

BEST PRACTICES IN INDUSTRIAL TECHNOLOGY EDUCATION AND TRAINING AND STUDENTS SKILLS ACQUISITION IN AN ERA OF ECONOMIC UNCERTAINTIES IN NIGERIA.

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Abstract

Industrial technology education and training provides employable skills, attitudes and creative abilities necessary for effective and efficient performance in the world of work. This kind of education is an important tool in the hand of Government to curb most of the social vices in our societies. Hence, it provides skills and competence for self-reliance. Therefore, the best practice in Industrial Technology Education in an era of economic uncertainties would provide the students with adequate skills for economic challenges and way forward in Nigeria are gross inadequate. Based on this premise that the study was conducted to determine the effect of best practices in Industrial Technology Education in an era of economic uncertainties in Nigeria. The survey research design was adopted for the study. Four research purposes were formulated for the study and four hypotheses were postulated and tested at .05 level of significance. One hundred and ten final year students from the Department of Vocational and Technology Education, University of Cross Rivers State and Department of Industrial Technology Education in University of Uyo constituted the population for the study. Independent t-test and Pearson product moment correlation coefficients were used to test all the hypotheses at .05 level of significance. The study shown that there is significant different between equipment available and equipment needed for the teaching/learning, except institutional and industrial relationship that shows that there is no significant relationship between institutions and industries for training in tertiary institutions for overcoming the economic uncertainties in Nigeria. Based on the findings the study concluded that the skills acquired by industrial Technology Education and Training graduates will soon become obsolete with the programme skills expected tackled the challenges in an era of economic uncertainties and if adequate measures are not taken by the institutions management to equip the students' workshops with modern equipment and the needed environment for teaching/learning and partnering with the 21st century workplace in planning and reviewing her curriculum. It would amount to producing industrial technology education and training graduates that may be unemployable and this will increase more, the rate of unemployment that may lead to more social vices in our societies. The following recommendation were also made; that tertiary institutions offering the programme should upgrade and standardize their teaching and training workshops, provide the conducive environment and partner with industries for graduates of the programme to acquire the modern skills, knowledge and competence for the 21st century economic uncertainties in Nigeria and workplace. Institutions and industries should have effective partnership for teaching and learning Industrial technology education and training graduates.

Keywords: Best Practices, Industrial Technology Education and Training, Economic Uncertainties.

Introduction

One of the major factors that can bring about economic development is a functional human capacity building. Building a functional human capacity involves education and training designed to provide the individual with, skills and attitudes related to occupations in various sectors of economic and social life in an era of economic uncertainties. Economic challenges and way forward are concerned with the exploitation of human and materials resources, the direction of involvement, the orientation of technological development and institutional change that are in harmony with, and enhance both current and future potentials to meet human needs and aspiration Oviawe and Uddin (2017).

The increasing importance that Nigerian Government attach to industrial technology education is reflected in various strategic papers that government has develop in recent times. Therefore, other countries; according to Afeti (2006) that embrace industrial technology education for economic growth and national development. Cameroon for example develops industrial and technology education and professional training to facilitate integration in the labour market, Cote d'Ivoire strengthened industrial training, Ghana linked industrial technology and training with education of the youth and the entrepreneurial skills, Malawi emphasised the need to promote self-employment through skills development. The 21st century world according to Ovigwe and Uddin (2017) is a world that is very different from the one in which we were educated. It is a world that is dynamic with technological development, advancement and economic uncertainties. The rapid advancement in technological development has placed new demands for the 21st century workforce whose products of industrial technology education are prepared for serve.

Okoye, Okwelle and Chidioke (2014) viewed industrial technology education it's then a formal training that enable application of technologies of applied science and mathematical principles for the services of

mankind. Industrial technology education nurtured skills and practical development of an individual. Industrial technology education is asserted as the comprehensive term referring to those aspects of the educational processes involving the study of technology and related sciences and the acquisition of practical skills, attitudes, understanding and knowledge relating to occupation in various sectors of economic and social life. (NPE. 2014)

Industrial technology education provides practical skills, know-how and understanding necessary for employment in a particular occupation, trade or group of occupations or trades. Ekpenyong, (2005) states that industrial technology education and training is not only about knowing how to do things but also understanding why things are done in a particular way. Aliyu (2009) states that industrial technology education is offered in primary, secondary and tertiary institutions of learning and it is expected its best practices should be observed.

