



Impact of Entrepreneurship Education and Recycling of Waste Papers on Entrepreneurship Skills Development of Science Education Students

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Abstract

This study investigated the impact of entrepreneurship education and recycling of waste papers on entrepreneurship skills development among science education students in Enugu State University of Science and Technology. Two research questions and one hypothesis guided the study. Two hundred and forty-five (245) students randomly selected from the population of five hundred and twenty-four (524) science education students, comprising of one hundred and twenty-five (125) females and one hundred and twenty (120) males were used for the study. Data were collected using a structured questionnaire. The relationship between the study groups previously acquired skills before exposure and acquisition of entrepreneurship skills after exposure of male and female students were analyzed using 2x2 contingency chi-square test. $P < 0.05$ was considered as significant. Results showed that entrepreneurship education and recycling of waste paper for the production of pulps promoted acquisition of entrepreneurship skills. This study recommended among others that entrepreneurship education to undergraduates will help in reducing unemployment and empowering the youths to be job creators.

Keywords: Recycling, Waste papers, Pulps Entrepreneurship Education.

Introduction

Entrepreneurship education (EE) has been defined as “a collection of formalized teachings that informs, trains, and educates anyone interested in participating in socio-economic development through a project to promote entrepreneurship awareness, business creation, or small business development” United Nations Educational, Scientific and Cultural Organization / Vocational Education (UNESCO/ UNEVOC, 2006 p.3). It involves learning the skills to start a business, support to start a business while at university, and the skills and mindset necessary for employers. Entrepreneurship education is important because it is recognized as a potentially effective means of promoting the transformation of ordinary people into entrepreneurs who are aware of future opportunities to make a career by creating profitable mini-companies. Moreover, EE at the basic level becomes relevant for developing reasoning and problem-solving skills, transferring knowledge and establishing the basis of entrepreneurship during the stage of life in which good practices are ingrained (Gibb, 2006; Askun & Yildirim, 2011). The intention of EE is to develop an entrepreneurship spirit gradually, beginning during a child’s education and then to strengthen this spirit at higher educational levels; effectively providing that such a spirit has been achieved when the individual enters the labour market (Nwalado, 2012). Entrepreneurship education

is grounded on the cognitive approach to entrepreneurship and the entrepreneurial method that sustain understanding of what the knowledge structures of entrepreneurs, how they act and decide applies to the design of strategies for developing the entrepreneurial spirit, skills and abilities of any individual who wants to learn how to be an entrepreneur (Sanchez, Carballo & Gutierrez, 2011; Heinonnen & Poikkijoki, 2006; Sarasvathy & Venkataramon, 2011).

Entrepreneurial skills are skills that will enable an individual seek and run an enterprise successfully. The skills are: identification of investment opportunities, choice of investment opportunities, the decision of the form of business enterprise, factor combination and management of fund, business directorship, risk-bearing, innovation (Omiko, 2014). Gautam and Singh (2015) also opined that the ways to develop students’ abilities to be enterprising entrepreneurs are: getting them to be enterprising, assessing their enterprise, actively providing them with some training and development, developing/promoting students’ involvement in enterprise and embedding enterprise into the curriculum.

Paper, a consumer product is of immense benefit to society especially in the area of education, security, sanitation and communication, thus the commodity is produced and consumed worldwide (Ezeudu,



Agunwamba, Ezeaser & Madu, 2019). Waste paper materials have been so much ignored and destroyed due to a lack of knowledge of what they can be converted to. However, with the advancement of science and technology, it has been discovered that waste paper materials can be recycled into different modules and packaging materials which are important to effectively manage our abundant waste paper and paper products. These waste papers will not be abandoned rather jobs and income will be generated through the direct and indirect engagement of entrepreneurs to curb the rate of unemployment in Nigeria today, young entrepreneurs may embark on pulp production using waste paper materials.

Randy (2019) describes an entrepreneur as one who takes an idea and develops a new business around it. They manage the business and assume the risks for success. The entrepreneur initiates activity and organizes the resources to ensure that the venture produces benefits. He decides what should be done, how it can be done and how much of the goods and services will be produced. Pulp production using waste paper materials will give a base for such entrepreneurships.

In paper making, TonerBuzz (2019) noted that recycled paper accounts for about 33% of the raw materials while whole tree and other plants, wood chips and scraps from sawmill accounts for 66%. 44 million tons of papers were recycled in United States at a rate of 65.9% in 2017, 79% in United Kingdom and 71.5% in European Union (TonerBuzz, 2019).

