Science Education International
33(2), 156-162
https://doi.org/10.33828/sei.v33.i2.3

REVIEW ARTICLE

The Challenges of Providing Science Education to Disadvantaged Pupils in Nigeria

Oloyede Solomon Oyelekan[1]*, Johnson Enero Upahi[1,2]

[1]Department of Science Education, Faculty of Education, University of Ilorin, Ilorin, Nigeria, [2]Department of Science and Technology Education, Faculty of Education, University of Johannesburg, Auckland Park Kingsway Campus, Johannesburg, South Africa

***Corresponding Author:** solomonoyelekan@gmail.com

ABSTRACT

Disadvantaged pupils are those pupils whose ability to learn in school is impeded by their family, social or economic situations which are often times beyond their control. Without adequate intervention, there are chances that this group of pupils could drop out of school. In Nigeria, there are many categories of disadvantaged pupils into which a vast majority of pupils can be grouped. Providing science education requires a lot of resources and organization. By its nature, the engagement of children in science education under an ideal environment is a huge task, let alone for pupils who are disadvantaged and must learn science under abnormal circumstances. The gravity of the disadvantage suffered by these pupils vary, hence, this paper focuses on two very critical groups of disadvantaged pupils in Nigeria (the pastoralist nomads and the *Almajiris*) and describes the challenges faced by educators in providing science education to them. The paper further presents a critical appraisal of some national and international educational programs which are designed to assist educationally disadvantaged pupils with an intention to explore the successes and failures of such programs within the Nigerian context. Some recommendations on how to tackle the identified challenges are proposed.

KEY WORDS: Almajiri; disadvantaged pupils; Nigeria; nomads; science education

INTRODUCTION

It is our view that an understanding of the environment in which one lives is critical to one's survival. This understanding is acquired through a gradual process of education from infanthood to adulthood, which runs throughout one's entire life time. The society in which we live in is expected to be organized in a way that ensures that provision is made for all citizens to acquire the necessary education for survival. However, providing access to certain forms of education to certain categories of people in the society is a herculean task. Fafunwa (2004) defined education as what each generation gives to its younger ones which makes them develop attitudes, skills, abilities, and other behaviors which are of positive values to the society in which they live. We define education as the transmission of the norms, values, practices, crafts, and ideals that characterize a society to the successive generations. These are the basis on which the society survives. Some of these are acquired informally from parents, the community, and the society at large, while others are acquired within a formal school system.

Over the years, human knowledge has improved tremendously and this has, in turn, resulted in better standard of living. Today, human needs have become very complex and everyone strives to survive in an ever-changing society. Human society has witnessed a knowledge explosion and this has led to the compartmentalization of knowledge into various disciplines and sub-disciplines for which most humans have some knowledge. Every discipline comes under the broad discipline of education. Hence, we have disciplines such as commercial education, arts education, medical education, legal education, technical education, and science education. The focus of this paper is on science education.

Oyelekan (2016) defines science education as "the process of transferring scientific knowledge, skills, and processes from one person to another" (p. 112). This includes scientific attitudes as well. Science deals with knowledge about nature, which comprises the physical earth and its living components. The knowledge of science enables us to know the basis of the occurrence of many things that happen in our environment. Through this, we are then able to tap on this knowledge to make things work for us. For instance, knowledge of plant growth enables us to improve our agricultural practices.

The discipline of science education is concerned with "discovering, developing, and evaluating methods and strategies to be used in teaching science" (Olorundare, 2014, p. 8). It also involves conducting research focused at advancing the teaching and learning of science. The training of teachers for a career in science teaching also falls within the purview of science education.

