

## Entrepreneurial Skills through Science and Technology Education and the Emerging Challenges in the Attainment of Millennium Development Goals

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### Abstract

Entrepreneurial skills development through science and technology education is an essential tool for job creation. The current technical school curriculum is lacking in entrepreneurship training in terms of contents and activities for both students and teachers. This results to production of technical school graduates that cannot compete favorably in the world of work as regards being self-reliant and self-employed. The paper was a descriptive survey which assessed science and technology teacher's competencies and availability of material resources for developing entrepreneurial skills. The study was carried out in Niger State. The sample consists of 6 technical schools with their principals, 72 science and technology teacher and 108 students. The instrument used was questionnaire. The data were analyzed using mean statistics for the research questions. The hypotheses were tested at 0.05 level of significance using the analysis of variance. The findings revealed lack of entrepreneurial skills competencies on the part of science and technology teachers and lack of material resources for developing the needed skills. The recommendations include among others that science and technology teachers should be empowered to possess entrepreneurial skill for effective attainment of millennium development goals.

### Introduction

Skills and knowledge are power house of economic growth and social development. By investing in human resource enterprises, individuals are able to sustain themselves, improve productivity of world economics leading to better standard of living. Bata and Biu (2007) Oharis (2008) foresaw the necessity for entrepreneurial and technology teacher educators to engage students in activities that develop intellectual skills and understanding to equip students with knowledge about the ability to nurture communication, interpersonal and reasoning skills, and also to ensure that emerging teachers are able to integrate academic and entrepreneurial curricula. This will prepare the students with options for post secondary education. This will as well work to offer a broad base of knowledge and skills and pedagogy including ideas about constructivism, curriculum development and instruction, science and technology preparation, the interaction of academic and entrepreneurial contents. (Patrick 2009).

Entrepreneurship is the interest and ability to start and operate a business venture. It is the art and techniques of owning, operating and managing a business effectively and profitably. Anaekwe and Ozoigbo (2002) stated that Entrepreneurship is concerned with business initiative and management. It is the ability to function intelligently and actively in one's own business affairs, hence entrepreneurship in science and technology education would;

- ❖ equips individual with necessary skills and knowledge for self-reliance
- ❖ Reduces the problems of unemployment as more people that to be employed by entrepreneurs.
- ❖ enhances technology and economic development, as more entrepreneurs contribute to the development through job creation in production, distribution and services.
- ❖ enables individual appreciate the effect of entrepreneurs on the national economic development.
- ❖ enhances the alleviation of poverty or the reduction of poverty in the society.

According to Omatseye (2000), entrepreneur in science and technology education is a need primarily dictated by political, social and economic exigencies of contemporary societies. Olibie and Obidike (2008) stated that science and technology is a tool that has the single purpose of a means in achieving an end to unemployment. It is noted that the massive

unemployment has made entrepreneurship the only key to the survival of graduates of science and technology education in the present millennium.

With entrepreneurship in science and technology education, a graduate with a very low level of commencement can establish a business centre, Auto-mechanic shop, carpentry and joinery workshop, a cabinet making workshop, poultry farm, eatery or a fast food shop etc. Hence entrepreneurial development in science and technology education viewed as a vehicle for national development that enables the nation to meet with rest of the world in the context of globalization. Thus Nigeria cannot afford to be left behind on the track of the right type of entrepreneurship which can put her on the right pedestal for the attainment of Millennium Development Goals (MDGs) in Nigeria

### Research Questions

- i. To what extent does the science and technology teacher in the technical schools possess the competencies for the development of entrepreneurial skills in the student?
- ii. What is the level of availability of technological and infrastructural facilities for developing entrepreneurial skills in science and technology education?
- iii. What are the strategies that would be adopted by science and technology teachers in developing the entrepreneurial skills for effective teaching and learning of science and technology education?

### Null Hypothesis

The following null hypothesis guided the study

- There is no statistical significance difference in the mean rating of principals, science and technology teachers and students on the competencies possessed by science and technology teachers in developing entrepreneurial skills.
- The mean ratings of principals, science and technology teachers and students on the availability of technological and infrastructural facilities for the development of entrepreneurial skills will not differ significantly.