Despite the huge forest reserves supporting the paper and pulp industry, Nigeria has no record of zero importation of paper and pulp (Feng, 2020). Deforestation and for pulp making. All the paper mills in Nigeria including Nigerian paper mill, Jebba, and Nigeria newsprint manufacturing company, Oku Iboku are closed down (Egbewole & Rotowa, 2017). The director-general of Raw Materials Research and Development Council (RMRDC) lamented that recent statistics show that the country loses over N800 billion annually to paper products importation (Olajide, 2019). Though Egbewole and Rotowa (2017) recommended putting measures of sustainable wood production, yet paper recycling which accounts for about 33% of the paper making raw materials should be explored.

Waste papers are increasingly becoming important following the rate at which paper mills are going into extinction while there is an increasing volume of paper consumption in academic communities ranging

from Primary, Secondary, universities, polytechnics and Colleges of Education. It was asserted that paper alone constitutes over 29 percent by weight and 50 percent by volume of total domestic refuse which can be recycled.

Paper recycling involves all the processes of reprocessing waste paper for reuse. It is the process of mixing used papers with water and chemicals to break it down. Uba, (2013) says “jumbo roll or jumbo reel is the major raw material for the production of toilet rolls or serviettes”.

Severally, waste paper materials have been so much ignored and destroyed due to lack of knowledge of what they can be converted to. But as technology advances and knowledge increases, there is therefore the need to innovate ways that facilitate not be overlooked again and abandoned, rather, jobs and income will be generated through direct and indirect engagement of entrepreneurs.

However, in Nigeria this is not a common practice probably due to lack of technology or poor advocacy and lack of knowledge of the benefits of paper recycling. The existing paper mills are not also pursuing this paper recycling project as an additional good source of raw materials for pulp making as well as an additional source of income if it can be recycled creating another economic window for operators. Recycling, it can be direct or indirect. Direct recycling refers to the use of recovered waste paper for the manufacture of paper and boards. In direct recycling, recovered waste paper after being cleaned, washed and re-pulped becomes secondary fibres ready for the paper or board making machine. Indirect recycling on the other hand refers to the recycling of waste paper into other forms of materials other than paper and board. For example, the incineration of waste paper for heat recovery, or the recycling of waste paper with other combustible components of refuse into waste derived fuel, or the conversion of the cellulose in the waste paper to a combustible gas by hydrolysis.

Waste papers are used in this context as soiled, damaged paper materials discarded because users no longer consider any further use for them. They are therefore generally of no economic value unless regarded as a potential source of secondary materials or energy. ‘Paper’ used in this context includes both paper and board. Paper on one hand is a matted or felted sheet, usually made of cellulose fibres, formed on a wire screen from water suspension (Britt, 2020); it is an aqueous deposit of any vegetable fibre in sheet



form (CPI, nd). Board has been defined as 'stiff and thick paper'. International specification requires paper above 250 gm to be classified as 'board'. Noble (2013) highlighted the process of pulp and paper making in a small scale as follows:

- Gather the raw materials especially the paper for recycling and carry out pre-cleaning activities to remove unwanted materials;
- Breakdown the raw materials into smaller particles and soak in water to soften
- Breakdown the chopped materials into individual fibres by grinding, forming a fine paste. Usually, this achieved by using grating machines or any other equipment that has the facility to breakdown particles into smaller pieces.
- Scoop into an existing mould the pulp paste and allow to drain and
- Dry to form a paper.

This study therefore aimed at recycling of waste papers for the production of pulps to enhance entrepreneurship in Science Education; Enugu State University of Science and Technology.

Statement of the problem

Unemployment among Nigeria youths has been on the increase and this has been attributed to lack of entrepreneurship skills development among our youths. There is need to explore the impact of entrepreneurship education and recycling of waste papers on the development of entrepreneurship skill among students.

Purpose of the study

The main purpose of the study is to investigate the impact of entrepreneurship education and recycling of waste papers on entrepreneurship skill development among Science Education Students in Enugu State University of Science and Technology.

Specifically, the study intended to;

1. Determine the exhibition of entrepreneurship skills among science education students before and after the training
2. Determine gender differences in the exhibition of entrepreneurship skills among science education students before and after the training

Research Questions

The following research question guided the study:

1. What are the differences in exhibition entrepreneurship skills among Science Education Students before and after the training?
2. Are there gender differences in the exhibition of entrepreneurship skills among science education students before and after the training?

