

The role of quality technical education for technological advancement in Nigeria: The interface

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Abstract - The purpose of this study is to evaluate the quality of education provided as regard technical education in relationship to technological advancement in Nigeria. The study was carried out in three public technical colleges in Ondo state. The population of the study comprised all students and staff of the three government technical colleges in Ondo State. Two instruments were used for data collection. The instrument for data collection was a self-structured questionnaire. Drafted copies of the questionnaire with a total of forty items were validated by three experts, and one specialized in measurement and evaluation. the test-retest method was used to ascertain the reliability of the instruments. The instrument was subjected to a reliability test using an estimate of internal consistency developed by Pearson product moment correlation (ppmc). The overall reliability index for the instrument was 0.88 and therefore deemed reliable. One hundred and three (103) copies of the questionnaire were administered to the respondents by the researcher and with three research assistants. percentage, mean and standard deviation were used to answer research questions. For decision to be reached regarding the mean, the upper and lower limits of the mean were adopted. Finding showed that lack of qualitative technical education hampered the technological advancement and deprived Nigeria from joining the league of developed nations because quantity is replacing quality. Therefore the following recommendation were made; the federal government and state should consider siting technical colleges in each local government areas just as it has unity colleges and higher institutions across the states that will serve as models in times of quality; emphasis must be placed on skills acquisition and technological advancement at all levels of our technical education to produced graduates that do not just have the certificates but skills; funding of technical schools should meet up to UNESCO recommendation of 26%.

Keywords: quality education; technical education; technological advancement; interface

I. INTRODUCTION

From generation to generation, time changes affecting the way people live and their society as well as technology. This change in time prompts new inventions and technologies. This call for

education at any level and time must be given maximum consideration towards the formation of necessary skills needed by individuals' life. Education is an investment that its dividend does not come about immediately. Fazilah et al (2011) assert that education is more than an economic investment: it is an essential input upon which life, development and the survival of man depend. This position is shared by Mailun and Mimi (2019) who says education is a strategic investment in national development. Education was described by Jacob and Gladys (2019) like investing in the foundation of a multi-storey building that consumes a lot of resources, yet its state of progress may not be visible because the foundation is buried underneath. In other for structures which are raised on hidden foundations, but visible to all, not to collapse, there is a need for the foundation not to be neglected no matter the resources it will demand or consume. This assertion is in agreement with Fazilah et al (2011) who said education is generally seen as the foundation of society which brings economic wealth, social prosperity and political stability. Arundhathi et al (2016) state that education is a most powerful weapon one can use to change the world and for self-enlightens.

Therefore, the purpose of education at any level has been to empower and impact skills and knowledge in learner. Education been an instrument for individual's development, technological advancement and that of his society should be the one that geared towards quality learning that help ones provide food for his family. This is in line with assertion of Akomolafe & J, and Kazeem (2022; Song & Nfu, 2023) that education gives insight into national and international issues, grooms individual personality, inculcates moral values, add knowledge and fortify individuals with necessary skills to deal with life's challenges. These imply that the kind of education we operate will in turn determine the level of our technological advancement. This is because as noted by Thom-otuya et al (2016) that "Education is the veritable instrument for generating all genre and levels of manpower in any nation". Education as an investment that bring untold dividends to the society, but if that investment is not properly made or is made inadequately, the society suffers a loss. Therefore, quality education begets quality accelerated technological advancement as this form the focus of this paper.

Quality technical education is a necessity to a sustainable technological advancement of any nation. From the beginning of human existence, technology has progressed and has continued to evolve. As a result, technical transformation is critical to economic growth since the proper or incorrect application of technology advancements can have significant-good or negative consequences for a certain organization, industry, or nation (Ahmed, 2021). Technological advancements brought to the world innovations that have economic linkages that bring social progress. Therefore, provision of quality technical education to the society will inspires creativity and innovation, moreover improves the nation's technology and economy. The failure to invest in quality of education offered to pupils threatens the long. There must be synergy between quality technical education and technological advancement that requires the interface of both. This is because quality education is a veritable tool for technological advancement and transformation of a society to a greater height, therefore no nation can be well advanced technologically above the quality of education its citizenry received. This assertion correlate Linda (2013) that said quality education entails learning resources, technology, program enrolled, modulus done, lecturing methodology, attachments, qualifications, co-curricular activities, performance awards, students and lectures perspective in the institutions operating management also their opinions and appraisal toward education.

