British Journal of Education

Vol. 1, No. 1, pp. 1-6, September 2013

Published by European Centre for Research Training and Development UK (www.ea-journals.org)

A CHEMISTRY CLASS WITH KITCHEN RESOURCES AND STUDENTS' ENTREPRENEURIAL ABILITY

Nja, Cecilia Obi (Ph.D) and Neji, Hope Amba

Department of Curriculum and Teaching, University of Calabar, P.M.B 1115, Calabar, Cross River State, Nigeria

ABSTRACT: *This paper examined entrepreneurial ability of chemistry students when taught saponification reaction with and without kitchen resources. Saponification reaction was taught using kitchen resources such as, ashes of unripe plantain, ashes of cocoa peels, ashes of husks of oil palm husks, palm oil, vegetable oil, coconut oil and kernel oil were used for the experiments. The sample comprised of 200 students drawn from four secondary schools in Calabar Education Zone of Cross River State. Two schools were used for experimental (using kitchen resources) and two for control (without kitchen resources). Cronbach was used to establish reliability of the instrument which was 0.81.The research used a mix design (quasi experimental and survey design) and 10 items questionnaire as instrument for the research. Data obtained were analysed using independent t-test .The results gave a significant t-value of 4.85. There was a significant difference in the entrepreneurial ability of chemistry students taught saponification reaction with and without kitchen resources. Teachers are encouraged to use kitchen resources in the teaching of chemistry to make students small entrepreneurs.*

KEYWORDS: Entrepreneurial ability, kitchen resources, students, teachers and unemployment.

INTRODUCTION

Education is to teach one to think intensively and to think critically. Education must enable one to sift and weigh evidence, to discern the true from the false, the real from the unreal, and the facts from the fiction (The Purpose of Education, 2013). Education is to produce a skilled workforce, help students to become critical thinkers (SAP Voice, 2012).

Nigerians graduates are not critical thinkers and as such wait to be employed either by government or companies. Every year Nigerian Colleges and Universities are producing millions of graduates without enough private and public sectors to employ them. Unemployment as used in this paper referred to people who are willing and are capable to work but are unable to find suitable paid employment. Youth unemployment in Nigeria has assumed a dimension that is now called "A MONSTER". Unemployment is a problem that each society faces, and each society must find a way to beat it. Unemployment is one of the developmental problems that face every developing economy in the 21st century. Nigeria unemployment rate averaged 14.60 percent from 2006 until 2011, reaching an all time high of 23.90 percent in December of 2011 and a record low of 5.30 percent in December of 2006 (National Bureau of Statistics, 2013). In Nigeria, the unemployment rate measures the number of people actively looking for a job as a percentage of the labour force.

The last decade has witnessed the powerful emergence of entrepreneurship research worldwide (Kuratko, 2003). There seems to be widespread recognition that entrepreneurship is the engine driving the economy and society of most nations (Acs, 1992; Carree and Thurik, 2002). Entrepreneurship is a dynamic process of vision, change and creation. It requires an application of energy and passion towards the creation and implementation of new ideas and application of energy and passion towards the creation and implementation of new ideas and creative solutions. Essential ingredients include the willingness, to take calculated risks in terms of time, equity or career, the ability to formulate an effective venture team, the creative skills to marshal needed resources; and fundamental skill of building solid business plan; and finally the vision to recognize opportunity where others see chaos, contradiction, and confusion (Kuratko & Hodgetts, 2004.

A wide range of competences are seen as entrepreneurial and useful to entrepreneurs, these include knowledge, skills and personal traits: management skills ability to manage time and people both oneself and others successfully. Communication skill (the ability to sell ideas and persuade others). Entrepreneurial ability enables one to work both as part of a team and independently. Able to plan, coordinate and organize effectively, self-motivated and discipline, innovative and creative thinker, the ability to multi task, the ability to work under pressure, competitiveness, ability to network or make contact.

