics Education to salvage the insecurity in our nation.

Physics is a pure science subject that deals with behaviors of matter and energy and how it relates with other physical properties (Ezebuio, 2015). This conceptual meaning of physics shows that it is a basic physical Science Subject which deals with the behavior and interaction of matter and energy which are referred to as physical phenomena. Physics as a branch of the physical science plays a vital role in providing knowledge of relevant contents, scientific skills, natural phenomena and environment. According to Achor (2014), physics education is known to play some specific roles in the development of any nation. Some of these importance roles of physics education in the lives of student of senior secondary schools are to prepare them for further studies in relevant vocations, and develop certain scientific attitudes such as curiosity, creativity, open mindedness and honesty.

The knowledge of physics education is important for effective living in this present modern age. Considering its numerous applications in industry and other professions, it is therefore, imperative that every individual is given an opportunity to acquire its concepts, principles and skills. However, critics of scientific and technological development argue that the continuous use of scientifically developed weapons and ammunition such as rocket- launchers, ballistic missiles and improved explosive devices are the creations of physics education and therefore

maintains a high level suspicion on the position of physics education in promoting peace and national security (Amusa, 2016). In the study of Ogunleye (2016), physics education has provided man with increasingly clear pictures of how to overcome national security and security challenges of a distressed nation by solving the problem of unemployment in the country. Graduates of physics education can be self-employed because he has some knowledge of electronics that can make him be able to have a little period of training as an apprentice and then stand as an electronic technicians. For example, semiconductor is very important in the modern technology and useful in ceramics which if learnt, can enable a person to earn a living. A graduate of physics can also work in hospital in radiology department, he can be a physics teacher in a secondary school or university physics lecturer. Physics education enables individual to think rationally. It then follows that if a nation educates their people with the right type of education especially physics education, the citizen will not turn against their fatherland rather they will behave well to promote security within and outside of their community. It is therefore necessary to provide learners with broad based and all encompassing physics education for the development of mind, soul and the body, for the development of appropriate attitudes, skills, abilities and competencies to co-exist with and contribute to the development of the society.

Physics education can be used to remedy security challenges because physics education help in manufacturing of weapons that can be used as security gadget such as nuclear power, Cyber security to mention but a few. Secondly, physics education contributes to the technological infrastructure and provide trained personnel needed to take advantage of scientific advancement and discoveries. Thirdly, physics education is an important element in the education of chemists, engineers and computer scientist as well as practitioners of other physical and bio medical sciences. Fourthly, physics education through the educational system assist in absorbing, training, empowering and engaging youth in Nigeria which shields them from idleness and the danger associated with it. Finally, physics education generates fundamental knowledge needed for future technological advances that will advance the economic engine of the world. Physics education do not only contribute to the economic value of the people but has capacity to generate and offer employment to the unemployed, which makes physics education a foundation of development in every society. Therefore,



it is important to every individual and the society at large to see physics education as a very strong agent of national security and remediation of security distressed nation.

Furthermore, physics education is concerned with finding solutions to problems in a bid to understanding and interpreting natural phenomena (Oladeji, 2018). Oladeji further pointed out the reasons for teaching physics education in schools are for the production of much needed man power for the nation, acquisition of scientific knowledge, development of individual potentials, essence of discovery, development of rational thought, explaining of natural phenomena and general scientific literacy. All these would culminate to enhanced security. Scientific literacy is the ability of an individual to live gainfully and conveniently in a science and technology world. Scientific literacy enables individual to interact with technology and society, and use this understanding to communicate, take part in decision making as well as to solve emanating socio-scientific problems and issues. These will eradicate the thoughts of crime and criminality, thereby promoting the security of the nation. Ugwu (2019) added that physics education is education given to both male and female individuals to enable them fit into the operational system of science either as a body of knowledge or as an inquiry process. Ugwu maintained that physics education helps to inculcate scientific attitudes into both male and female student such as curiosity, humility, critical mindedness or skepticism, objectivity, rationality, suspended judgment, open – mindedness and honesty. Physics education has contributed immensely towards improving the quality of human life by providing information on drug abuse, means of preventing and curing human disease as well as rehabilitating human disabilities. These are aimed at promoting the security of the nation.