Best practice can be defined as a method or techniques that have consistently shown results superior to those achieved with other means, and that is used as a bench mark to improve standard of a profession or organization. Best practice are used to maintained quality as an alternative to mandatory legislated standards can be based on self-assessment or bench marking. Best practice is a future of accredited management standard. It is also the result of an organisational service, function or processes which, when applied to a particular setting, achieves the desired outcome and to meets or exceed a bench mark for a standard. In a simple way best practice which is a strategic management terms means a template of standardization of a given profession or organization. It could also be referred to as quality assurance for a given profession or organization. Best practices in education are an inherent part of a curriculum that exemplifies the connection and relevance identified a educationally (Daniel and Bizar, 1998) they speak's firmness into curriculum

by developing thinking and problem solving skills through integration and active learning.

Adebile (2014) stated that best practices motivate, engage and prompt students to learn and achieve, and possess the knowledge, skills and abilities to transfer and connect ideas and concepts cross disciplines will be able to fit in and succeed the 21st century economic challenges in the world of work. Best practices in teaching industrial technology education and training is referred to what the government professional and teachers can do to improve or standardize the technology and learning industrial technology education and training. Precisely, best practice includes the provision of adequate equipment in learners' physical workshop, environment of workshop, physical needs of the learners, exposure of learners to the targeted industrial dynamic and effective use of tools and institution industrial partnership for students' skills acquisition.

Economic uncertainties in Industrial Technology Education and training can significantly impact both the field and its stakeholders, including students, educators, institutions, and employers. This can lead to skill gaps if educational programmes cannot keep pace with changing industry requirements. It will affect the competitiveness of the workforce and the ability of industries to innovate and grow. Economic uncertainties can accelerate shifts in industry demands, necessitating changes in the curriculum. Industrial technology educational Programmes may need to quickly adapt to teach new skills or technologies that are in demand due to economic shifts. Economic uncertainties in Industrial Technology Education require proactive strategies to ensure that programmes remain relevant, adequately funded, and capable of preparing students for the challenges of a dynamic economic environment. Collaboration between educational institutions, industry, and government, along with innovative approaches to curriculum design and delivery that can help mitigate the effects of economic uncertainties in an era in Nigeria

Statement of the problem

Young men between the ages of 17 – 35 constitute the larger population in Nigeria as asserts by the Nigeria's national economic development policy in 2001. The teeming young men secure admission into tertiary institutions yearly and graduate yearly too, ready for employment in government establishment. Unfortunately there are no longer vacancies for employment in government establishments. This situation increases the rate of unemployment, poverty and social vices which hinders the national economic development and growth. The problem prompted the government to begin to rely on industrial technology education and training in institutions of learning as tools to reduce the rate of unemployment, poverty and other social vices. It is observed that most of the higher institutions that offer industrial technology education and training do not have equipped learning workshop, do not expose their learner to the dynamic use of tools and to environment condition of the learner's workshop which constitute the best practices in industrial technology education and training are not encouraging. This, therefore hamper industrial technology education and training to provide its recipients with technological work skills that demand creativity, problem solving ability, higher thinking, skills, transferable and adaptable skills for self-employment to reduce the rate of searching for government paid jobs. It is based on this challenges that this study was conducted to determine the influence of workshop equipment, dynamic use of tools and environmental condition of the learner's workshop on students and institution industrial partnership for students' skills acquisition in industrial technology education and training in an era of economic uncertainties in Nigeria.

Purpose of the study

The general purpose of the study is to determine the influence of best practices in industrial technology education on students' skills acquisition in an era of economic

uncertainties in Nigeria, specifically the study is to:

- i. Assess the current workshop equipment available and the expected workshop equipment for students' skill acquisition in an era of economic uncertainties in Nigeria.
- ii. Investigate current physical environmental condition of workshop and the expected environmental condition of workshop for students' skills acquisition in an era of economic uncertainties in Nigeria.
- iii. Examine the current student's exposure to the use of tools and the unexpected student's exposure to the dynamic and effective use of tools for students' skill acquisition in an era of economic uncertainties in Nigeria.
- iv. Determine the challenges militating against the effective institution industrial partnership for students' skills acquisition in an era of economic uncertainties in Nigeria.

