

Science and Technical Education Beyond the Classroom: A Case Study of Mechanic Village, Abakaliki, Ebonyi State, Nigeria

C.E. Nwafor and Oka Obeten Okoi

Department of Science & Computer Education, Ebonyi State University, Abakaliki, Nigeria

Abstract: Science and technology education are virile means of achieving unprecedented national development, especially when harnessed rightly for optimum growth of the nation involved. The teaching, learning and practice of science and technology is the hub through which developed nations of the world control the rest of the comity of nations. A critical analysis of current trend of science and technology education reveals that there is continuous widening gap between the teaching and learning of science in the various higher institutions and its actual practice in the society. Common among these trend in Ebonyi State, is the gap between modern science and technology and its abysmal application in the Mechanic Village setup, Abakaliki. For science and technology education to be more productive for the State and the entire region, science and technology education must be taken beyond the classroom to the actual areas of application like the Mechanic Village setup Abakaliki. All hands must rise to this challenge to make science and technology education more practicable so that it will become more rewarding to the State and Nigeria at large.

Key words: Education • Mechanic Village • Technology • Science and Society

INTRODUCTION

Science, technology and the society are a complex whole. Each aspect of the relationship needs the other to thrive. From early beginnings, science and technology have developed into the greatest and most influential fields of human endeavour. Today different branches of science investigate almost everything that can be observed or detected, and science as a whole shapes the way we understand the universe, our planet, ourselves, and other living things.

Science is the mother of technology, that is why it is said that science is any system of knowledge that is concerned with the physical world and its phenomena and that entails unbiased observations and systematic experimentation (Encyclopedia Britannica, 2014).

Additionally, [1] sees science as the study of the natural things around us.

Science and technology have had a major impact on society, and their impact is growing geometrically. Science and technology have drastically changed our means of communication, the way we work, our housing, clothes, and food, our methods of transportation, and, indeed, even the length and quality of life itself. They have also

generated changes in the moral values and basic philosophies of mankind, bringing about modifications in how we live and what we believe. By making life easier, science has given man the chance to pursue societal concerns such as ethics, aesthetics, education, and justice; to create cultures; and to improve human conditions, but it has also placed us in the unique position of being able to destroy ourselves [2].

Science is the systematic study of anything that can be examined, tested, and verified. The word science is derived from the Latin word *scire*, meaning “to know” [3]. It is any system of knowledge that is concerned with the physical world and its phenomena and that entails unbiased observations and systematic experimentation. In general, a science involves a pursuit of knowledge covering general truths or the operations of fundamental laws. For a large part of recorded history, science had little bearing on people's everyday lives. Scientific knowledge was gathered for its own sake, and it had few practical applications. However, with the dawn of the Industrial Revolution in the 18th century, this rapidly changed [4]. Today, science has a profound effect on the way we live, largely through technology-the use of scientific knowledge for practical purposes.

Technology is a general term for the processes by which human beings fashion tools and machines to increase their control and understanding of the material environment. It is the application of scientific knowledge to the practical aims of human life. The term is derived from the Greek words *tekhne*, which refers to an art or craft, and *logia*, meaning an area of study; thus, technology means, literally, the study, or science, of crafting [5].

Many historians of science argue not only that technology is an essential condition of advanced, industrial civilization but also that the rate of technological change has developed its own momentum in recent centuries. Innovations now seem to appear at a rate that increases geometrically, without respect to geographical limits or political systems. These innovations tend to transform traditional cultural systems, frequently with unexpected social consequences. It is in this light that [6] opines that technology can be conceived as both a creative and a destructive process.

Society is the web of relationships and interactions among human beings; it is the sum of social relationships among groups of humans or animals. Society is a structured community of people bound together by similar traditions, institutions, or nationality; It is the customs of a community and the way it is organized, e.g. its class structure. From the foregoing, the society has reference to the culture of a particular people. [7] state that Anthropologists commonly use the term culture to refer to a society or group in which many or all people live and think in the same ways. Likewise, any group of people who share a common culture and in particular, common rules of behaviour and a basic form of social organization, constitutes a society. Thus, the terms culture and society are somewhat interchangeable. The society or culture constitute the patterns of behaviour and thinking that people living in social groups learn, create, and share. Culture distinguishes one human group from others. It also distinguishes humans from other animals. A society is aggregation of people's culture, which includes their beliefs, rules of behaviour, language, rituals, art, technology, styles of dress, ways of producing and cooking food, religion, and political and economic systems.