Quality technical education refer to the ability of the school to provide the necessary facilities required to aid teaching and learning that can lead to the achievement of educational goals in his with prescribed acceptable global standard (Mailun & Mimi (2019). The quality of technical education provided may determine the technological advancement of the nation. Kenyatta (2015), President of the Republic of Kenya said that provided quality education brings about a glittering future to individuals, society and whole world at large. Technical graduates who acquire quality skill and education from their respecting technical colleges are most likely to be employable.

A quantum of research studies in Nigeria has emphasized the poor quality of education in technical colleges system. Technical education as defined by Shirka (2008) is a type of education made up of theoretical and practical instructions given to those who wish to be employed in commerce and industry or any type of enterprise that requires the use of tools and machinery for operation, production and distribution of goods and services. The moribund condition of our technical education institution in Nigeria calls for government and relevant stakeholder attention to ensure sustainable technological advancement. Adedipe (2013) and Ijaiya (2012) observed that graduates are unemployable because of the following reasons including dilapidated facilities for effective teaching and learning, ill-equipped laboratories and libraries for proactive and pragmatic learning outcomes, poor staffing, inadequate teaching and non-teaching staff for effective teaching and learning.

Many scholars also, have written widely on the fallen standard of education in Nigeria with emphasis on certain factors responsible such as: inadequate funding, lack of teaching and learning instructional materials, non-equipped laboratory, wrong policies, poor laws and regulations, wrong curriculum, lack of adequate qualified personals, inadequate infrastructure, and lack of interest from some learners among other. With quality technical education technological advancement is sure in Nigeria because quality education is one that welcomes the learner and can adapt to meet learning needs. More also the quality of education provided by institutions however may vary based on multiple factors, the teaching system, programs provided, quality of lecturers, and the learning environment under which the education is being provided (McAleese, 2013). Obasi (2010) on his own part identifies four (4) indicators of quality education which are: Effective and efficient performance of graduates in the society, Employability, Level of discipline and patriotism of graduates and High rating of an institution/school and its products nationally and internationally. The spate of decrease in quality of technical education in Nigeria has been worrisome.

The concern is that products of these technical colleges of learning seem that are not trained with the skill sets to contribute to technological advancement of the nation. Lawal and Ababi (2022) asserted that the country has not been able to record enough success in technological development and economic advancement because graduates chum out are half-baked and are essentially equipped with theory without being able to translate into practice. This implies that the quality of education that we make an individual independent and survive economically has not been effectively developed in the nation. Education that train and culture the mind of individual to acquire appropriate skills meant for technological advancement that transform the society to economy sustainability should be provided by any nation,

Education been a driven force for national, technological and economy development must be of a quality one. However, if there is a lack in quality of education provided this would affect factors such as entrepreneurship, creativity, innovation, technology and employability. The students should possess some unique skills which make them eligible for the job which is possible only through quality education (Pavel, 2012). There is no gain saying the fact that the quality of education is determinant of technological advancement of the society. Due to the rapid growth of global economy, education has become an imperative aspect for innovation, growth and development. Investment in education is investment in human capital, and lack of the former equals a lack of the latter (Michael, 2010). Therefore, the quality of education should be paramount so that values and positive orientations could be inculcated into the life of the able-bodied youth in our society. This may prevent spate of violent crimes such as knapping, banditry and armed robbery which is the resultant effect of poor-quality education. However, quality education is crucial for technological advancement in Nigeria. Technologically Nigeria is not advanced because emphasis is placed on paper qualification.