Olorundare (2014) viewed science education from two perspectives: Education in science and education about science. While education in science is confined to a minority of the population in a society who acquire scientific knowledge,

Science Education International
33(2), 156-162
https://doi.org/10.33828/sei.v33.i2.3

skills, attitudes, and behaviors that enable them to practice science-based professions; education about science is general for every citizen, and it is expected to provide them with the requisite scientific literacy required to survive in the society. Education in science is confined to core science subjects such as physics, chemistry, biology, and advanced science and technological disciplines such as medicine, engineering, and computer science; however, education about science concerns itself with providing general scientific knowledge that cuts across science subjects which are basic to living a meaningful life. Hence, providing basic knowledge about HIV/AIDS, global warming, weather, etc., to the populace, falls within the purview of education about science. This is consistent with Jablon's (2020) orientation of science education as "the field that is concerned with sharing science content and process with individuals not traditionally considered part of the scientific community" (p. 88). He further states that the target individuals may be children, college students, or adults within the general public.

Education is the right of every human being. Society must, therefore, be structured in such way that ensures its access to every one of its members. Unfortunately, some categories of the human population have their access to education impeded and this limits their potentials for successful living and having a fulfilled life. Quite often, these people find themselves in this situation out of no fault of their own. It is, therefore, important that efforts be made to improve education access to these categories of people.

Reports indicate that access to education is generally poor in Nigeria. According to UNICEF (2017):

> One in every five of the world's out-of-school children is in Nigeria. Even though primary education is officially free and compulsory, about 10.5 million of the country's children aged 5–14 years are not in school. Only 61% of ages 6–11 years regularly attend primary school and only 35.6% of children aged 36–59 months receive early childhood education. In the north of the country, the picture is even bleaker, with a net attendance rate of 53% (para. 1-3).

Similarly, Sahara reporters reported on its website on April 13, 2019, that the Minister of Education, Mallam Adamu Adamu painted a gloomy picture of the state of education in Nigeria when he reported that Nigeria had 10,193,918 out-of-school children. He was quoted to be reporting from the 2018/2019 Annual School Census conducted by some government parastatals including the National Bureau of Statistics (NBS), the National Population Commission (NPC), and the Universal Basic Education Commission (UBEC). The implication of this is that the population of disadvantaged pupils in Nigeria is more than this figure, since some of those who are enrolled in school also suffer one disadvantage or the other. This alarming figure portends danger for the country in the near future if nothing is done to address this situation. Science education is practical oriented and requires more funds to provide. This makes access to it more difficult even for advantaged pupils.

Hence, this paper discusses the challenges of providing science education to two identified disadvantaged groups of children in Nigeria and advances some possible solutions to them. The focus is on the nomadic children and the *Almajiri* children.

THE CHALLENGES OF PROVIDING SCIENCE EDUCATION TO DISADVANTAGED PUPILS IN NIGERIA

The Nomadic Children

In Nigeria, nomads are a group of people who do not have a permanent place of abode, but rather move from one place to another, settling down temporarily at various points. There are two main categories of nomads: The pastoralist nomads who rear cattle and other animals, and the fishermen who make their living from fishing. The pastoralists migrate seasonally to areas where they can find grasses to feed their herd, and the fishermen also migrate to where they can get fish to catch. According to the National Commission for Nomadic Education (NCNE, 2019), the population of the nomadic pastoralists is estimated to be over 6.5 million while that of the migrant fishermen is around 2.8 million. The pastoralists are mainly the Fulani herdsmen who move around with their cattle. In Figure 1, the cows can be seen grazing where the grass is beginning to grow greener. According to Stammler (2005), nomads or herders migrate with the first appearance of grass, because they consider the first grass and the young leaves of the shrubs as the best. There are other smaller ethnic groups such as the Shuwa Arab, the Koyam, the Badawi, the Buduma, and the Dark Buzu. These people are found across the states of Nigeria. The nomad fishermen are found at the Atlantic coastline and the riverine areas of the southern part of Nigeria (NCNE, 2019).

Nomadic people are believed to live a sub-standard life devoid of civilization and they are generally regarded as undeveloped. According to Aderinoye et al. (2007):

> Nigeria's nomadic people are typically described in terms of what they do not have. They do not have access to adequate

Figure 1: Cattle rearing in the outskirt of Ilorin

> food, clean water, health care, clothes, or shelter. They do not possess basic literacy skills. Their children do not have access to basic education. Young female nomads do not have the cultural freedom to marry who they want to marry. (p. 1)

Of particular interest in this paper is the pastoralist nomads whose children lack access to basic education, and the Almajiris who are pupils of Islamic education turned beggars. The pastoralist nomads live a simple life. Their main pre-occupation is the care of their herd (Figure 1). They live an extended family system and move around as such. They exhibit close family ties and marry within their own folds.