Science-Technology is a social process [8]. Social factors and Science- technology are intertwined so that they are dependent upon each other. This includes the aspect that social, political, and economic factors are inherent in science-technology and that social structure influences what science-technologies are pursued. [9]

pinpoints on this idea by speaking of the fact that in the late twentieth century, science, technology and society, science, technology and culture, technology and politics are by no means separate.

Science and Technology cannot be separated from ethnic practices. In a nutshell, what is known as "Science and Technology" today evolved from simple scientific and technological practices of different ethnic groups which overtime expanded due to continuous observations and discoveries. The human species has a unique capability for culture in the sense of conscious thinking and planning, transmission of skills and systems of social relationships, and creative modification of the environment [10]. The integrated patterns of behaviour required for planning and fashioning tools were accomplished by different ethnic groups long before western science, and some form of advanced code for vocal communication may also have existed at this time [11]. In a nutshell, no science or technology can ever exist or be sustained in an ethnic society that has no need for such.

Mechanics, in technical terms is the branch of physics concerned with the motions of objects and their response to forces [12]. As a profession, a mechanic is a skilled worker who is employed to repair or operate machinery or engines (Microsoft Encarta Dictionary, 2009).

The second definition (mechanic as a skilled worker) forms the core on which this paper is based.

The work of a mechanic is simply the application of technical knowledge of science to solving daily needs of people in automobile maintenance and repairs. In Nigeria, most of the vehicle maintenance and repair jobs are performed by roadside mechanics. However, as important as this role is to society, there is clear gap of divide between the learning of science and technology and the actual practice of it in the society and in different organised setups like the mechanic villages, Abakaliki.

Mechanic Village, Abakaliki: Mechanic Village, Abakaliki is the base of roadside automobile maintenance in Ebonyi State.

It is situated at Abagana Street, off Ogoja Road of the Capital, Abakaliki, which is located at about the mid of the South Eastern, Nigeria, latitudes 4°20' and 7°00'N and longitudes 5°25' and 9°35' [13]. Ebonyi State is in the South-Eastern Geopolitical Zone of Nigeria. It is located within 6°15'N 8°05'E, occupying 5,533 km² (2,136 square miles), with population (2006 Census) of 2,176,947, density of 390/km² (1,000/sq mi) (Wikipedia, 2018).



Fig. 1: Political Map of Ebonyi State. (Source: www.nigeriagallery.com)



Fig. 2: Location of Ebonyi State in the Nigerian Map.
Source: <http://upload.wikimedia.org>

The study area - Mechanic Village, Abakaliki is located 1500m from the central part of the town and about 200m to Abakaliki Rice Mill Industry [14]. Furthermore, Wilberforce opines that the mechanic village is characterized by beehive activities from 8.00 am in the morning to 6.00 pm in the evening. A section known as Motor parts is where people buy and sell different parts of vehicles. The remaining section is occupied basically by the four major identifiable groups such as (a) mechanics, (b) welders, (c) electricians and (c) panel beaters. The mechanics and electricians focus on repairing the mechanical and electrical aspect of the vehicles respectively. The welders and panel beaters fix damaged parts of vehicle. All these activities bring about the practice of science and technology in the setup.

Importance of Mechanic Village, Abakaliki: One must not lose sight of the importance of such setups in a developing Nation like Nigeria. Very crucial among the importance are as follows:

Guaranteed Continuity in Road Transport: The use of automobile vehicles on our roads plays a key role in road transportation system. In Nigeria where land transport (through automobiles) is largely in use compared to water transportation and other modes of transportation, the use of automobile vehicles, either diesel or petrol driven is predominant. However, the vehicles cannot remain new forever, as the parts breakdown and wear out, and so, must be maintained. The presence of this setup guarantees their continuous functioning for a longer period of time.

Revenue Generation: The Mechanic Village, Abakaliki, being a home for Small and Medium Scale Enterprises (SMSE) is a hub for revenue generation in the State. Payments are regularly made for tickets, workshops, environmental agencies, etc. These revenues assist in the repositioning of the State specifically, and the Nigerian society at large.