If schools leavers are to have entrepreneurial ability enabling them to be entrepreneurs, the teaching and learning situation should be that which will provoke their thinking and turn them to creative thinkers. Such learning processes in and out, of the classroom can be active, experimental, challenging and entrepreneurial (2GETHER, 2013). We need to equip our students with different types of 'life skills', or most importantly, the ability to adapt to changing circumstances and acquire new skills and new learning. In fact, we need to prepare our students for jobs that have not yet been invented. The best way, is to enable them to acquire personal entrepreneurial capacity to deal with the far greater levels of uncertainty, complexity and even periods of chaos in both their work and personal life (Hagen, 2012).
The significance of this study is that the findings will give us insights on the effectiveness of kitchen resources in facilitating students' entrepreneurial ability.

LITERATURE/THEORETICAL UNDERPINNING

Constructivism is a learning theory and epistemology that has influenced much of science education lately. It states that students construct their knowledge of the world through their past experiences. Students do not learn much just by sitting in class listening to the teacher, memorizing repackaged assignments, and spitting out answers. They must talk what they are learning, write about it, relate it to past experiences, and apply it to their daily lives. They must make what they learn part of themselves. Vygotsky's social constructivist theory states that learning takes place in a social context and that in interaction with others (Palinscar, 2005). Students are encouraged to say and do when working with kitchen resources. Active learning offers a paradigm for students learning that differs from the traditional lecture method-based model. Edgar-Dale's (1969) cone of experience/learning show that learners only remember 10%

of what they read, 20% of what they hear, 30% of what they see, 50% of what they hear and see, 70% of what they say and 90% of what they say and do. The research was conducted within the theoretical context of social constructivist theory and Edgar-Dale's cone of learning experience. Students are encouraged to say and do when working with kitchen resources. Teachers who are concerned with students' emotional, social and academic needs have been found to encourage more students' involvement in lessons. Active learning offers a paradigm for students learning that differs from the traditional lecture method-based model (Johnson, Roger and Karl, 2006). .

The kitchen Chemistry aims to change the traditional method of teaching, where students are taught to memorize and spit back information during examinations by bringing into the classroom all the resources and information that are needed to run experiments (Helmestine, 2010). Kitchen Chemistry was set up by Johnson (2005) to create innovative science resources that make the teaching of science easier for teachers and more fun for the pupils. Kitchen resources promote collaborative learning, team building, and enterprise in education. It can challenge even the most able students while offering support for the weaker pupils. Chemistry teachers must think on their feet. While Chemistry is an exact science, the teaching of Chemistry often requires creativity and improvisation. To make Chemistry concepts comprehensible to students as to enhance their entrepreneurial ability, the teachers must employ creative teaching methods and be prepared to respond to queries or explain concepts in a typical manner. Teachers who are adept at improvisation will likely be more successful in imparting Chemistry information to the novice Chemists in their classes and therefore making them entrepreneurs (Schreiner 2012).

METHODS/MATERIALS

The researcher used quasi experimental and survey design for the study. An entrepreneurial ability questionnaire (EAQ) comprising of 10 questions with four levels was administered to students in four schools in Calabar Education Zone of Cross River State, Nigeria. The first two schools were taught saponification reaction using kitchen resources while the last two schools were taught saponification reaction without kitchen resources. The 10 item EAQ questionnaires were given to chemistry students in the four schools after teaching with and without kitchen resources. A total number of respondents were 200 students. Their responses were coded and analyzed using independent t-test.

RESULTS/FINDINGS

One null hypothesis was formulated to guide the research: There is no significant difference in the entrepreneurial ability of chemistry students when taught with and without kitchen resources was tested.

Independent t-test showing entrepreneurial ability of Chemistry students taught saponification reaction with and without kitchen resources variables.