Within some ethnic groups like the Fulanis, family members as close as cousins marry one another, and their children are brought up to follow the footsteps of their parents as pastoralists. Male members of the family rear the cattle and the other animals while the milking of the cattle, processing, and sale of the milk are handled by the females.

Pastoralists live in huts built in the bush and only come to towns or cities occasionally for business transactions. Sometimes, they live in isolated areas in the outskirt of towns and cities for easy access to market for their animals and milk. We recognized that they care less about formal education and are sometimes too distant from the realities of the modern world. Due to their social orientation, educating their community has become a herculean task.

The challenges of providing science education to the nomads are associated with the approaches to nomadic education adopted by government and other stakeholders. In principle, Iro (2006) identified two main approaches adopted for nomadic education:

1. Radio and television education
2. Mobile schools

The government recognizes that it is habitual for pastoralist nomads to go about with portable transistor radios, while a few of them also have television (TV) sets in their huts. Hence, government has taken advantage of these two to educate them, especially about science. Information about HIV/AIDS and other communicable diseases, drug abuse, global warming, weather forecast, and other useful information can be effectively disseminated through these means. Through this means, they can equally be educated on how to take better care of their animals. However, it is really difficult to deliver effective science instruction through the radios and televisions without cable networks. Science teaching involves displays and illustrations that cannot be effectively done over the radio. While science subject instructions could be delivered on cable television, there are still some limitations. An effective science instruction provides pupils with the opportunity to interact among themselves and with the teacher, as well as instructional materials. According to Lev Vygotsky, learning takes place when students interact with others who are more knowledgeable, including peers, and instructors, who can provide guidance in the zone of proximal development (Schaffer, 2006). We argue that the role of other agents in the development and learning processes of pupils, including how pupils learn in cooperation with adults or more experienced peers who can guide them with more complex concepts, cannot be overemphasized. This explains why science instruction may not be achievable through the radio and television.

Another challenge with radio and television approach is the formalization of classes and grades. How do we group the students into respective classes and grade levels on the basis of their age, and organize them to listen to the radio or watch the educational programs on television at particular times? How do we organize notebooks and textbooks for them, and how do we carryout formative and summative evaluation of their learning? At best, *education about science* is probably achievable through this approach and not *education in science*. There is also the challenge of non-availability of TV network in the areas inhabited by many of these pastoralists. Sometimes, they live so far into the bush that TV signals could hardly reach.

Mobile schools are constructed using collapsible materials which can be assembled and disassembled within a short period of time. This is one of the methods adopted by the Federal Government in providing education for nomadic children. The schools are established to follow the herdsmen along their path and set up in strategic points accessible to the children. The challenge here is that these schools are not easy to run. It is difficult to get committed teachers who will somehow themselves take up a pastoralist life in ensuring the education of these nomads. With respect to teaching science, setting up and dismantling a laboratory repeatedly is perhaps an impossible task. Hence, the teachers will resort to teaching science more theoretically than practically. This will make the attainment of the objectives of science teaching very difficult.

Another major problem with the mobile schools is truancy. Pastoralist nomads rely heavily on their children for the herding of animals. Iro (2006) reported that children make up about 68% of the herding labor among Fulani herdsmen. A typical pastoralist nomad is unwilling to release his children to attend school at the expense of herding. They engage their children in herding as early as the age of 3. Sharing their time between schooling and herding is a difficult task. As far as many pastoralists are concerned, herding is life. Getting teachers to teach in rural schools are difficult, not to even talk of nomadic schools that are not only rural but unstable in terms of location. Many science teachers may not want to work in nomadic schools unless they are highly motivated.

Another challenge of providing science education in nomadic schools, especially the elementary schools, is the language of instruction which is English. Unlike the regular children in towns and cities, the nomad pastoralists learn only their local language from their parents and they have very limited, if any, opportunity of anyone speaking English language to them other than their teachers. Hence, learning science in English is difficult for nomadic children since the subject is designed to be taught in English.