Job Creation: In a country where the unemployment rate is rising, a setup of this nature has engaged many youths. This, to a large extent reduces unemployment rate in the state and Nigeria at large as well as reduction in number of redundant youth who may have been engaged in crimes to fend for themselves. Such setups must be supported in all angles (even educationally) for it to move to the expected level where its impact can fully be felt in the society.

Science and Technology in Mechanic Village, Abakaliki:

There is a well-known adage that one cannot give what he does not have. Suffice it to say that one cannot act beyond what he knows. Such is the case in Mechanic Village, Abakaliki. The extent of scientific knowledge possessed by the skilled men in that industrial setup attest to the fact that science and technology education must move from the classroom into several setups of such nature scattered around the Nigerian society so that science and technology teaching as well as its actual practice may become meaningful to the society.

The continuous theorising of science and technology education in different institutions of higher learning against the continuous decay of its actual practice is a bane to the development of the Nigerian society. A simple look at such industrial setups scattered round about Nigeria will reveal to a large extent that that science and technical knowledge has largely been cocooned only in the four walls of the higher institutions of learning, with very poor application in the real society. There is the grave divide between science and technical conditions taught in the higher educations and their actual application in the real industrial setups in Nigeria.

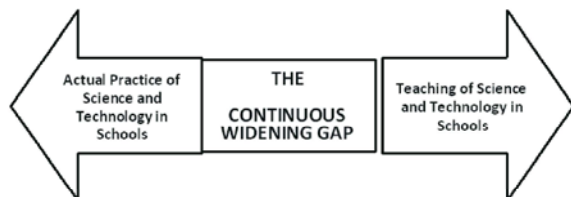


Fig. 4: The widening gap between science and technology in the classroom and its actual practice in the society

The above scenario must not be allowed to continue. For science and technical knowledge to be fully operational for the growth of the Nigerian society, it must be taken beyond the classroom to the actual fields where it is practiced.

A walk along the Mechanic Village, Abakaliki, will at a glance reveal how much scientific knowledge is neglected - health conditions are highly not maintained, environmental sanity is highly not practiced to the detriment of nature and in utter disregard to the tenets of environmental education, etc. Technical knowledge of simple machines is not also well applied and that accounts for the use of crude implements and even human force (muscles) in day to day activities in such industrial setups to get things done.

The continuous downplay of the actual practice of science in the society, especially in industrial setups like the Mechanic Village, Abakaliki is clear testimony to the science and technical advancement of the Nigeria Society. Nigeria cannot grow scientifically and technologically if science and technology is not made virile. A virile science and technology goes beyond the classroom situations to full scale practice - from the campus to the society that houses such citadels of learning. It must move from classroom to practical setups for it to be fully impactful to the society. Science and technology must go beyond the classroom to the sites of actual application in the society if the Nigerian society must share in the in its gains for national development.

The Widening Gap - in Brief: Some critical areas lending credence to the widening gap between science and technology in the classroom and the actual practice in the setup will, at a glance show the urgency of taking science and technology beyond the classroom to the society. Therefore, the following are some outcomes in the Mechanic Village, Abakaliki occasioned by the widening gap between the teaching of Science and Technology taught in the classroom and its actual application in the society:

Poor Working Conditioned: Some poor working conditioned occasioned by poor knowledge/application of modern science and technology are as follows:

Inadequate Tools: The use of inadequate/outdated/worn tools in the execution of jobs in the workshops lead car owners into unnecessary danger. Most of these technicians use tools of low quality because they cannot afford the high quality ones to enhance the proper fitting required. A critical consideration of this shows that such

is the case because of the level of scientific advancement and the technological know-how of the technicians in the mechanic village. The following basic maintenance activities go on in the mechanic village day by day with these crude tools: Brake Fluid, Engine Oil, Coolant, Power Steering/Transmission Fluid, Battery Fluid & Terminal, Vehicle Lighting, Air Filter, Tyre works, Panel beating, painting, engine works, etc.

