

MULTIPLE PROJECTS WORKING ANIMAL HUSBANDRY AND ACADEMIC PERFORMANCE OF SECONDARY SCHOOL STUDENTS FOR SUSTAINABLE NATIONAL DEVELOPMENT IN NIGERIA.

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ABSTRACT

The very many negative notions of the Nigerian education system together with many seemingly plausible suggestions offered by the academic community must have resulted in reforms in the education industry generally and in the curricula in particular. One of such reform is the “re-introduction” of entrepreneurial education in the curriculum. Trade Subjects are made compulsory at the secondary school level. Every graduating secondary school student must offer at least one trade subject: Animal Husbandry, Fishery, Garment Making, Data Processing, Tie and Dye, are but a few examples. Some scholars agree that the most important aim of introducing entrepreneurship education is to break the cycle of poverty that has ravaged the citizenry for decades. Since science as well as trade subjects are now offered in secondary schools, will effectively engaging students in projects enhance achievements and enrollment in a technology subject like Animal Husbandry? Quasi-experimental design was adopted to answer this question. Sample of 492 students were used. ANCOVA, t-statistics and chi square were used to test research hypotheses. Results show that students who carried out specific projects scored significantly higher mean values than those who did not, that involvement in more specific projects in the same school session enhanced students’ achievement than less specific projects. Increasing specific projects did not result in increased enrollments of students significantly among gender. Schools should involve students in experiential teaching and learning strategies like projects for sustainable national development.

KEYWORDS: Animal Husbandry, Projects, achievement, sustainable development.

INTRODUCTION

Presently, curriculum planners are using subject offerings to try and solve, not only today’s educational problems but to add such values that make national developments sustainable. National empowerments channeled through education are seen as sustainable. It is therefore not surprising that Nigeria’s National Economic Empowerment Development Strategy (NEEDS) was introduced to help chart the way forward in this direction. The National Planning Commission approaches this strategy through education (Abonyi&Okoli, 2009):“NEEDS recognizes education as a vital transformational tool and formidable instrument for socio-economic empowerment” (P21) the application of entrepreneurial education is a vital component of NEEDS.

The educational reforms that will drive NEEDS agenda must necessarily be on individual school subject basis. Basic and all senior secondary school science subjects are yet to live up to this call: “Youth empowerment and development (is needed) to reverse the rising incidence of social ills among young people” (Abonyi&Okoli, 2009:23). Uchenna (2011:198) opined thus: “if the Federal Government is interested in arresting the deteriorating standard of the Nigerian education as to realize the vision 20-20-20, four major problem areas must be tackled. These problem areas are: Review of the theory oriented curriculum of Nigerian education from primary to the university level. The curriculum must be geared towards making our educational system more pragmatic or practically oriented...”

The very many negative notions of the Nigerian education system together with many seemingly plausible suggestions offered by the academic community must have resulted in reforms in the education industry generally and in the curricula in particular, early this century. One of such reform is the introduction of or should we say “re-introduction” of entrepreneurial education in the curriculum. This was not only done by expanding entrepreneurially-skewed content of most subject at all levels, new subjects were carved out of existing ones as Trade Subjects and made compulsory at the secondary school level. Every graduating secondary school student must offer at least one trade subject: Animal Husbandry, Fishery, Garment Making, Data Processing, Tie and Dye, to mention but a few.

Some scholars agree that the most important aim of introducing entrepreneurship education is to “break the cycle of poverty that has ravaged the citizenry for decades un-end” (Onwukwe & Agommuoh, 2016:41). The call for educational reform has been headed to. Subjects that enhance the acquisition of entrepreneurial skills have been introduced. The consciousness of parents, teachers and students has been awakened. It is now commonly accepted that for today’s education to be relevant there is need for students to be creative, exploring and practical during the school life of the individual. However, it is disturbing that observations show that “Schools still have difficulties in offering entrepreneurial education to students due to lack of amenities and infrastructure such as workshops and basic tools” (Onwukwe & Agommuoh, 2016:41). Such activities are organized as methods and approaches, they will enable students to acquire the needed skills and experience need to individual contributions that when pulled together will sum up to sustained national development.

Project-based teaching and learning are highly experiential. Acquire and apply new knowledge in a problem-solving context”. Another one is Field trip method of teaching and learning. Kenna (2014) describes field trips as one such motivation to learning. “When inquiring about why teachers use field trips the answer undoubtedly always comes back to some form of students learning or motivation” (P.3). This notion is corroborated by Behrendt and Franklin (2014) when they opined that “Teachers are in a position to motivate and capture students’ interest in science. Effective methods to develop students’ interest include experiential activities and field trips...” (P.236).Field trips and project works seem to hold the promise of providing students the opportunity to acquire

entrepreneurial skills. Cakici & Turkmen, (2013:10) point to this fulfillment on the side of the learner in projects: "... Attitudes toward science are considered to influence future behaviors, such as interest in working on a science project". The focus of this study was on the effects of project teaching and learning method among secondary school students as an entrepreneurial activity and hence the need to elaborate on some concepts associated with this method.