Hypothesis

The following null hypothesis were formulated for the study:

- i. There is no significant different between the current workshop equipment available and the expected workshop equipment for students' skill acquisition in an era of economic uncertainties in Nigeria.
- ii. There is no significant different between the current physical environmental condition of workshop and the expected environmental condition of workshop for students' skills acquisition in an era of economic uncertainties in Nigeria.
- iii. There is no significant between the current students' exposure to the use of tools and the expected students' skills acquisition in an era of economic uncertainties in Nigeria.

- iv. There is no significant relationship between effective institutional industrial partnership for student skills acquisition in an era of economic uncertainties in Nigeria.

Methodology

The descriptive research survey was used for the study. The population for the mass 110 students from the Department Industrial Technology Education, UNIUYO, Department of Vocational and Technology UNICROSS. The population was considered manageable and therefore used as the sample size for the study. This was in line with the assertion of Anikweze (1995) and Alamu and Olukosi (2008) whose asserted that if the population number small and manageable, it becomes synonymous with the sample. Thus, neither the sample size nor the sampling technique has required from the population. Adopted twenty-four items questionnaire was used to gather responses from the respondents.

Section A, dealt with the demographic data of the respondents, while section B, consisted of questionnaire items on equipment, environmental condition of the workshop, students' current to use of tools and institution relationship with industry.

On the rating of the instrument, the researcher used a 4- point rating scale with 4 points for Strongly Agree, (SA), 3 points, for Agree (A), 2 points for Disagree (D) 1 point for Strongly Disagree (SD). The reliability of the instrument was ensured through the split half reliability method and by the researcher and 108 copies of the questionnaire were duly completed and retrieved. The hypotheses were tested using t-test and Pearson product moment correlation coefficient at .05-degree significance.

Hypothesis i: There is no significant difference between the current workshop equipment available and the expected workshop equipment for students' skills acquisition in an era of economic uncertainties in Nigeria.

Table I: A T-test analysis of Equipment available and expected in schools' workshop.

Groups	Mean	SD	t-cal	t-crit
Equipment available in workshop	12.27	2.55	3.01	0.85
Equipment expected in workshop	17.16	3.51		

Table 1 shows the t-test analysis on equipment available and equipment expected in the workshop for teaching learning of industrial technology education and training. The result shown that the equipment available in the workshop had a mean of 12.27, the standard deviation of 2.55 while the expected equipment in the workshop had a mean of 17.16 with standard deviation of 3.51. The t-cal stood at 3.01 while t-crit stood at 0.85.

With this the null hypothesis is rejected. This shows that there is significant different between equipment available and equipment expected for the teaching and learning industrial technology education and training in tertiary institutions in an era of economic uncertainties in Nigeria.

Hypothesis ii: The result of the analysis is shown in table 2

Table 2: A t-test Analysis on current Physical Environmental Condition and the Expected Physical Environmental Condition of Students' Workshop

Groups	Mean	SD	t-cal	t-crit
Current Environment Conditions of Workshop	25.30	8.20	5.06	0.85
Expected Environmental Conditions of Workshop	45.10	11.40		

Table 2 shows the t-test analysis on current physical environmental condition of workshop and expected physical environmental of student's workshop for teaching/learning of industrial technology education and training in tertiary institutions. The result shown that the mean for current environmental condition of workshop stood at 25.30, standard deviation stood at 8.20 while the expected environmental condition stood at 45.10 standard deviation at 11.40. the t-cal

stood at 5.06 and t-crit stood at 0.85. with this the null hypothesis ejected which shows that there is significant difference between current physical environmental condition of students' and the expected physical experimental condition of students' workshop for teaching and learning of industrial technology education and training.

Hypothesis iii: The result of the analysis is shown in table 3

Table 3: t- test Analysis on current Students' Exposure to use of tools and expected exposure of students to dynamics use of tools in industrial technology education and training.