Keeping in mind that these basic maintenance practices are on moving objects that make use of the road on daily basis, carrying people, goods and services from one location to another, one must consider that any mechanical fault occasioned by inadequate tools used on vehicles during maintenance may be very fatal to occupants of such moving vehicles as well as the general publics who either use the roads also in carrying out their normal activities and business around the roads and on those whose residences are around the roads. Having this in mind must compel every stake holder in the society to actually have a rethink on the plausible connection of increasing rates of accidents on the road usage to the level of maintenance given to vehicles at mechanic sites. The usage of inadequate/outdated tools in present day mechanic works is a direct consequence of the level of scientific and technological education and awareness in the mechanic village.

The above scenario is a compulsive reality that must propel the need for advanced science and technology taught in the classroom to be taught and enforced in setups like the Mechanic Village, Abakaliki in order that vehicle maintenance brings about vehicles that are road worthy and not death traps to its occupants and other road users.

Suffice it to say that automated/computerised vehicle diagnosis and repairs can also be a veritable option in the 21st century for safety vehicular maintenance. Science and technology education must go beyond the classroom to the actual places of application to correct this anomaly so that its impact can be fully harnessed and utilised for national development.

Inadequate Shades/Shelter/Structures: The world over, nations are getting concerned about global warming and its accompanying high intensity of direct sun rays on living things, especially man and animals. It is no long new that one basic advice to man is to endeavour to shelter himself regularly from the increasing high intensity of the sun, to avoid the dangers thereon. In disregard to this simple precaution, many mechanic outlets are nothing more than tattered shades, some even work under the sun without any form of shelter, reaping the adverse effects

thereof. Little do we wonder how effective jobs can be done on vehicles in such traumatising heat condition of the sun. This again is akin to the poor scientific knowledge possessed by many of these workers and to the general negligence of supervisory authorities to ensure that current best practices are maintained in the setup. This must not be allowed to continue. Science and technology must go beyond the classroom in order for it to be more impactful on the populace.

Inadequate Personal Hygiene Practices: In an advancing world where health is key to every action of man, it is often wondered why it becomes difficult to differentiate a lunatic from a mechanic on the road. The principles of personal hygiene are far neglected by a majority of auto technicians in the setup. There is vivid appearance of tattered and worn clothes, dirty clothes stained with oil and not washed for days or even months, exposure to oil and petrol into the body occasioned by the use of the mouth by many to suck oil or petrol from motor parts. It is also not difficult to find mechanics working or walking bare-footed within the setup. More so, the principles of handwashing before eating are often highly neglected thereby exposing many to health hazards occasioned by neglect of simple personal hygiene practices. One may wonder and ask: Do they really know the health implications? Or are they acting against what they know because it seems to be a norm for many in the setup? Regardless of which one is true, it calls for a repositioning of science and technology in the setup through teaching and supervision to ensure that personal hygiene standards are maintained. Continuous negligence on this can only be endangering the setup as well as the housing community to disease outbreak. Scientific knowledge on personal hygiene must go beyond the classroom to such areas to become more impactful.

Inadequate Attention to Precautions/ Instructions (Dependence on Apprenticeship Training for Professionalism): Scientific and technology educational background holds that every manual/instruction on a product must be read and understood before it is used. Not undermining the fact that most of the personnel in the mechanic village are poorly or not educated at all, yet the culture of reading and writing is critical to all and a ladder on which true application of science and technology can be attained. In an advancing world were science and technology continue to get sophisticated by the day, inability to read and write will adversely affect activities negatively.

This has caused a major setback in the setup in that most of the auto technicians are ignorant and not quite familiar with the advancing technological know-how of the trade and as such, pay less attention to instructions; some cannot read and write and so find it difficult referring to instruction manuals - they wholly depend on what they learnt during their periods of apprenticeship. This is not enough in an advancing world where new things are invented/produced on daily basis. Current trend even encourages auto technicians to become digital as most new fittings in modern vehicles will require looking up their operations in the internet before any meaningful job can be done on them.

The teaching of science and technology must go beyond the classrooms to this kind of setups for it to actually be more useful to the society.

Inadequate Attention to Health: The poor working conditions bring serious health challenges to auto technicians in the setup.