Science Education International
33(2), 156-162
https://doi.org/10.33828/sei.v33.i2.3

The Federal Government of Nigeria has embarked on several intervention programs aimed at providing not just science education alone, but general education to nomadic populations. The major intervention was the establishment of the National Commission for Nomadic Education (NCNE) through Decree 41 of 1989. This commission is saddled with the responsibility of formulating and implementing policies that will take education to the nomadic population in Nigeria. According to the NCNE (2019), the objectives of nomadic education in Nigeria are aimed at ensuring that the nomadic child is self-reliant to improve his/her living conditions, thus eliminating the hardships and constraints in their lives. In achieving these objectives, the Nomadic Education Programme through NCNE developed and utilized some innovative approaches which include "robust collaboration and partnerships with relevant governments, institutions and organizations in program development, implementation, and evaluation" (Tahir et al., 2005, p. 19).

Other approaches adopted by NCNE according to Aderinoye et al. (2007) include the establishment of onsite schools, the adoption of the "shift system" schools, and the Islamiyya (Islamic) schools, to provide literacy education to the nomads. They, however, stated that very few of these schools survived. According to Tahir et al. (2005), toward the successful implementation of the Nomadic Education Programme (NEP), the NCNE is mandated among other things to formulate policies and issue guidelines in all matters relating to nomadic education in Nigeria.

In performing these functions, NCNE claims that it has established 3611 nomadic schools across the country with nearly 15,000 teachers and almost 600,000 pupils. The schools are run through the support of the Universal Basic Education Commission (UBEC). The NCNE also ensures that nomadic teachers are trained regularly on pedagogical skills and school administration and management. They are also given special training on nomadic education to enable them cope with the peculiarity of their job. To facilitate the transportation of the teachers to their schools, they are provided with motorcycles and canoes as the case may be. The commission also sponsors the production of textbooks for the pupils and teachers' manual for the teachers.

There have been some arguments against nomadic education. According to Amadi (2015), some of these arguments include:

1. The impracticability of the program as they have no permanent abode.
2. Its tendency could create second rate education.
3. The need to pursue settlement policy first before nomadic education.
4. The possibility of it being an avenue to waste public funds (p.18).

However, in an impact evaluation of nomadic education in the Northeastern part of Nigeria, Osokoya and Aminu (2002) concluded that the output of the program was satisfactory and its impact on the nomadic population was significant. A report by The Nation newspapers on August 28, 2018, which was entitled "Nomadic Education: 30 years after" appraised the program 30 years after its commencement and presented a mixed report. The report identified many challenges facing nomadic education to include:

1. Inadequate funding
2. Inadequate teachers
3. Insufficient infrastructure
4. Persistent herdsmen/farmers clashes and cattle rustling
5. Desertification has also consistently thrown migrant fishers and farmers back and forth, making it difficult for teachers to package an organized syllabus for the pupils.
6. Truancy
7. Convincing the nomads on the importance of educating their children, since most of them still view western education as a waste.
8. Protracted communal conflicts across the country which have forced nomads to always migrate to safer areas thereby abandoning areas where schools were built to educate their children.
9. Inability of the teachers to speak the Fulani language (Fulfulde) making communication difficult between the teachers and the pupils.

The report presents the most current data on nomadic education in some northern states. Extracts from the data are summarized in Table 1.

The report also indicates that the program had either been completely abandoned or operating skeletally in Borno, Adamawa, and Jigawa states. In spite of all the challenges, some of the pupils who passed through nomadic schools have managed to acquire tertiary education. However, with this kind of report, there is a need to have a rethink over the whole concept of nomadic education based on empirical evidence about the success or otherwise of the program. This will allow for a critical decision on the need to continue with the program or seek an alternative to it.