### Methodology

The design adopted for the study was descriptive survey. According to Anaskwe and Ozoigbo (2000), this involved collection of data, often using questionnaire, for the purpose of describing and interpreting existing conditions or qualities about a given population.

### Population

The target population consisted of all the principals (6) science and technology teachers (72) and 108 TC II students were selected in the three (3) educational zones. Niger State has 6 technical schools sampling techniques.

All the 6 technical schools were used for this study. Also 4 science teachers and 8 technology teachers and 18 students were selected from each of the 6 technical schools giving a total of 24 science teachers and 48 selected were those with teaching qualification while the student selection was based on school register. 18 TC II students were selected from each school, MI the 6 technical schools with their principals, 72 science and technology teachers and 108 students formed the sample for the study.

### Instrument

The instrument used was a questionnaire which was titled. Entrepreneurial skills through science and technology education and, the emerging challenging in the attainment of millennium development goals (ESTSTE) the ESTSTE was validated by 2 science and technology experts from Federal University of Technology, Minna.



### Method of Data Analysis

The research questions were answered using means statistics. The hypothesis were tested at 0.05 level of significance using the analysis of variance (ANOVA). The acceptable level of mean score was 2.50 and above, while 2.49 and below was not accepted.

This technique was deemed adequate because the hypothesis involved more than two group comparison of mean scores.

### Result

The results of this study were presented in line with the research questions and the hypothesis in table 1, 2, 3, 4 and 5.

**Table 1:** Mean rating of principals, teachers and students on competencies possessed by science and technology teachers.

S/No	Items on the competencies possessed by science and technology teachers	Principals mean	Science and Technology Teachers Means	Students Mean	Decision
	The science and technology teachers in your school possess the following entrepreneurial skills				
1	Mental Alertness	2.53	2.61	2.81	A
2	Love for hand-on-activities, i.e. practical experiment	3.60	3.81	3.70	A
3	Interest in problem solving	2.51	2.50	2.11	D
4	Income generation and self empowerment creative thinking skills which enable them to:	3.81	3.14	3.66	A
5	Generate ideas, produce goods and services	1.26	2.33	1.09	D
6	Reward creative ideas and products and take sensible risks	2.21	2.26	2.23	D
7	Life coping skills like raising of crops	1.01	1.86	1.45	D
8	Food production and preservation	2.20	2.48	1.11	D
9	Self reliance	2.02	1.64	1.42	D
10	Jon competence by showing the above skills	1.08	2.23	1.21	D

Data in table 1 revealed that the respondents, principals, science and technology teachers, and students agreed to item in number 1, 2 and 4 but disagreed to items in number 3 and those in 5-10. This indicated that science and technology teachers are not competent in most of the entrepreneurial skills.

**Table 2:** Mean ratings of principal, science and technology teachers, and students on availability of technological and infrastructural facilities.

S/No	Items on the availability of technological and infrastructural facilities	Principals mean	Science and Technology Teachers Means	Students Mean	Decision
	Your school has the following				
1	Equipped science and technology laboratory	2.31	1.00	1.31	NAV

2	Essential amenities like water	1.11	0.61		NAV
3	Constant electricity	2.51	2.64	2.56	NAV
4	Classroom blocks for students at UNESCO ratio of 30 students per class	1.22	1.46	1.77	NAV
5	Furnished staff offices	2.31	1.09	2.01	NAV
6	Well equipped library	1.20	2.14	2.00	NAV
7	Computers with internet connectivity	0.00	0.00	0.00	NAV
8	Automatic generators	0.00	0.00	0.00	NAV
9	Well equipped and protected computer laboratory	1.61	1.03	1.16	NAV
10	Well equipped workshop for practical works	2.00	1.33	1.41	NAV
11	Functional farm land	2.01	1.61	1.13	NAV
12	Fridges for food preservation	0.00	0.00	0.00	NAV

Data in table 2 revealed vividly that all the listed technological and infrastructural facilities were not available in technical schools for developing entrepreneurial skills. This was revealed by the fact that the entire item scored below the acceptable mean of 2.50 and above.