A school based project contrasts with an assignment. The purpose of both is to get the learner engaged epistemologically. While knowledge making and understanding must necessarily require time on task, assignments get done within a shorter period of time and may engage fewer of the learner's faculties. Projects on the other hand last over a longer period of time and so engage more of the learner's faculties. According to Pearson Education Limited (2003:1311) a project is part of "a school or college course that involves careful study of a particular subject over a period of time".

Gill (2014:3) has gathered several definitions of projects including: "...a whole hearted purposeful activity proceeding in a social environment". Project is "a voluntary undertaking which involves constructive effort or thought and eventuates into objective results". Many professional teachers and educational personnel advocate for Project-Based-Learning (PBL) and Project-Based-Teaching (BPT).

STATEMENT OF THE PROBLEM

The present researchers believe that curriculum reform is one thing and its implementation yet another. One of the ways to make science and technology education come alive in the classroom is to let the learners get engaged through activities. This bridges the gap between theory and practice. The teacher may have the curriculum and its prescriptions handy and may be docile and let the status quo continue.

In the senior secondary, learning through project activities is envisioned by academics as motivator to not only skill acquisition but also to understanding the relationships between knowledge, products and solutions to practical problems. This is a kind of reinforcement that helps learners to explore phenomena in their natural environment and put into practice what they study in the area of science and technology (Nnachi, 2010). Since curricula in science and technology have been reformed, science and trade subjects are now offered in secondary schools. Will effectively engaging students in projects enhance achievements and enrollment in science and technology subjects?

OBJECTIVES

If students are being taught entrepreneurial education as it ought to be in Nigeria, it will definitely enhance their performance generally and their achievement is particular. It will be proper to isolate schools that are actually encouraging entrepreneurial and experiential education through their various subject offerings and compare their achievements on one hand and on the other hand to determine if the more entrepreneurial skill acquisition activities a student is engaged in, the better his or her achievements will be in those subjects.

The main purpose of this study was to find out the effects projects as entrepreneurial activities have on achievements of Secondary School Students in Science and technology subjects. In detail, however, the study aimed at finding out the following:

1. Comparative achievements of Senior Secondary School students in the trade subject of Animal Husbandry with specific projects and those who did not have specific projects.
2. Effect of multiple projects on students' achievements in the trade subject of Animal Husbandry.
3. The enrollment of male and female senior secondary school students in Animal Husbandry as the number of specific projects increased overtime.

RESEARCH HYPOTHESIS

Three null hypotheses were tested in this study.

1. HO1: There is no significant difference in the mean achievement scores in animal husbandry of SS2 students who carried out specific projects and those who did not.
2. HO2: There is no significance difference in the mean achievement scores in animal husbandry of SS2 students who carried out three, two and one specific projects during the session.
3. HO3: There is no significance difference in the enrollment figures of male and female SS2 students in animal husbandry when one, two and three specific projects are provided for the class during a session.

SIGNIFICANCE OF STUDY

This study is hoped to generate dependable data, which when analyzed and summarized can guide educational actions of both teachers and students. Teachers will be able to direct their teaching such that students will maximize learning. Students, when convinced of sure steps towards meaningful achievements and other high performance indicators, will be self-motivated and more cooperative with their teachers for their training. Furthermore, the outcome of this study will be a reference material for professionals in the field to support their own actions or draw contrasts that will clarify events and actions related to teaching and learning of science and technology in secondary schools.

THEORY

The basic theoretical framework for this study is the "Experiential Learning Theory" (ELT). According to Kolb, Boyatzis and Mainemelis (1999) ELT defines learning as "the process whereby knowledge is created through the transformation of experience. The theory is said to place emphasis on the role played by experience during knowledge making processes otherwise called learning.

The essence of projects is to enable students to gather direct experience through various faculties and learning modes. Listening to tales about an object is one experience while the sight of that object is yet another. The touch (feel) of that object is quite a different experience from manipulating that object for a specific purpose. According to the experimental learning theory, these modes of experiences afford students the opportunity to construct knowledge that is retained, related and

transferred.

The project teaching method is particularly based on the “philosophy of pragmatism and the principle of learning by doing” (Gill, 2014:3). The project method affords the learners the opportunity to be engaged in constructive activities in natural conditions. It is inspiring because the learner is eager to see the outcome of his personal endeavors and is thereby encouraged to persevere in doing and in learning; that is constructionism (Grant, 2002).