Hypothesis

The following hypotheses guided the study. **Decision rule:** Accept hypothesis if $P < 0.05$

1. **H₁:** there is significant difference in the exhibition of entrepreneurship skills before and after the training of students
2. **H₂:** there is significant difference in the exhibition of entrepreneurship skills among science education students before and after the training

Methodology

This study was a cross-sectional study designed to promote entrepreneurship skills among Science Education students of Enugu State University of Science and Technology through entrepreneurship education and recycling of waste papers for the production of pulps. Two hundred and forty-five (245) students out of the total population of 524 students of Science Education Department 2020/2021; sample and sampling techniques: 125 females and 120 males were selected for the study using simple random sampling techniques. The instrument for data collection was a structured questionnaire designed to elicit information on demographics and previously acquired entrepreneurial skills status before the commencement of the training. The instrument was validated by three experts; two from department of Science Education and one from Measurement and Evaluation, all from Enugu State University of Science and Technology (ESUT). The reliability of the instrument was done using Cronbach alpha and the reliability coefficient obtained was 0.78

The students were given entrepreneurship education by experts, and were later grouped into ten for easy contact and for all to be closer to the demonstration table during practical demonstration. Previously prepared notes on step-by-step procedure on recycling of waste papers for the production of pulps were given to the participants. The duration of the

entire training was twelve months of which eight months were used for intensive training. Thereafter, the participants were given four months for continuous practice and exhibition of all the acquired skills. The performance of the students was recorded and statistically analyzed using chi-square test. P value <0.05 was considered as significant.

Results

Table 1: Exhibition of entrepreneurship skills before and after the training among the students

| Entrepreneurship Skills | Exhibition of Entrepreneurship Skills | | | P value |
|-------------------------|---------------------------------------|------|-------|---------|
| | B.T. | A.T. | Total | |
| Yes | 55 | 168 | 223 | *0.001 |
| No | 190 | 22 | 212 | |
| Total | 245 | 190 | 435 | |

* Significant, B.T (Before Training) & A.T (After Training)

Table 1 showed that there is a significant difference in the exhibition of entrepreneurship skills before and after the training of students (P < 0.05). Out of 245 students that participated in the study, 55 (22.4%) exhibited entrepreneurship skills before the training while 190 (77.6%) did not exhibit entrepreneurship skills before the training, then, after additional 168 students exhibited entrepreneurship skills after the training, a total of 223 (91.0%) students finally had entrepreneurship skills.

Table 2: Exhibition of entrepreneurship skills before and after the training according to gender

| Gender | Exhibition of Entrepreneurship Skills | | | P value |
|--------|---------------------------------------|------|-------|---------|
| | B. T. | A.T. | Total | |
| Male | 31 | 83 | 114 | *0.2 |
| Female | 24 | 85 | 109 | |
| Total | 55 | 168 | 223 | |

*Not significant

Table 2: showed that there is no significant difference in the gender exhibition of entrepreneurship skills before and after the training of students (P >0.05).

Discussion

The rising rate of unemployment among Nigerian youths has been major challenge in recent times and is undoubtedly attributable to lack of entrepreneurship skills. This study shows that about 190 (77.6%) of science education students do not

have entrepreneurship skills before the commencement of the study.

However, after intensive training on recycling of waste papers for the production of pulps, 223 (91.0%) of the students acquired entrepreneurship skills. There is a significant relationship between entrepreneurship skill acquisition and recycling of waste papers for the production of pulps among male and female students, (p <0.05). This shows that entrepreneurship education and recycling of waste papers for the production of pulps promoted acquisition of entrepreneurship skill among the male and female students. Other previous studies have shown that demonstration method of teaching has effect in academic achievement and retention of students, and that entrepreneurship education has the mandate to equip the youths with functional knowledge and skill to build up their character, attitude and vision (Okotubu, 2020; Daluba, 2013; Gautam& Singh, 2015). This finding is not surprising as students often demonstrate interest in practical aspect of entrepreneurial education and anything that has to do with income generation. The staggering difference among male and female students after exposure to demonstration of recycling of waste paper for production of pulps was a mark of excitement and willingness to participate which can be stressed further in subsequent study.

Conclusion

This study showed that entrepreneurship education and recycling of waste papers impacted on the entrepreneurship skills development among the science education students. This buttresses the need for entrepreneurship education in our universities as it will help in repositioning the economic development, job creation, wealth creation and global competitiveness of Nigerian youths and graduates.

Recommendation

This study recommends entrepreneurship education, exposure to skill acquisition through demonstration of recycling of waste paper for production of pulps to undergraduates, as this will help in reducing unemployment and empowering the youths to be job creators.

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Conflict of interest

The authors declare no conflict of interest

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