**Table 3:** Mean ratings on the strategies that would be adopted for empowering science and technology teachers in developing entrepreneurial skills.

S/No	Items on strategies for empowering science and technology teachers	Principals Mean	Science and Technology Teachers Means	Students Mean	Decision
	Staff development which can take the following forms:				
1	In-serving training	4.01	3.86	3.00	Agree
2	Sponsoring teachers for national conferences	2.98	3.33	3.41	Agree
3	International conferences	2.94	3.00	3.46	Agree
4	Workshop/seminars for entrepreneurial skills	2.84	3.01	3.26	Agree
5	Oversea training on developing entrepreneurial skills	3.04	3.16	3.00	Agree
6	Payment of allowances	3.94	3.45	3.82	Agree
7	Provision of adequate technological and infrastructural facilities	2.86	2.77	3.31	Agree
8	Well equipped offices	4.00	4.31	3.64	Agree

Data in table 3 showed that the respondents agreed that all the listed items would be adopted for empowering science and technology teachers in developing entrepreneurial skills for teaching and learning. This was revealed by the fact that all the items scored above the acceptable mean of 2.50 and above.

**Table 4:** ANOVA table on the mean rating of principal, science and technology teachers and students on the availability of material resources.

Source of Var.	DF	SS	MS	F-Cal	F-tab
Treatment	2	0.005	0.003	0.004	3.31
Error 35	24.44	0.66			
Total 37	24.31				

Decision: Not significant at  $P < 0.05$



**Table 5:** ANOVA table on the mean rating of principals, science and technology teachers and students in developing entrepreneurial skills.

Source of Var.	DF	SS	MS	F-Cal	F-tab
Treatment	3	3.41	1.21	2.98	3.47
Error 27	12.33	0.41			
Total 29	14.11				

Decision: Not significant at  $P < 0.05$

### Discussion/Conclusion

The results of this study have indicated that science and technology teachers lacked competencies in developing entrepreneurial skills as shown in table 1. The ANOVA test of hypothesis 1, showed no significant differences in the ratings of principals, science and technology teachers and students. This complemented the view of Asogwa (2000) Rychen and Salganik (2003) who noted that mastering basic skills and concept in ones area of specialization are becoming part of core of STM education. This means that science and technology teachers should first be developed in entrepreneurial skills so as to effectively develop same in the students.

The study also showed serious lack of material resources including technological equipments. The ANOVA test in table 2, also confirmed that the view of the respondents were unanimous on the lack of technological and infrastructural facilities. The finding is in agreement with Olangungi (2003) Umeh (2006) and Yusuf (2010) who found non availability and low-level utilization of ICT facilities in Nigerian schools. There has to be adequate provision of resources for successful development of entrepreneurial skills for both teachers and students.

The study also reveals that certain strategies would be adopted for empowering science and technology teachers in developing entrepreneurial skills as shown by the ratings of the respondents. This study supported that of Okeke (2007) who reported that teachers need help in several areas of their teaching task and recommended capacity building strategies as a way of providing the teachers with the needed skills, as well as to enable the students to find job satisfaction in the labour force of the complex and dynamic economy.

The implementation of the above findings is the need for the implementers (teachers) of educational policies to be competent in the task expected of them. Teachers are at the hub of any educational system. For upon their number, their quality, their devotion an their effectiveness depend on the success of the system and no education system can be stronger than its teachers.

In conclusion, one need to acknowledge that science and technology plays significant role in study of entrepreneurial. Science and technology teachers therefore need to be groomed on the requisite skills need for effective development of entrepreneurial skills through science and technology education. Teachers need to develop these skills in technical schools for effective study of science and technology. Emphasis on these skill would go along way in boosting the students' interest, enthusiasm and participation in the study of science and technology. Subsequently, learners who are productive in the society, will be produced and the gap between the content taught in school and the application in the work place will be bridged.

### Recommendations

- Teachers should emphasize functionalism in their instructions rather than certificate
- Science and technology teachers should be granted in-service training in the skills of entrepreneurship
- Science and technology teacher should always be sponsored for national and international conferences for entrepreneurial skills.

- All stakeholders should join hands together in providing adequate resources for successful development of entrepreneurial skills.

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