The purpose of this study is to evaluate the quality of education provided as regard technical education in relationship to technological advancement in Nigeria. The ideology of many developing countries is to be self-sufficient and to produce products in their own industries. That led to Nigeria national policy on education that gave birth to 6-3-3-4 system of education in 80s which emphasis on self-sustainability. Therefore, this lay a good beginning that

quality education is a must in our technical colleges for exploration of technicians to the production industries. This will assist the growth an exporting country in numerous fields, producing experts capable of working in production industries and construction firms. Also, this study seeks to discover if quality of education affects the technical skills and employability of graduates of technical colleges and seeks to uncover the quality of technical education in technical colleges and other similar institutions and if there are challenges, shortcomings, suggest ways to improve on quality in learning. This will benefit the policy makers, the school management, students of technical colleges and the society at large. Therefore, this research is to find out to what degree does technical colleges takes efforts to provide quality technical education to their students for technological advancement.

The purpose of education is to empower and impart skill and knowledge in learners. Therefore, the education one get has to be of certain quality. Challenges of quality education may be of shortage of resources (Human and Materials), cost, time and commitment. There is serious need for quality education and for this to take place; such obstacles already stated must be addressed because Nigeria cannot remain in this type of low quality in education. In addition, the main problem may be that lack of awareness of necessities of offering standard technical education. Technical Education is the bedrock for technological advancement but in Nigeria there is a wide continuum between the two as the reality on ground still proves that we are still far from actualizing this. Lack of quality technical education in our nation continues to stare at our faces with indices such as: high rate of Nigerians youth unemployment. Hence, quantity is replacing quality. Quality is not anything sub-standard but anything that has degree of high rating. Therefore, it is vital to investigate if there is provision of quality technical education in technical colleges to meet this mission to enlighten the society and individuals which is the intension of this research. The study seeks to find out how far technical colleges facilitate quality education for technological advancement in Ondo State.

The objectives of the study are to (1) find out the degree of educational resources provided for technical education in terms of quality for technological advancement. (2) find out the constraints against quality technical education for technological advancement.

The following research questions guided this study (1) What is the degree of educational resources provided for technical education in terms of quality for technological advancement? (2) What are the constraints against quality technical education for technological advancement?

II. METHOD

The research design adopted for the study was a survey. The study was carried out in three public technical colleges in Ondo State. The population of the study comprised all the staff and students. There was no sample in the study. Two instruments were used for data collection. The instrument for data collection was a self-structured questionnaire. Drafted copies of the questionnaire with a total of forty items were validated by three experts, and one specialized in Measurement and Evaluation. The test-retest method was used to ascertain the reliability of the instruments. The instrument was subjected to a reliability test using an estimate of internal consistency developed by Pearson Product Moment Correlation (PPMC).

The overall reliability index for the instrument was 0.88 and therefore deemed reliable. 103 copies of the questionnaire were administered to the respondents by the researcher and with two research assistants. Percentage, mean and standard deviation were used to answer research questions. For decision to be reached regarding the mean, the upper and lower limits of the mean were adopted. Means below 2.50 is regarded as low level and above 2.50 regarded as moderate. In section I, respondents answered questions on a modified scale of Highly Provided (HP), Provided (P), Not Provided (NP) and Highly Not Provided (HNP). For questions on Constraints against Quality technical Education scale of Strongly Agree (SA), Agreed (A), Disagree (D) and Strongly Disagree (SD) representing values of 4, 3, 2 and 1 respectively was employed. The decision that an item is provided or not Provided, Agreed, or Disagreed as the case may be was taken on the mean of 2.50. Mean and standard deviation were used to answer the research questions.

III. RESULTS AND DISCUSSION

Research Question 1: What is the degree of educational resources provided for technical education in terms of quality for technological advancement?

