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The Impact of the Senior Secondary School New Physics Curriculum on Entrepreneurship Skill Acquisition among Nigeria Physics Students

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ABSTRACT

The study investigated the impact of secondary school new physics curriculum on entrepreneurship skill acquisition among Nigeria physics students. Two research questions and one hypothesis were used. A sample of 20 teachers and 300 students from senior secondary schools in Awka Education Zone were used in the study. Data were collected using two questionnaires and analyzed using mean and t-test. Results show that teachers teach the entrepreneurial content areas of the new curriculum effectively and this has significant impact on entrepreneurship skill acquisition among students. Based on the findings, it was concluded that the new physics curriculum has significant impact on entrepreneurship skill acquisition among physics students.

Keywords: Impact, curriculum, entrepreneurship, skill, acquisition.

INTRODUCTION

The study of physics at all levels is crucial for any nation that wants to maintain its lead among others. The technological potentials of any nation could be more accurately gauged by the quality of its physics education [1]. According to [2], physics is defined as the study of matter in relation to energy. It is a unique subject which promotes the acquisition of specialized science skills and knowledge which explains the natural phenomena of life in the society. Physics has contributed significantly to the development of modern technologies which have immensely simplified human life. The widespread utility of physics in scientific and technological application has made physics education a key predictor of scientific competitiveness [3]. Hence, in order to achieve the breakthrough in science and technology, a sound knowledge of physics becomes paramount for the nation. This implies teaching the students in such a manner that can instill the right concepts of

the facts and principles of physics in them, thus leading to accurate interpretation and application of such facts and principles. Hence, guided discovery method of teaching has been recommended by [4] for teaching physics in secondary schools in an effort to achieve this objective.

Curriculum, on the other hand, is the totality of student experiences that occur in the educational process [5]. It often refers to a planned sequence of instruction or the knowledge and skills students are expected to learn which include: the learning standards or learning objectives they are expected to meet. In the current senior secondary school physics curriculum, one of the general objectives is to stimulate and enhance creativity amongst secondary school physics students [4], through the process of entrepreneurship education.

Entrepreneurship education, according to [6] is the development of the attitudes and skills of people in such away as to help them fully realize their potentials. In order to stimulate creativity and develop process skills in students through entrepreneurship education, the curriculum is student-activity oriented with emphasis on experimentation, questioning, discussion and problem-solving. The introduction of physics in technology in the new curriculum provides an opportunity for the construction and operation of workable devices as well as acquaintance with some products of modern technology [4]. In the old physics curriculum, there was complete exclusion of technology despite the fact that its associated knowledge and skills are very vital for self reliance and personal sustenance. Therefore, in this new curriculum, technology has been deliberately introduced so as to stimulate the students' interest in technological fields and provide the foundation for growth of technical and vocational skills in them.

In this, regard, one of the salient futures of this curriculum is "vocationalization" of physics education for entrepreneurship skill development. According to [7], the concept of "vocationalization" refers to the emphasis placed on the utilitarian aspects of the subject taught in schools and acquisition of knowledge, values and skills from school learning. On the other hand, entrepreneurship skills are skills related to identifying business opportunities and receiving a sustainable income from these opportunities [8]. Thus, within the new physics curriculum some of the content materials that are related to vocational education for entrepreneurship development among physics students include:

1. Construction of simple tester to defect faults in electrical circuits.
2. Construction of solar flat plate collector

3. Construction of simple pens cope, film projector, simple camera, telescope, etc.
4. Construction of local musical instruments used in their locality.
5. Construction of a battery of at least three cells for lighting bulbs.
6. Preparation of electrolyte for electroplating a surface electrode.

STATEMENT OF THE PROBLEM

Today, in Nigeria, government, educators and individuals are worried about the rate of increase in mass unemployment amongst the school leavers, ranging from those that graduated from higher institutions of learning down to secondary school leavers. More also, many physics students that successfully completed their secondary education could not further in tertiary education because of the financial status of their parents. Hence, it becomes imperative for these young school leavers to find alternative means of making income by engaging themselves in entrepreneurship activities that could yield them some financial benefits to sustain themselves and even further their education instead of depending solely on government and parents. Such entrepreneurship activities can be generated from entrepreneurship skills acquired by the physics students, based on their curriculum, while in secondary school.