According to [15], a questionnaire-based survey was conducted among automobile mechanics and allied technicians in a semi urban city. Three hundred people were interviewed. The questionnaire sought information on health problems associated with work, the presence of chronic illness and where workers seek help when they fall ill. The interview was followed by an examination of the hands for dermatitis. Musculoskeletal disorders were the commonest work-related health problems reported by respondents. Of the 50 respondents who recorded musculoskeletal disorders, 27 (54%) had low back pain. Seventy-five (25%) of the respondents had signs of hand dermatitis: commonest among panel beaters and welders. Hand dermatitis and musculoskeletal disorders are the predominant health problems among automobile mechanics. Such was the case as far back as then. The situation has not changed today. Mechanics still work with crude tools and bare hands, exposing themselves to health hazards which can be avoided by just simple application of science and technology knowledge and precautions in daily activities. The study conducted by Wilberforce in the same mechanic village, Abakaliki showed that there is high pollution index in the area.

According to [16] based on high pollution indices (PI >1) of As, Cd, Ni and Pb, the presence of these heavy metals pose a risk to the health of the workers in these sections of mechanic village. He advised that if remediation of these toxic metals is not carried out, over a period of time the adverse effect of these toxic metals could become a serious public health concern to the workers there and to the entire hosting community.

Science and technology education must go beyond the classroom in order that it can make impact in the society. A repositioned health education in setups like the mechanic village, Abakaliki will be of immense benefit to the society.

Poor Environmental Conditions in the Setup: Most obvious among them are the following inherent problems of the setup to the environment due to poor level/application of scientific knowledge and technological know-how in the setup:

Pollution Occasioned by Oil Spills: Soil is an integral part for plant success. The research by [17] on the same mechanic village had earlier noted that it is evident from their study that the Abakaliki auto-mechanic site is gradually being contaminated with PAHs (phenanthrenes) arising from indiscriminate disposal of spent crankcase engine oils. They opined that as the city is expanding with more business outlay emerging, recycling and re-use advocacy is being recommended to track the spread of waste oils in the environment, pointing out that the risk associated with the PAHs components of the spent engine oils are grave and needed to be tracked and regularly monitored not only in soils but also in water, air, vegetables and other plants in the area. The extent to how much of this recommendation has been put to use is still a question of concern as not much has been done. This renders the land and water bodies around useless for agricultural purposes. Should there any need for relocation to some other place in future, the soil and water bodies would have been rendered barren for agricultural purposes. It will require a special clean-up if work is not done on time to curb the menace. The teaching and learning science but permeate into this area where it is practiced in order that precautionary measures may be taken to avoid the adverse effects associated with the wrong application/practice of science and technology.

Pollution Occasioned by Improper Waste Disposal: Open waste dump is a land disposal site at which wastes are disposed off in a manner that does not protect the environment, they breed vectors of disease, reduce the aesthetic values of the environment, cause nuisance and produce leachate which infiltrate into the hydrogeological system [18]. There are monuments of wastes in the area. Different sources such as garbages, spoilt foodstuffs, electronic goods, painting waste, used batteries, spoilt engines, vehicle chassis, seats, tires, tubes, among others constitute the bulk of the wastes discriminately disposed off in the mechanic village, Abakaliki. Dumping devoid of

the separation of hazardous waste can further elevate noxious environmental effects. One may actually wonder how much more of waste will be heaped in the area in the next ten years if not checked. Irreparable vehicles, parts, abandoned vehicles and a host of other unusable tools and equipment are packed at different locations in the area. The poor method of dumping and evacuation by waste in the area have made it possible for these waste to accumulate over time and deteriorate. This has led to the emission of odours and leachates from these dump sites. This monumental wastes not only result to land pollution but also water and air pollution which will pose health challenges to man, animals and plants.

A virile practice of science and technology in the area will consider the environment as critical and a stake in all actions. This calls for a proper repositioning of science and technology education in order that it might reach this needed site.

Pollution Occasioned by Chemical Deposition: The mechanic village, Abakaliki is not devoid of the use of chemicals in day to day activities.