Table 1 Mean and Standard Deviation of responses on educational resources provided for technical education in terms of quality for technological advancement

S/N	Degree of educational resources provided in terms of quality	Highly Provided	Provided	Not Provided	Highly Not Provided	X	SD	Remarks
1	Availability of blackboard	21	70	6	6	3.00	0.85	Provided
2	Provision of E-library,	13	10	50	30	1.36	0.74	Not Provided
3	Qualify and enough technical teachers	11	12	45	35	1.90	0.87	Not Provided
4	Learning materials provided	10	13	50	30	1.66	0.80	Not Provided
5	Availability of Wi-Fi/internet for research	5	8	20	70	1.45	0.76	Not Provided
6	Co-curricular provided by college enough for improvement in Studies	8	13	45	36	1.67	0.78	Not Provided
7	Hard copy journal and online journals provided	7	9	44	43	1.40	0.88	Not Provided
8	The books provided are relevant to the courses description	20	23	35	25	1.67	0.69	Not Provided
9	Availability of text books.	21	13	47	25	1.38	0.84	Not Provided
10	Availability of radio programs to stimulate learning	3	4	46	50	1.45	0.78	Not Provided
11	Provision of Audio-visual garget for class instruction	3	3	47	50	1.65	0.76	Not Provided
12	Availability of animations and images for teaching	6	8	61	28	1.86	0.84	Not Provided
13	Overhead Projector Transparencies in the class	4	5	46	50	1.60	0.68	Not Provided
14	Computer Software and Apps for students used	8	9	46	40	1.90	0.87	Not Provided

15	learning materials get are of quality oriented	7	6	57	43	1.66	0.80	Not Provided
16	Relevant tools provided for learning	5	7	43	58	1.45	0.76	Not Provided
17	Relevant Machines in the workshop provided	9	8	46	40	1.67	0.78	Not Provided
18	Energy such as electricity and solar power available	6	8	61	28	1.40	0.88	Not Provided
19	Inadequate funding	4	5	46	50	1.67	0.69	Not Provided
20	Course duration is enough to have all knowledge required	8	9	46	40	1.38	0.84	Not Provided
21	Workshops and seminars organized for interaction	7	6	57	43	1.45	0.78	Not Provided
22	providing necessary skills to be an employable graduate	5	7	43	58	1.90	0.87	Not Provided
Grand Mean						1.66		

The data presented in table 1 above revealed that the degree of educational resources provided for technical education in terms of quality is negative from the mean scores of the responses of staff and students. Using 4-point rating scales of 2.50 Cut-off as the criterion mean, all values less than 2.50 are not provided while all values equal to or greater than 2.50 are provided. The mean value of item 1 is provided while those of item 2-22 are not provided. Since majority of the respondents agree to the fact that those items are not provided, it can be deduced that the degree of educational resources provided for technical education are highly not provided in terms of quality for technological advancement in Ondo state.

Research Question 2: What are the Constraints against Quality technical Education for technological advancement?

Table 1 Mean and Standard Deviation of responses on the Constraints against Quality technical Education for technological advancement

S/N	Constraints against Quality technical Education	Strong Agree	Agree	Disagree	Strong Disagree	X	SD	Remarks
1.	Inadequate funding	44	43	6	10	3.75	0.72	Agree
2.	Lack of qualified teachers	43	47	7	6	3.85	0.66	Agree
3.	Inadequate infrastructural facilities	47	45	6	5	3.67	0.83	Agree
4.	Poor education policy	6	7	50	40	1.94	0.02	Disagree
5.	Poor policy implementation	45	35	10	13	3.54	0.98	Agree