The Almajiri children

The word "Almajiri" in Hausa language originates from the Arabic word "Al-Muhajir," which originally refers to the followers of Prophet Muhammed who migrated with him from

Table 1: Data on nomadic education in some northern states of Nigeria

State	Number of nomadic primary schools	Number of pupils		Total	Number of teachers
		Male	Female		
Bauchi	402	*	*	68,000	1174
Gombe	77			19,882	383
Jigawa	323	*	*	*	*
Kano	338	41,966	30,612	72,578	1417
Katsina	82	*	*	21,550	400
Plateau	136	*	*	29,791	720
Sokoto	80	*	*	12,500	185
Zamfara	62	4065	2439	6504	*

*Data not available from source. Source: Extracted from The Nation online newspaper, August 28, 2018

Science Education International
33(2), 156-162
https://doi.org/10.33828/sei.v33.i2.3

Mecca to Medinah in search of knowledge (Maigari, 2017). According to Babagana et al. (2018), Prophet Muhammed used the word to describe his followers who accompanied him on his migration from Mecca to Medinah. The word has evolved and is also used to describe anyone who migrates from one place to another in search of Quranic and Islamic education. However, in Nigeria, the most common perception of the word is its reference to young Islamic learners, especially in the northern part of the country who move around begging for food and alms on the streets. According to Yusha'u et al. (2013):

> In Hausa land, the term Almajiri could take any of the following forms: Any person irrespective of gender, who begs for assistance on the street or from house to house as a result of some deformity or disability; children between the age of 7 and 15 who attend informal religious school who equally roam about with the purpose of getting assistance or alms; or even a child who engages in some form of labor to earn a living. (p. 1)

So also, according to Babagana et al. (2018), Almajiri in Hausa land refers to children who are sent away from their homes into the care of Islamic teachers (Mallams) for the purpose of learning Islamic studies. The idea led to what is now called the Almajiri Islamic Education System. The idea dated back to the 11th century. According to AbdulQadir (2003), Borno and Sokoto Caliphates which were founded through Islamic revolution ran similar Quranic learning system which was later known as the Almajiri system. He stated that the original Almajiri system that operated during the pre-colonial days was such that allowed children to live with their parents and receive Quranic education from nearby schools, and the system was completely devoid of street begging.

The "destruction" of the Almajiri system began when the Britons invaded and colonized Nigeria. The position of the colonialists was that the system only caters for religious education. Hence, the system was no longer funded and this led the Mallams to resort to raising funds for personal survival and the running of the schools. We noted that, for selfish gains, the Mallams could no longer cater for the children's education. Therefore, they sent the children out to go beg for alms and bring the proceeds, and this is what has persisted up till date. Noteworthy, is the fact that the current perception of the "*Almajiri"* is a complete negation of its original connotation as a system of education.

The Almajiri phenomenon has brought a lot of stereotyping to the northern part of the country. The political leaders of the north have been accused of neglecting the children of the masses who constitute the body of the Almajiris. The Almajiris are seen on the streets, each one with a bowl or plate roaming around begging for food and money. They appear unkept most of the time; while some are sickly, dejected, weak, and vulnerable to all kinds of social vices.

The stereotyping that the menace of Almajiri brought to the northern elites led to the call for several conferences to address the issue. Yet, not much has been done by the state governors in the northern states. However, the Federal Government under President Goodluck Jonathan took the "bull by the horns" and established a comprehensive Almajiri Education Programme which sought to integrate the Almajiri Islamic Education System with the conventional western form of education. Hence, the Almajiri Education Programme law was signed by President Goodluck Jonathan on April 10, 2012, with a view to providing the Almajiris access to basic education (Taiwo, 2013). Consequently, the National Committee on Implementation of the Almajiri Education Programme was set up and tasked to integrate the Almajiris into the UBE Programme without prejudice to Islamic and Quranic studies. Between 2010 and 2015, 157 Almajiri (Tsangaya) Model Schools were established and equipped across Nigeria. The program was widely applauded and at inception was able to take thousands of Almajiri children out of the streets. Unfortunately, a report based on a comprehensive investigation by Amoo (2019) presents pictures of the abysmal conditions of these model schools today.