Hence, the problem of this study is to investigate the impact of the senior secondary school new physics curriculum on entrepreneurship skill acquisition amongst secondary school physics students.

PURPOSE OF THE STUDY

This study intends to:

1. Identify some of the content areas in the senior secondary school new physics curriculum that are related to entrepreneurship skill acquisition among physics students in secondary schools.
2. Finding out if physics teachers are effective in teaching the content areas of new physics curriculum that enhance entrepreneurship skill acquisition among physics students.
3. Investigate the impact of the physics teachers' effectiveness in teaching the entrepreneurial contents of the curriculum on entrepreneurship skill acquisition among the physics students.

RESEARCH QUESTIONS

This study sought answers to these research questions:

1. Do physics teachers teach effectively those content areas of the secondary school new physics curriculum that enhance entrepreneurship skills acquisition among secondary school physics students?
2. To what extent do secondary school physics students acquire entrepreneurship skills based on the contents of the new physics curriculum?

HYPOTHESIS

The study was guided by one null hypothesis which was tested at 0.05 significance level.

Ho: There is no significant impact of physics teachers' effectiveness in teaching entrepreneurial content area of the new physics curriculum on entrepreneurship skill acquisition among secondary school physics students.

METHODOLOGY

The study adopted a descriptive survey design. All the physics teachers and students in the thirty four (34) senior secondary schools in Awka Education zone of Anambra State, Nigeria made up the population of the study. Stratified random sampling was used to select fifteen (15) secondary schools based on the two (2) local government areas that make up the zone. All the twenty (20) physics teachers in the sample schools and twenty (20) students selected from senior secondary three (SS3) physics students in each of the sample schools form the sample for the study. A total of 300 SS3 physics students were used.

Two structured questionnaires twenty (20) items each for teachers and students built on 4-point likert scale were used for data collection. The instruments were pilot tested for reliability using split-half technique and values of 0.89 and 0.87 (for teachers and students) were obtained for Pearson's Product Moment co-efficient of reliability (r).

Arithmetic mean (x) with decision point of 2.50 was employed in answering the research questions. The rating scale is as follows: Strongly Agree (SA) = 4 points; Agree (A) = 3 points; Disagree (D) = 2point; Strongly Disagree (SD) = 1point.

RESULTS

Table 1: Mean responses of the teachers on their effectiveness in teaching the entrepreneurial content areas of the new physics curriculum.

S/N	Item	Mean x	SD
1	Provide materials for constructing an electrical continuity tester.	3.08	0.046
2	Use the constructed tester to detect the point of discontinuity in a faulty electric circuit.	3.01	0.047
3	Provide the materials for constructing a solar flat plate collector.	3.99	0.043
4	Help students to construct the solar collector.	3.24	0.044
5	Use the constructed solar collector to heat water.	1.08	0.048
6	Demonstrate how to construct a resistance thermometer.	3.34	0.044
7	Demonstrate how to construct a thermocouple.	3.16	0.045
8	Lead students to construct any of these devices: simple periscope, box camera, compound microscope, telescope, film projector.	1.71	0.049
9	Arrange students' visit to a company that markets the devices in item 8.	3.74	0.043
10	Invite speakers to demonstrate the use of these devices.	3.28	0.047
11	Show how to construct the musical instrument s used in the locality.	3.22	0.045
12	Provide suitable electrolyte for use in the construction of a battery of at least three cells.	3.29	0.044
13	Assist students to construct the battery.	3.00	0.045

14	Show film/chart of various parts of galvanometer, electric motor and generators.	3.21	0.044
15	Arrange a visit to an electrician workshop for display of the various parts of these devices under repairs.	3.92	0.041
16	Lead discussion on the construction of these devices.	3.84	0.043
17	Show film/chart of a transformer and its parts.	3.00	0.045
18	Invite an expert to give a talk on electrical transmission from energy generating plant to the consumers in the street.	1.59	0.047
19	Provide materials for the construction of simple laboratory equipments like metre rule, ray box, pulley, circuit boards, current rectifiers , etc.	3.74	0.044
20	Lead discussion on the construction of these equipments.	3.09	0.046
	Grand	3.08	0.045

Data analysis in table 1 shows that physics teachers are generally effective in teaching the entrepreneurial content areas of the new physics curriculum. The grand mean is 3.08 which is above the decision point of 2.50. They are ineffective in only items, 5, 8 and 18 (3items) which have mean scores of 1.08, 1.71 and 1.59.