Poor monitoring by special agencies to curtail the kind of chemical used in the setup is a bane to the health of her occupants and that of the hosting community, Abakaliki. The study on Accumulation of Toxic Metals in Soils of Different Sections of Mechanic Village Abakaliki, Nigeria and Their Health Implications has earlier revealed heavy deposition of chemical compounds in the area. According to the researcher, [19], there is high pollution indices (PI - Pollution Index >1) of As, Cd, Ni and Pb in the area. He noted that the presence of these heavy metals pose a risk to the health of the workers in these sections of mechanic village. He advised that if remediation of these toxic metals is not carried out, over a period of time the adverse effect of these toxic metals could become a serious public health concern to the workers there and to the entire hosting community. Another research work was earlier carried out by [20] on the same mechanic village noted that the results of their study also showed that phenanthrene and benzo[b] fluoranthene PAHs constituted the largest group of compounds with high concentrations in a typical soil sample in the setup contaminated with used engine oils, with the low molecular weight phenanthrene being more dominant with relatively lower concentrations compared to benzo[b] fluoranthene. He posited that it is evident from the results that the soils of Abakaliki auto-mechanic site were contaminated with PAHs at varying concentrations.

Suffice it to say that this metal deposition in the area pollutes not only the land, but the air as well as the water bodies. In times of rain, these metals are washed into water bodies thereby bringing about their accumulation not only in the land but also in the air as well as water bodies connected to the setup. This will definitely have adverse long term effect if not properly managed as quickly as possible.

In line with the above, a study by [21] on Evaluation of pollution status of heavy metals in the groundwater system around open dumpsites in Abakaliki Urban, Southeastern Nigeria concluded that the occurrence of various heavy metals such as iron (Fe), nickel (Ni), cadmium (Cd), mercury (Hg), manganese (Mn), lead (Pb) and arsenic (As) as major contaminants in the Abakaliki dumpsites has been established in their research. They recommended that resistivity methods of geophysical survey be carried out in the dumpsites to confirm the presence or absence of an impervious geologic layer underlying the dumpsites as this will assist in confirming whether these pollutants actually migrated vertically down to the groundwater zone or were transported from other areas - like the mechanic village.

Science and technology education must go beyond the classroom to the grassroots in order that it will become functional to serve the society in which it is taught.

Pollution Occasioned by Uncontrolled Emissions: The problem of epileptic power supply in the Nigerian society is no longer news. Consequent on this, all business outlets (small, medium or large scale) depend largely on private power supply for their day to day activities. The use of generating sets to generate power in the mechanic village is general to almost every outlet in the setup. In this regard, emissions are inevitable. Again, the testing and retesting of engines on repairs produces such great and uncontrolled emissions that continue to pollute the atmosphere of the area. Speaking on power matters, The Nigerian Voice (2013) has as a headline news - Ebonyi to provide facilities at new mechanic village to support artisans. In the words of the The Nigerian Voice, The Commissioner for Commerce and Industry in the state, Dr Ifeanyi Ike, announced the measure in Abakaliki while addressing members of the Nigeria Automobile Technical Association (NATA), The commissioner... said the state government would provide roads, electricity and water, among others, in the village. He said auto mechanics and other allied vocations were part of the small scale industries that fast-track the growth of a society and its

economy. While the last statement is true, the extent to which these amenities (which includes electricity supply) has been made stable in the setup is still of immense concern.

In a development, [22] reported that a tragedy struck at the Mechanic village Abakaliki, Ebonyi State capital as more than 15 shops with properties and wares worth millions of naira and about ten vehicles were burnt in an early morning fire. In response to the cause of the fire Christian Enwerem, a victim, narrating his ordeals noted: "We don't use electricity here, I have generating set to energize my workshop here and I always off it whenever I am through with what I on if for." This indicating that power was still an issue in the setup as at 2018 and artisans rely solely on their private power generating sets for their day to day activities. In such a situation, emissions cannot be lacking. Where emissions are not lacking, pollution cannot also be lacking.

The above calls for a virile science and technology education in the setup on current best practices to control emissions. Supervisory agencies like the ministry of environment must ensure that these current best practiced are maintained to salvage the ecosystem.

Summing up the above pollutions in auto technician sites, [23] stated that the increasing number of malfunctioning automobiles with subsequent increase in emission levels and waste handling is an environmental concern in Nigeria. Accordingly, they stated that the spills from lubricants, gasoline, diesel and by-products of used and spent engine oil constitute the major pollutants in auto mechanic villages in Nigeria. Its environmental pollution has been predominant through soil and groundwater contamination and poses a major anthropogenic threat. In their study, they revealed that the studied heavy metals on contaminated soil showed that studies had focused on common metals of Cu, Cd, Pb and Zn in the east and west regions, while trace metals were studied in the south and radioactive elements in the north.