From Katsina to Sokoto, to Kano and Kaduna, the story is the same. Facility decay, abandoned functional facilities such as electric transformers, generators, and motorcycles, abandoned projects such as toilet facilities and staff quarters, and stolen property such as transformer cables were reported. The investigation further revealed lack of reading tables for pupils, dilapidated buildings, non-functional water storage tanks, broken doors, leaky and blown off roofs, damaged furniture, damaged ceilings, broken windows, and broken walls. Pupils were also found to be sleeping on bed springs without mattresses (Figures 2-5).

Specific to the teaching and learning of science, the report stated that no other facilities were found in the Integrated Science laboratory at Tsangaya Model Boarding Girls Primary School in Tsakuwa, Kano State, other than laboratory tables. This means that no science practical had ever been held in the laboratory. Laboratory materials meant for another school were however, found dumped at the Tsangaya Model Primary School in Harbau, Kano State. A more worrisome aspect of the report is that most of the schools investigated had no laboratories in

Figure 2: A typical hostel room in one of the schools. Source: Amoo (2019). Educeleb.com

Science Education International
33(2), 156-162
https://doi.org/10.33828/sei.v33.i2.3

Figure 3: A dilapidated office within the administrative block of the Almajiri Model School, Dutsin-Ma. Source: Amoo (2019). Educeleb.com

Figure 4: Pupils resting after some lessons under a tree in a local school

Figure 5: A schoolboy drinking unhygienic water from a dirty river

spite of the claims by UBEC that laboratories were part of the original plan of all the schools.

This report is a clear indication of a significant failure of the Almajiri Education Programme of President Goodluck Jonathan just like many other social programs that have failed in the past. It is characteristic of successive Nigerian governments to formulate very good policies and fail at implementation. Going by this report, the Almajiri Education Progamme has gone the way of other similar programs that did not yield the desired results. It means that the sustainability component of the program (if there was any) has failed. With the failure of this program, bringing science education to the doorsteps of the Almajiris has become a mirage unless efforts are made by the current government to reinvigorate the program and bring in technicalities that will ensure the sustainability of the program.

CONCLUSION

Based on this study's empirical evidence, this paper has been able to present the challenges faced in providing science education to two groups of disadvantaged children, namely, the nomadic children and the *Almajiri* children. The challenges that affect science education directly include:

1. Inadequate funding;
2. Insufficient/dilapidated infrastructure;
3. Truancy;
4. Parents' lack of interest in educating their children;
5. Language barrier between teachers and pupils;
6. Lack of or inadequate number of schools;
7. Lack of basic social amenities such as good roads, health facilities, pipe-borne water, and electricity;
8. Lack of science laboratory in some schools;
9. Lack of or inadequacy of laboratory equipment and materials for science teaching;
10. Poverty.

The paper has also revealed that while the reviewed intervention programs recorded some successes, they have not fully achieved their desired objectives due to defective policy implementation, lack of continuity, funding issues, and obvious corruption. To address these challenges, significant efforts are required from all stakeholders in education with specific focus on these groups of disadvantaged children so that they are not further denied basic education which is their constitutional right.

Recommendations

From the various reports and data available to the authors of this paper, the Nomadic Education Programme in Nigeria has recorded some successes but the objectives are largely yet to be achieved due to the myriad of challenges confronting the program. In ameliorating the challenges of nomadic education, a national policy framework that overhauls the entire concept of cattle rearing and fishing, which will confine herders and fishermen into specific communities, is advocated. This will afford these categories of people a permanent place of abode where education can be conveniently provided for them. This could, in turn, save government a lot of money and bring education closer to most of the nomads.

A general review and overhaul of the Almajiri Education Programme should be conducted by the Federal Government to resuscitate the program and give it the attention it desires

so that the teeming population of Almajiris are not further alienated from the education program of the country which can integrate them appropriately into the society.

Ethical Statement

No potential conflicts of interest were reported by the authors. Ethical considerations for this research study were observed to protect all individuals associated with this present study. Since there was no direct contact or interaction with human participants for this study, ethical concerns for harm to individuals were not an issue. This present study was free of any deception or research misconduct to avoid professional issues.