Groups	Mean	SD	t-cal	t-crit
Current students' Exposure to tools	18.44	3.31	5.67	0.86
Expected Students Exposure to tools	20.68	3.76		

Table 3 shows the t-test analysis on current students' exposure to tools with a mean of

18.44 with standard deviation of 3.31, while the expected students' exposure to tools at

20.68 with the standard deviation of 3.76. the t-cal stood at 5.67, with t-crit of 0.86. This shown that, there is significant difference between current exposure of students' to tools and the expected students' exposure to tools

in the workshop for teaching and learning industrial technology education and training.

Hypothesis iv: The result of the analysis is shown in table 4

Table 4: Pearson product moment correlation coefficient analysis on relationship between institution and industries in industrial technology education and training.

Variables	EX EY	EX2 EY2	EXY	r-cal	r-crit
Institutional Relationship	2170.368	1071.212	-83.866	-0.012	.00196
Industrial Relationship	1795.50	2418.632			

Table 4 shows that the calculated r-value (-0.012) was less that critical r-value (.00196) with the result, the null hypothesis was not rejected, which means that there is no significant relationship between institutions and industries for teaching and learning industrial technology education and training.

Discussion of Findings

Finding, one of the study shows that there is significance difference between equipment available and equipment expected for teaching and learning industrial technology education and training in tertiary institutions in an era of economic uncertainties in Nigeria.

. This finding is in ascertain with Adebile (2014) whose study posits that the equipment and instruments in some of the institutions where industrial technology education and training are offered needed to be upgraded since technology is ever-advancing. The argument of Adebile (2014) is so plausible because the increase of advanced technology in the world of work today, calls for standardization of industrial technology education and training students to acquire the needed skills and competence expected to fit into the dynamic world of economic uncertainties.

The second finding of the study shows that there is significant difference between current physical environmental condition and

the expected physical environmental condition of students' workshop for teaching and learning industrial technology education and training.

This finding agrees with Oviawe and Uddin (2017), whose studies shows that for industrial technology education and training students to perform maximally, the physical or learning environmental condition for students' workshop for teaching and learning should be upgraded in the areas of adequate lightening, safety and friendly.

Findings three of the study revealed that there is significant difference between current exposure of students to the use of tools and expected exposure of the students to dynamic and effective use of tools in the workshop for teaching and learning industrial technology education and training.

Modi (2018) supports the finding of this study that it is expedient for the industrial technology education and training students to be sufficiently exposed to the dynamic and effective of workshop tools and equipment. This will provide the latest skills, knowledge and competence for the students.

Finally, the fourth finding of the study indicates there is no relationship between institutional and industrial effective partnership for teaching and learning industrial technology education and training students, the finding is in line with the assertion of Osinem and Nwoji (2010) that a

lot of challenges tend to show down the partnership between industries and institutions. The finding is also in line with the assertion of Maugida (2014) that non-involvement of the industries (private sectors) in the development and endorsement of national quality standard in many nations of the world, mismatch between the labour market and industrial technology education and training. Programme; and training needs or expectation are not always identified and prioritized according to industry skills and work for development.

Conclusion

The finding of the study conducted that the skills acquired by industrial technology education and training graduates presently would soon become obsolete with the industrial technology education and training skills expected for self-reliance and in the labour market, and if adequate steps are not taken by the institutions management to equip the students' workshops with moderns equipment, the expected environment for teaching and learning and the partner with industries, it would amount to producing industrial technology education and training graduates that may be unemployed, and this will increase more, the rate of unemployment, that may lead to more social vice in Nigeria.

Recommendation

Based on the findings of the study, the following recommendations were include:

- 1 The head of institution that are offering industrial technology education in Nigeria tertiary institutions, should procure adequate modern equipment and instruments in the workshop for students use.
- 2 It is necessary for the heads of departments to encourage colleagues at different academic platform (conference, workshop training) to as much as possible to update their knowledge, skills and competence in the use of these modern workshops equipment and instruments so that they would be able to impact the skills and

competence into their students adequately.

- 3 Industrial technology education and training students' in Nigeria tertiary institutions should be exposed to the use of dynamic and effective tools that would enable them to contribution meaningfully in the world of work.
- 4 Tertiary institutions in Nigeria offering industrial technology education should involve the 21st century workplace in the planning and review of her curriculum and infrastructural and training partnership.

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