Statistical evaluation showed high occurrences of Cu, Cd, Pb and Zn in the four geo-political zones of Nigeria. The detrimental effects of auto-mechanic village activities were on humans and also disrupted growth and flowering of arable plants. The remediation application showed that soil type and contaminant characteristics play a major role in determining the type of remediation procedure to be applied. [24] further stressed that these contaminations are mainly as a result of anthropogenic activities especially from automobile servicing and seems to cause heavy metal pollution load in soils around mechanic village.

Hence, Nigeria should provide standard repairs and services to automobiles in line with emerging technology and best environmental practices.

The Society and the Setup: It has earlier been noted that science and technology cannot be practiced outside a society. The extent of science and technology in any given society depend largely on the level of patronage, support and interest from the given society in which it operates. Hence [25] pinpoints that science-technology is a social process. In a nutshell, no science or technology can ever exist or be sustained in an ethnic society that has no need for such. Common among these social relationships between the mechanic village and the hosting community are [26]:

Disregard of Auto Technicians Due to Outlook: It is of commonplace that you may hardly differentiate most of the technicians from mad men in the streets. They are also dirty, tattered and in rags. This makes the society treat them often as lower class citizens. This accounts for why most of them are often underpaid, even after a laborious effort to fix a vehicle. A repositioned retraining can help them understand the impact of their outlook on their job as auto technicians. As an addendum, structural modification for better working conditions can improve their outlook and make them more presentable.

Location: The location of the setup stands to be another major setback from societal patronage. A walk through the town will show that there are countless mini auto technicians workshops scattered around the town. The reason is not far-fetched - the location of the setup is far from the easy reach of populace. In light of this the society basically patronizes the setup only on major repairs. A well-located workshop allows for accessibility and visibility.

Support and Incentives: Most auto technicians interviewed have a very low working capital. Some wished they could start spare parts business but cannot do so due to lack of fund. This also implied that most auto technicians' workshops are of low standard because of low capital base. Many of the technicians established workshops can best be described as oil changing centres. The Government, as well as the general public has not seen the need to support this setup to make it of world class standard for higher revenue generation. There is observable bad road network in the area, occasioned by

poor support from the society. Science and technology education must go beyond the classroom in order that it may be meaningful to the society and as well, for the society to fully relate with those who practice it for the solving of their day to day needs, in this wise, auto challenges.

CONCLUSION

Science and technology education is critical to nation building. For science and technology to bring about the needed national development, it must go beyond the classroom setting to the actual application areas. Mechanic Village Abakaliki is a viable place for the practice of science and technology. The society (Ebonyi State, Abakaliki precisely) must as a matter of urgency provide the needed support and incentives to turn the setup into a world class industrial centre for employment and revenue generation in the state.

Recommendations: Based on the study, the following recommendations are made:

- Auto technicians in the setup should be educated through the organization of seminars/ workshops, exhibitions and the likes for them.
- There should be regular retraining of auto technicians so that they might always be abreast of the ever changing science and technology.
- Improved health and safety education programmes aimed at eliminating hazardous work practices such as sucking of petrol and poor lifting techniques should be organized for them regularly. This will aid in improving the health and safety of their workforce.
- Government/willing individuals should embark on the development of the mechanic village that should be let out to auto technicians at a subsidized rate.
- However, government should enact laws restraining any auto technician from operating repair centre outside a mechanic village. This will solve some of the problems they are facing on acquisition of land facility and other necessary facilities for their workshops.

Such setups should be planned to accommodate improved panel beating, modern painting techniques and digitalised auto electricians as analysis had revealed that when together, their productivity and efficiency are better.

- Also, availability of spare parts and easy access to spare parts market should be taken into consideration when determining the location of such setups.
- The setup should consider ways and means to facilitate the provision of certain expensive facilities required for increased productivity that could be shared for use among the occupant of the setup. This can be easily achieved as people within the same setup can join together to procure expensive equipment and other facilities that are of mutual benefit.

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