As a science and even technology-based subjects teaching strategy, projects are also said to be grounded in constructivism in the sense that the learner’s knowledge so gained is quite personal. This personal construction of knowledge enables him/her to “relate new knowledge to prior experience, or socially, through interaction with people around, such as friends, teachers, family etc.” (Cakici& Turkmen, 2013:9) This theoretical model corroborates the activities of students used in this study in their project work: Planning, constructing, market surveys, pricing, monitoring, and duty slot keeping were all part of participants’ experiences.

In answer to the call for curricula reforms to accommodate entrepreneurial skill acquisition, “Trade subjects” were added and made compulsory for all secondary school students. It is the responsibility of the teachers and their schools to adopt teaching strategies to meet these national goals. Onwukwe and Agommuoli (2016:41) opined that “science and technology education through projects and field trips bring these issues to the attention of students within a locality...” The authors proceeded to propose a system of education whereby each school is meant to adopt a particular trade subject through which her graduates acquire specific entrepreneurial skills. A number of options were marshaled out for schools to choose from including Animal husbandry. Many authors are of the opinion that projects enhance students’ performance in many areas of their development. The approach itself incorporates other approaches and methods making learning more in-dept. Muriithi, Odundo, Origa and Gatumu (2013) believe that project approach to teaching combine for effectiveness with the lecture method. The authors describe the project approach as a “teacher-facilitated collaborative approach” (P.2). This agrees with views of Roessingh and Chambers (2011) who described the instruction mode in projects as mediated and integrated, affording the students the opportunity to develop critical reflection and higher-order thinking skills.

Critics of group project method of teaching and learning have some reservations. Grant (2002) for instance, observes that “students that are inexperienced with working in groups may have difficulties negotiating compromise” (P.2). This is what teachers may look out for while designing projects and grouping of students. Some critics are concerned with the time required to implement the strategy. “This method takes a lot of time to plan and execute a single project” (Gill, 2014:5). The author equally observed that it is not that easy to design a different project for different topics neither is it possible to use a single project to cover the content of a single topic. Not every teacher is gifted, creative and constructive enough to make the best of projects for students’ benefits. Yet other critics

have equally looked at the influence of more active students on others in constructivist teaching techniques as exemplified by school-based group project works. This leads to slacking off or sitting back to let others to do project work. Some have even been so harsh as to describe the teaching and learning models pedestal led on active learning as “educational disaster” because physical activity does not equate to cognitive activity or learning (Wikipedia, 2016).

Notwithstanding these criticisms some empirical studies record some successes in the applications of entrepreneurial projects in secondary school teaching and learning of science and technology subjects. Quasi-experimental design was used. Eighty-four schools were sampled and all physics teachers in the schools participated in the study. Data collected was student’s achievement scores in physics. The analysis showed a significant difference in achievement of students exposed to projects when compared to those who were not.

DESIGN AND PROCEDURE

In this study, quasi-experimental design was adopted. It was a pre-test-post-test, intact (non-randomized) classes control group design. Area of study was Owerri Municipal Council. Alvana Model secondary school, Alvan Ikoku Federal College of Education is the case study. The school is a reputable secondary school and among the very few that had the personnel and facilities to teach Animal Husbandry in a project method among many schools in the state. This rarity informed the study design.

The population of senior secondary class two (SS2) students of Alvana Model Secondary School for the academic sessions of 2012/2013, 2013/2014, 2014/2015 and 2015/2016 summed up to 1,400. The population of the study is therefore 1,400. The sample was drawn from SS2 students who offered Animal Husbandry between 2012 to 2016, totaling, 492.

PROJECT WORK INTERVENTION STRATEGY

The treatment procedure for the project work intervention strategy consisted of providing an opportunity for SS2 students to offer Animal Husbandry as a trade subject with varying number of specific projects for the students over a four year period of time. In the first year, Animal Husbandry together with other trade subjects like tie and dye, catering, garment making, data processing and so on were provided for students to choose from and enroll for classes.

The first group of students that enrolled for Animal Husbandry in 2012/2013 session were taught this subject without any specific project throughout the session. They wrote terminal examinations in the subject and their average cumulative scores calculated. These students formed the control group for this study.

In the second, third and fourth years, the same provisions and opportunities were made for SS2 students expect that students were required to participate actively in specific group projects. These

specific group projects were being increased in number and type over the period of time as follows:

- i. One specific project of poultry keeping group.
- ii. Two specific projects of poultry and rabbit keeping group.
- iii. Three specific projects of poultry, rabbit keeping and fishery group.