In physics education, students are encouraged to think and act as responsible scientist. Physics education contribute to the security of the nation by increasing productive capacity of its citizens (Oladeji, 2018). It can therefore be deduced from the foregoing that physics education can be used to remediate security distressed nation, especially in the developing nations such as Nigeria. This is based on the fact that physics education holds the key to the economic and technological development of nations, which will culminate to improved security of lives and properties. Moreover, physics education is a field of study concerned with producing a scientifically literate

society. Illiteracy has been identified as one of the reasons for such security challenges as Boko haram and Herdsmen menace which is among the serious security challenges facing Nigeria presently, that is keeping the nation and her citizens under security distress. Physics education acquaints students with knowledge, skills and attitudes needed to work in science related fields. This is important because when people are gainfully employed and are busy doing one kind of job or the other the rate of crime and criminality will be drastically reduced and subsequently eradicated. Hence a need to investigate the role of physics education in a security distressed nation.

Statement of the Problem

It is no longer a story or news that Nigeria has been under a serious security distress. In recent times, Nigeria as a nation has witnessed various security challenges raging from attacks in schools, roads, communities, prison, or correctional centers, motor packs and even car packs. Nigeria has recorded a lot of security challenges ranging from Boko Haram insurgency, armed banditry, suicide bombings, abductions, killing, kidnappings, rape, prison break, and an escalation in attacks on the students and teachers resulting to killings and server injuries. The security challenge has threatened the essence of national integration in the country and created fear and anxiety that have kept the nation under distress. It has also meted a deadly blow on families, where people abandoned their home and communities for safety. School programmes have often been adjusted; student sent home as a result unprecedented attacks.

Educational institution which is seen as the bedrock of national development is now in a state of fear and threats of attacks as result of insurgency and terrorism. No nation can thrive under security distress, as life and property are been threatened. Physics Education in Nigeria schools and in many nations has deteriorated over time due to poor funding of the entire education sector. The problem of poor funding of education has resulted into numerous deficiencies such as poorly equipped laboratories, ill-prepared teachers and lack of internet – access among others. Despite the fact that the government has placed a strong emphasis on the science education where

physics form a basic part in the country's school system, Priority is not given to funding and supply of needed amenities in schools. This condition cannot guarantee efficient physics education that can promote national security. Hence the need to carry out this study, role of physics education in a security distressed nation.

Research Questions

1. What are the mean perception scores of students on the role of physics education in overcoming the security challenges of the nation?
2. What are the mean perception scores of male and female students on the challenges of physics education in promoting national security?

Hypothesis

The following null hypotheses tested at 0.05 level of significance guided the study.

- Ho₁ There is no significant differences in the mean perception scores of students on the role of physics education in over coming the security challenges of the nation.
- Ho₂ There is no significant difference in the mean perception scores of male and female students on challenges of physics education in promoting national security.

Methodology

This study adopted descriptive survey design. The study was carried out in Kogi State Collage of education Ankpa. The population comprised all the 430 students (male 227 and female 203) of both NCE and degree students in 2022/2023 academic session. The choice of both NCE and degree student is because they are all available for the research work. The entire population was used for the study since it was manageable as such there was no sample and sampling techniques. The instrument for data collection was a

researcher made questionnaire tagged students perception on the role of physics education in overcoming security challenges (SPRPEOSC) with five point likert rating scale of strongly agree (SA), Agree (A), Undecided (U), Disagree (D) and strongly disagree (SD) weighted as follows 5,4,3,2 and 1 respectively for the two research questions. The questionnaire had parts (A and B) . Part A sought information on the personal data of the respondents, while B comprises 20 items on the role of physics education in overcoming security challenges in the nation and the challenges facing its effectiveness. Validation of the instrument was done by three experts in physics education from Kogi State collage of Education Ankpa both in the NCE and degree section. Cronbach Alpha was used to determine the internal consistency of the items. This involved the conduct of pilot study with a sample selected from the school of sciences in another collage of education in the neighbouring state (Moon light collage of education Adoka Benue State). At the end, a reliability index of 0.84 and 0.85 was obtained for clusters A and B of the instrument respectively, with an overall reliability coefficient of 0.85 for all the clusters. This was considered high enough for the study. All the 4 30 copies of the questionnaire were distributed to the respondent by the research through the assistance of the respective course representatives of the students and staffs all the questionnaires were returned giving a 100% return rate. Mean with standard deviation were used to analyze data while the hypotheses were tested using Z-test statisticsat 0.05 levels of significance. The statistical tool was deemed appropriate since the respondent were more than thirty (30) involving dichotomy in perception between male and female students (Abuh & Achor, 2019). The decision rule was that any item with mean score of 3.00 and above was interpreted “ Accepted” Which mean below 3.00 was interpreted “Unaccepted”, for the hypotheses if the calculated z-value was greater than or equal to the Z-critical value , null hypothesis is rejected. If the calculated Z-value was less than the Z- critical the null hypothesis isnot rejected.