6.	Examination malpractice	50	30	10	13	3.75	0.76	Agree
7.	Poor reading culture	50	40	4	9	3.85	0.88	Agree
8.	Lack of conducive teaching and learning environment	49	39	7	8	3.66	0.85	Agree
9.	Ineffective quality control to ensure standard	44	43	11	5	3.70	0.76	Agree
10.	Insufficient classrooms/staff quarters	50	30	13	10	3.45	0.95	Agree
11.	Lack of good motivation of staff.	45	35	12	11	3.56	0.83	Agree
12.	Inadequate equipment for practical teaching	50	45	5	3	4.00	0.94	Agree
13.	Lack of teaching aids	44	43	7	9	4.20	0.90	Agree
14.	Teachers' poor attitude to work and lack of interest in teaching.	38	40	12	13	2.85	0.76	Agree
15.	Supervisors lack training in supervisory competencies	47	35	13	8	3.00	0.81	Agree
16.	Poor remuneration of teachers	46	50	4	3	4.50	0.89	Agree
	poor conditions of service which reduce their commitment to teaching	47	50	3	3	4.00	0.95	Agree
17.	Poor States accorded to teachers which dampen their morale and job satisfaction	46	50	4	3	4.40	0.88	Agree
18.	Presence of a large member of untrained and unqualified teachers in the school system.	57	43	2	1	4.56	0.98	Agree
Grand Mean						4.00		

The data presented in table 2 above revealed that the constraints against quality technical education are positive from the mean scores of the responses of staff and students. Using 4-point rating scales of 2.50 Cut-off as the criterion mean, all values less than 2.50 are not provided while all values equal to or greater than 2.50 are provided. The mean value of item 4 was disagreed while those of item 1-3 and 5-18 were agreed. Since majority of the respondents agree to the fact that those items were constraints against quality technical education, it can be deduced that the constraints itemized can against quality technical education for technological advancement in Ondo state.

The finding of the study revealed that the perception of teachers, students and technical staff on the role of quality technical education in technological advancement in Nigeria is positive. This implies that the teachers, the students and the technical staff are aware of the significant importance of quality technical education in technological advancement in Nigeria. British Council (2014) supported that Quality education provided to the society inspires creativity

and innovation, moreover improves the nation's economy. Quality technical education programs are identified as those in which students learn many of the technological skills that help them participate in world of technology.

The rapid growth of manufacturing and technical jobs worldwide nations would face a challenge in being economically competitive if the graduates produced do not meet international standards because of lack of quality technical education. With regard to Pavel (2012), who said that students should possess some unique skills which make them eligible for the job which is possible only through quality of education. Furthermore, students need quality education, because investment in education is investment in human capital, and lack of the former equals a lack of the latter (Albada et al., 2021). Quality education equips one with capability to interpret things rightly and applying the gathered information in real life scenarios. This opinion is agreed with by Edutopia (2005). who say to tackle the lack in quality of education, tertiary institutions (Technical colleges) should engage, project based learning where students get to learn hands-on, this would insure that they learn beyond context of text-books.

IV. CONCLUSION

Education plays a significant role in achieving a good quality of life. Lack of qualitative technical education on the other hand, has hampered the technological advancement and deprived Nigeria from joining the league of developed nations and has remained a developing nation for many decades now. To build a nation that is technologically inclined, the citizens need to have qualitative technical education. Quality technical education will propel technological advancement, social and economy development in Nigeria. Thus, technical education is major aspect of development of any modern society since if there is a deficit of educated people then society will stops its further progress technologically. Therefore, all hands of the stakeholders in the educational sector must be on deck to ensure that Nigeria recovers from technological slumber in order to achieve technological advancement.

RECOMMENDATIONS

The authors therefore wish to put forward the following recommendations based on the foregoing as essential points to consider in enhancing quality technical education for technological advancement.

The federal government and state should consider starting technical colleges in each local government areas just as it has unity colleges and higher institutions across the states that will serve as models in times of quality.

Emphasis must be placed on skills acquisition and technological advancement at all levels of our technical education to produced graduates that do not just have the certificates but skills.

Funding of technical schools should meet up to UNESCO recommendation of 26%. To meet myriad needs of technical education ranging from lack of infrastructure, inadequate trained personnel, lack of conducive environment for learning, lack of well-equipped library, poor salary and motivation of teachers just to mention but a few.

Review the education policies and curriculum to meet the contemporary technological demands of society. Technical education graduates must be that that can handle modern equipment and gargets that are in use in other parts of the world.

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