The activities of the specific projects comprised of

- i. Choosing and planning for the specific project
- ii. Construction of the cages/pens and ponds required to raise the livestock with expert advice and assistance.
- iii. Market surveys for the items required
- iv. Purchases of the items required
- v. Drawing of the time table and apportioning duties to individuals/groups of students
- vi. Monitoring of the duty roster.
- vii. Advertising and marketing of stock.

Some of the specific projects spilled over holidays and even beyond a particular term. In spite of these extended times, the students were encouraged to observe their duties as a lapse in responsibility could jeopardize the entire project. Every participating student got some slots of duty for weekends or holidays. Normal class lessons by the same subject teacher held throughout the duration of this research.

ADMINISTRATION OF TEST

For this case study, normal termly examinations according to school time table which stipulated one week revision of work before written class examinations. This was done termly for three terms in each session. Examination tests were teacher made and guided by the national syllabus on Animal Husbandry which tested students overall performance according to the termly scheme of work. Academic achievement observational schedule was constructed in which was recorded students' enrollment and examination results termly. Achievements were summarized as SS2 cumulative percentage score. The test instruments were not validated neither was their reliability indices calculated.

DATA ANALYSIS

The main data collected in this study were achievement scores and enrollment figures. The research questions were answered using means and standard deviations and proportions while the hypotheses were tested with Analysis of Covariance (ANCOVA)

RESULTS

H01: There is no significance difference in the mean achievement scores in Animal Husbandry of SS 2 students who carried out specific projects and those who did not.

Table 1: Summary of t-Test on specific and non-specific projects in Animal Husbandry

achievement scores of students

Project Group	N	Mean	SD	T	Df	p-value	Decision
No SPG	79	49.50	15.34	18.650	416	0.000	Reject H ₀
SPG	339	78.66	11.77				
Total	418						

From the results in Table 1, the alternative hypothesis is retained thus: There is significance difference in the mean achievement scores in Animal Husbandry of SS 2 students who carried out specific projects and those who did not.

H02: There is no significant difference in the mean achievement scores in Animal Husbandry of SS 2 students who carried out three, two and one specific projects during the session.

Table 2: Mean scores of different Numbers of specific project groups.

Project Group	N	Mean	Std. deviation
One SPG	85	77.2141	11.10452
Two SPG	150	78.6580	13.11584
Three SPG	104	79.8452	10.09518
Total	339		

Table 3: Summary of ANOVA on Mean scores of different Numbers of specific project

Scores					
	Sum of squares	df	Mean Square	F	Sig.
Between groups	323.786	2	161.893	1.170	.312
Within Groups	46486.826	336	138.354		
Total	46810.612	338			

From the results of the ANOVA as shown in Table 3, the statement of hypothesis 2 is accepted; implying that the small differences observed in mean values as number of specific projects increased is not significant at 0.05 significant level.

H03: There is no significant difference in enrollment figures of male and female SS2 students in Animal Husbandry when three, two and one specific projects are provided students

Table 4: contingency table on gender and enrollment of students in different numbers of specific projects

Gender	Enrollment				Total
	No-SPG	1-SPG	2-SPG	3-SPG	
Male	52	55	99	62	268
Female	27	30	51	42	150

Total	79	85	150	104	418
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Table 3: Summary of Chi-square test of independence on gender and specific projects

	Value	Df	Asymp. Sig. (2-sided)
Pearson Chi-Square	1.260 ^a	3	.739
Likelihood Ratio	1.247	3	.742
Linear-by-Linear Association	.587	1	.444
N of Valid Cases	418		

The results show the summary of Chi-square test of independence on gender and specific projects in Animal Husbandry. Since the p-value (0.739) is greater than our chosen significance level (0.05), we do not reject hypothesis 3. Rather, we conclude that there is no enough evidence to suggest an association between gender and enrollment of students in more specific projects in Animal Husbandry. Based on the results, we can state that no association was found between gender and enrollment of students in more specific projects ($\chi^2=1.260, p=0.739$).

The conclusions and implications of the findings of this study include the following:

Experiential teaching and learning strategies such as project will enhance secondary school students' achievements in Animal Husbandry specifically and generally in all some other areas of their performance.

Over stretching a particular strategy, especially project works, may kill motivation of students to enroll in science and technology subjects like Animal Husbandry. Entrepreneurial education can leverage on project teaching and learning methods as well as on trade subjects to re-orientate the minds and the practice of teachers and students towards 'education for relevance maxim'

RECOMMENDATIONS

Some of the recommendations emanating from the findings of this study include but may not be limited to the following:

Entrepreneurial education as proposed by education reforms of the 1990s should be adopted by the secondary school system. Students' specific project works and the trade subjects should be used to drive it in a real practical way.

This study may have been limited by the case study design which may limit the generalization of the findings.

Further studies could be carried out in the areas of factors limiting the implementation of

entrepreneurial education strategies in schools.

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