Results

Results are presented in table according to the research questions and hypotheses.

Table 1: Mean and Standard Deviation Scores of Students on Perception of the Role of physics Education in Overcoming Security Challenges in a Security Distressed Nation

S/N	Items	Means	S.D	Decision
1.	Physics education eradicate poverty for responsive living in the society	3.73	1.38	Accepted
2.	Physics education inculcate literacy into individual for responsible and positive behaviour in the society	3.75	1.35	Accepted
3.	Physics education is important for national unity and peace	3.77	1.33	Accepted
4.	Physics education enables individual acquire improved quality life for functional living	4.69	0.81	Accepted
5.	Physics education helps individual to acquire knowledge that ensures all round security in a security distressed nation.	4.08	1.17	Accepted
6.	Development of knowledge through physics education has reduced the problem security distressed nation	3.76	1.34	Accepted
7.	Physics education equips individuals to live security conscious lives in a security distressed nation	3.77	1.33	Accepted
8.	Physics education skills enhance national development	3.79	1.30	Accepted
9.	National development through physics education promote national security	4.64	0.78	Accepted
10.	Physics education is needed for promoting progressive and secured nation	4.07	1.18	Accepted
	Total	4.01	1.12	Accepted

N=430

Data in Table 1 indicates students' perception of the role of the physics education in overcoming the security challenges of the nation has overall mean score of 4.01, overall standard deviation of 1.12. The table

equally revealed that mean perception scores of the students on all the 10 items were higher than the bench mark of 3.00. This implies that physics education is highly used for overcoming security challenges in the

nation Nigeria for peaceful living. Also, from **table1**, the total mean perception score and lower mean standard deviation 1.12 shows that the student's

opinions were more clustered which means their perception were similar.

Table 2: Mean and Standard Deviation Scores of Student

S/N	Items	Means	S.D	Decision
11.				
	Lack of creative and innovative teaching hinders effective physics education	3.68	1.23	Accepted
12.	Poor method of teaching adopted by teachers hinders effective physics education	3.66	1.15	Accepted
13.	Poor funding is a challenges to effective physics education	4.32	1.03	Accepted
14.	Lack of qualified teachers hinders effective physics education	3.78	1.22	Accepted
15.	Lack of equipment hinders effective physics education	3.85	1.26	Accepted
16.	Lack of equipped science laboratories hinders effective physics education	3.57	1.39	Accepted
17.	Lack of job opportunities in science makes students lose interest in physics education	3.98	1.09	Accepted
18.	Low student interest due to poor performance affect physics education	3.58	1.39	Accepted
19.	Non – availability of textbooks and other institutional materials hinders effective physics education	4.00	1.08	Accepted
20.	Non- implementation of government policies o science affects physics education development	4.32	1.03	Accepted
	Total	3.87	1.18	Accepted

N=430

Data in table 2 shows that the students' perception scores on all the 10 items that are based on challenges of physics education in promoting national security in Nigeria with grand total of 3.87 and standard deviation of 1.18 was higher the bench mark score of

3.00 moreover the mean perception score each of the items is higher than the bench mark of 3.00 this implies that the student perceived all the 10 items as factors or challenges that hinder effective role of physics education for promoting national security in Nigeria

Table 3: Z- test- Analysis of Students Perception Scores on the Role of Physics Education in over coming the security challenges of the nation by gender.