Table 2: Mean responses of physics students on the extent they acquire entrepreneurship skill based on the content of the new physics curriculum.

S/N	Item	Mean x	SD
1	Construct a simple tester for detecting faults in electric circuit.	3.72	0.111
2	Construct a solar flat plate collector for collecting solar energy.	3.44	0.114

3	Construct a resistance thermometer	3.15	0.110
4	Construct a thermocouple	3.21	0.113
5	Construct a telescope	1.21	0.116
6	Construct a box camera	3.22	0.112
7	Construct a compound microscope	3.50	0.109
8	Construct a simple periscope	3.21	0.111
9	Construct a film projector	3.25	0.112
10	Construct musical instruments used in their locality.	3.55	0.110
11	Construct a model transmission system using a transformer	1.00	0.111
12	Construct a galvanometer.	3.03	0.117
13	Construct a electric motor	3.69	0.114
14	Construct a d.c generator	3.09	0.109
15	Construct an a.c generator.	3.42	0.112
16	Construct a battery of at least three cells	3.62	0.111
17	Construct simple laboratory equipments like: metre rule, knife edge, lens holder, screen, drawing board, t-square, inclined plane, pulley.	3.84	0.108
18	Construct circuit boards (parallel and series arrangements)	3.10	0.113
19	Construct circuit rectifier.	3.24	0.111
20	Construct a rechargeable lamp.	1.04	0.116
	Grand	3.03	0.112

Table 2 above shows that the new physics curriculum enhances students' acquisition of entrepreneurship skill. The grand mean score is 3.03. The students below the decision point of 2.50 in only items 5, 11 and 20 (3 items) with means of 1.21, 1.00 and 1.04

indicating that they have some difficulties in acquiring entrepreneurship skill based on those content areas of the new physics curriculum.

Table 3: T-test of the impact of physics teachers' effectiveness in teaching entrepreneurial content areas of the new physics curriculum on entrepreneurship skill acquisition among physics students.

Variables	No of subjects	Mean score	SD	DF	t-cal	t-tab	Decision
Teachers	20	3.080	0.045				Reject
Students				318	4.17	1.65	Ho
	300	3.030	0.112				

Table 3 revealed that the t-calculated is 4.17 which is higher than the table t-value of 1.65 at 0.05 level of significance with df=318. Therefore, the null hypothesis was rejected. Hence, there is significant impact of physics teachers' effectiveness in teaching entrepreneurial content areas of the new physics curriculum on entrepreneurship skill acquisition among secondary school physics students.

DISCUSSION

The finding in table 1 indicated that physics teachers are effective (grand mean = 3.08) in teaching the content areas of the new physics curriculum that enhance entrepreneurship skill acquisition among secondary school physics students. From table 2, the physics students responded that the new physics curriculum enhances their acquisition of entrepreneurship skill (grand mean = 3.03). Hence [4] commented that the new physics curriculum helps students to acquire essential scientific skills and attitudes as a preparation for technological application of physics and enhances creativity in students.

Morealso, the findings in table 3 revealed that physics teachers' effectiveness in teaching entrepreneurial content areas of the new physics curriculum has significant impact on entrepreneurship skill acquisition among secondary school physics students, Thus, [9] asserted that functional physics education in school helps learners to develop entrepreneurial skill in area of iron bending, repairs of electrical/electronic gadgets like radio and television etc, through creative work.

CONCLUSION

The physics teachers are very effective in teaching the students the entrepreneurial content areas of the new physics curriculum. Hence, the senior secondary school new physics curriculum has significant impact on physics students' entrepreneurship skill acquisition. Thus, with functional physics education that provides opportunity for entrepreneurship skills acquisition among secondary school physics students, they can be self-employed after leaving school. This will drastically help to reduce the number of unemployed youths and school leavers hovering the streets in search of job.

RECOMMENDATIONS

Based on the findings of the study, the following recommendations were made.

1. There should be more vibrant and functional physics education that will be geared towards self-reliance.
2. Efforts should be intensified by education policy makers of the delivery of the practical contents of entrepreneurship skills by physics teachers.
3. Government should regularly organize workshops/seminars for physics teachers in order to acquaint them with developments in science and technology.
4. Entrepreneurial education should be introduced in all the sectors of Nigeria education system. This will go a long way in providing job opportunities for the young school leavers.

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