REFERENCES

AbdulQadir, I.A. (2003). *The Almajiri System of Education in Nigeria Today.* Available from: http://www.gamji.com/article5000/NEWS5956.htm

Aderinoye, R.A., Ojokheta, K.O., & Olojede, A.A. (2007). Integrating mobile learning into nomadic education programmes in Nigeria: Issues and perspectives. *International Review of Research in Open and Distance Learning*, 8(2), 1-17.

Amadi, D.C. (2015). Nomadic education in Nigeria: Using English to foster communal peace and enhance the education of the herdsmen. *Global Journal of Arts Humanities and Social Sciences*, 3(5), 16-21.

Amoo, A. (2019). *Investigation: Almajiri Schools Built by Jonathan Government Decaying Across Nigeria, West Africa*. Available from: https://wscij.org/remop/investigation-almajiri-schools-built-by-jonathan-govt-decaying-across-nigeria

Babagana, M., Idris, U.S.B., Ndagi, M., Danjuma, A.M., & Abdullahi, M.K. (2018). Assessment of Almajirin system of education: It's implication for child, family and national development in Minna metropolis, Niger State, Nigeria. *Research on Humanities and Social Sciences*, 8(4), 8-13.

Fafunwa, A. B. (2004). *History of education in Nigeria (Revised Ed.).* NPS Educational Publisher Ltd.

Iro, I. (2006). *Nomadic Education and Education for Nomadic Fulani.* Available from: http://www.gamji.com/Fulani7.htm

Jablon, P.C. (2020). Nomadic education and education for nomadic Fulani Nomadic education and education for nomadic Fulani. In J. Bazler, & M. Van Sickle (Eds.), *Cases on Models and Methods for STEAM Education* (pp. 55-91). IGI Global. https://doi.org/10.4018/978-1-5225-9631-8.ch004.

Maigari, Y.T. (2017). The Almajiri palaver in Northern Nigeria: How Islamic? *Saudi Journal of Humanities and Social Sciences*, 2(5), 396-404.

National Commission for Nomadic Education. (2019). *About the Commission. Nigeria: National Commission for Nomadic Education*. Available from: http://www.ncne.gov.ng/about-us

Olorundare, A.S. (2014). *Theory into Practice: Beyond Surface Curriculum in Science Education*. Ilorin, Nigeria: One Hundred and Forty Seventh Inaugural Lecture, University of Ilorin.

Osokoya, I.O., & Aminu, A.C. (2002). An impact evaluation of nomadic education programme in Nigeria. *Nigerian Journal of Clinical and Counselling Psychology*, 8(1), 25-42.

Oyelekan, O.S. (2016). Addressing the challenges of science education in Africa through a global lens. *The African Symposium*, 15(3), 112-123. Available from: http://tas.africanresearch.org/index.php/TAS/article/view/87/52

Schaffer, H.R. (2006). *Key Concepts in Developmental Psychology.* United States: Sage.

Stammler, F. (2005). *Reindeer Nomads Meet the Market: Culture, Property and Globalisation at the "End of the Land"*. Vol. 6. LIT Verlag Münster.

Tahir, G., Muhammad, N.D., & Mohammed, A.M. (2005). *Improving the Quality of Nomadic Education in Nigeria: Going beyond Access and Equity.* United States: Association for the Development of Education in Africa (ADEA). Available from: http://www.adeanet.org/clearinghouse/sites/default/files/docs/03_Nigeria_eng.pdf

Taiwo, F.J. (2013). Transforming the Almajiri education for the benefit of the Nigerian society. *Journal of Educational and Social Research*, 3(9), 67-72.

The Nation. (2018, August 28). *Nomadic Education, 30 Years after*. New York: The Nation Online Newspaper. Available from: https://thenationonlineng.net/nomadic-education-30-years-after

UNICEF. (2017). *Education: The Challenge.* United Nations Children's Emergency Fund. Available from: https://www.unicef.org/nigeria/education

Yusha'u, M.A., Tsafe, A.K., Babangida, S.I., & Lawal, N.I. (2013). Problems and prospects of integrated Almajiri education in Northern Nigeria. *Scientific Journal of Pure and Applied Sciences*, 2(3), 125-134.