Gender	N	Mean	S.D	DF	Z-cal	Z-crit	Sig.	Decision
Male	227	3.88	1.33	428	0.41	1.96	0.05	Accepted Ho as stated
Female	203	3.84	1.35					

Data in table 3 shows that the calculated Z-value at 0.05 levels of significance and 4.28 degree of freedom is 0.41 which is less than the critical Z-value of 1.96. Thus the null hypothesis is accepted as stated.

This means that there is no significant difference in the male and female students' perception on the role of physics education in overcoming security challenges of the nation.

Table 4: Z-test analysis of male and female students' perception on the challenges of physics education in promoting national security.

Gender	N	Mean	SD	DF	Z-cal	Z-crit	Sign	Decision
Male	227	3.91	1.33	428	031	1.96	0.05	Ho Accepted
Female	203	4.00	1.24					

Table 4: Shows the calculated z-test of 0.05 level of significance and 428 degree of freedom is 0.31 which is less than the critical Z-Values of 1.96, therefore, the null hypothesis is accepted. These means that there is no significant differences in the male and female students' perception on the challenges of physics education in promoting national security in a security distressed nation.

Discussion of findings

The finding of this study has shown that physics education can be used in overcoming the security challenges of the nation and hypothesis1 shows that no significant difference exist in the mean perception scores of the students on the role of physics education in overcoming security challenges of the nation, Nigeria. These findings in line with Akor (2014) and Oken (2016) who stated that education is a vital tool for national development and security. Moreover, Okorocha and Nwachukwu (2017) added that effective management of physics education enhances a country's national security. It implies that principle and skills of physics education can be applied in overcoming security challenges of the nation. Thus, for Nigeria to achieve national security, Physics education must be given priority in the national education policy.

The finding of this study revealed that the challenges of physics education in promoting national security in Nigeria are lack of creative and innovative teaching, poor method of teaching adopted by teachers, poor funding of physics education and education generally, lack of qualified teachers, lack of equipment for effective teaching of physics education, lack of equipped physics laboratories, lack of job opportunities in physics education, low student interest, non-availability of textbooks and other instructional materials and non-implementation of government policies on science, affects physics education development. And hypothesis 2 equally revealed that there is no significant difference in male and female students' mean perception scores on the challenges of physics education in promoting national security in Nigeria. The finding of these study agree with Okorocha

and Nwachukwu 2017 and Oladeji (2018) who identified inadequate funding, inadequate qualified physics teachers, non-availability of text books and other instructional materials lack of well-equipped physics laboratory poor, method of teaching, apparent lack of job opportunities in science, lack of innovation and modifications of physics education curriculum, and Non-implementation of government policies on physics education as challenges that hinder effective implementation of physics education in Nigeria. This implies that physics education in Nigeria is facing several challenges which hinder its effective development and implementation, thereby affecting its role in promoting national security in Nigeria.

Conclusion

Security involves all the strategies employed by sovereign state to protect her core values and citizens from threats in all ramifications. Security in Nigeria entails ability to protect, promote and maintain its vital institutions for enhanced peaceful coexistence. However, Nigeria is presently facing security distress. Threats to life and properties have become the order of the day in Nigeria, with ethno- religious conflicts, political and ethnic militancy, high profile political assassinations, kidnapping, smuggling, jailbreak and bunking of resources among others that continue to threaten Nigerians national security. These security distress or challenge seem to have defied solutions. This study has shown that if Nigeria must come out of these security distresses and to bring about the desired national security, she must give priority to physics education in the national policy, also implement such policy, which should be both ethical and globally driven. This is because physics education has been proven to be useful in promoting national security as discovered from the findings of this study.



Recommendations

Base on the findings of the study, the following recommendations were made:

1. Physics Education should be given priority in the national education policy so as to promote national security to life and properties of Nigeria
2. Equally, Physics education polices should be implemented both ethnically and globally by the government in order to guarantee national security.
3. Finally, Effort should be made by the stakeholders in education and government to proffer solutions to such challenges as poor funding, in adequate and qualified teachers, lack of equipment, laboratories and other infrastructures which hinder effective role of physics education in promoting national security.

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