Variables	$\bar{X}$	n	SD	t
Experimental group (taught with kitchen resources)	27.30	100	7.37	4.85
Control group (taught without kitchen resources)	22.30	100	7.23	

*P<.05 df = 198 critical t=1.98

DISCUSSION

From the analysis of data obtained, it was revealed that students taught chemistry using kitchen resources had a higher mean of 27.30 in their entrepreneurial ability when compared to their counterparts' mean of 22.30 taught without kitchen resources. The independent t-test value of 4.85 was higher than the critical 1.98 at 0.05 confidence level with 198 degree of freedom. Therefore the null hypothesis stating that there is no significant difference in the entrepreneurial ability of chemistry students when taught with and without kitchen resources was rejected**.**

Kitchen resources in Chemistry classroom significantly affected students' entrepreneurial ability according to the study because prior to the class, students were told the resources for the next class. Students gathered the resources for the class that may have posed a lot of questions in their minds what kitchen resources would be doing in a Chemistry class. They came into the class with high expectant minds about to learn. These made the class very interactive as they asked the teacher questions, interacted with the resources, performed simple experiment and went home with the soap they produced. The excitement made the students to perform the experiments over and over not wanting to go home. This would have lead to high entrepreneurial ability .This finding was in line with the work of Das (2011) that students working in group will develop teamwork skill and promote idea exchange between students from diverse backgrounds will facilitate ability level in Chemistry.

IMPLICATION TO RESEARCH AND PRACTICE

Teaching with kitchen resources got students actively involved in the learning and teaching situation. Students sourced for the materials at home and brought them to the classroom. The acid base reaction was explained with kitchen resources and students carried out the neutralization reaction which ended up in the preparation of soap. A lot of questions and trial experiments took place. Students attempted to change the colour of the soap they prepared by using different dyes.

Students active participation and perhaps the use of materials that they have being familiar with (kitchen resources) would have led to their high entrepreneurial ability level. This work agrees with the paper by Capener (2012) teaching for entrepreneurial ability involved the use of activities that engage students leading to students' immersion in the materials and making of progress.

CONCLUSION

Chemistry is an activity based subject and therefore if the desire of Nigerian teachers is to produce school learners who can be economically comfortable without waiting for white collar jobs that are not available. Kitchen resources should be used in the teaching of chemistry students.

FUTURE RESEARCH

The suggested areas of further research that may inform members of the academic community on the need to intervene in the secondary school education sector are: A replication of the present study in Ikom and Ogoja Zones of the state could help to broaden the scope of coverage. This will clearly show how students' entrepreneurial ability are enhanced when taught using kitchen resources. The present study concentrated on Calabar Educational Zone.

Further study of this nature may consider other topics in Chemistry. The study can also be extended to other science subjects. This would provide a wider view in general Science education. A study of the effect of teaching with kitchen resources on students' interest in science can be conducted.

REFERENCES

Acs, Z. J. (1992). Small business economic: A global perspective. *Challenges*, 35, 38-44.

An educated man (2013). Michigan State University. www.msu.edu/../educatedperson

Capener, D. (2012). Teaching to the test.

Carree, M. A. & Thurik, A. B. (2000). The impact of entrepreneurship on economic growth. In Audretsch, D. B. and Acs, Z. J. (eds). *Hand book of entrepreneurship*, Boston: Kluner Academic Publisher.

Das S. R. (2009).The kitchen chemistry sessions. Retrieved from http://www.chem.cmu.edu/groups/das/.onmarch20,2011

Dewey, J. (1916/1944). *Democracy and education*. The Free Press.

Educational Wilkipedia (2013) en.wikipedia.org/wiki/education.

Kuratko, D. F. & Hodgetts, R. M. (2004). Entrepreneurship: Theory, process, practice (Manson, Oh; South-Western Publishers.

Kuratko, D. F. (2003). Entrepreneurship education: Emerging trends and challenges for the 21st century. Coleman Foundation White Paper Series for the USASBE.

2GETHER:Project Report (2013)highlands schools-virtualib.orguk

Hagen S.(2012) Creating the entrepreneurial university: The Educational Ratinale.www.unilliance.ac.uk

Helmestine, M. A. (2010). science experiment from the kitchen *http:// Chemistry. about.com/ b2011/09/17/*

Johnson, D. W., Roger, T. J., & Karl, A. S. (2006) *Active Learning: Cooperation in the college classroom*, 3rd ed. Edina MN: Interaction Book Company

Johnson, P. (2005) *Kitchen chemistry* @ tiscali.co.uk (2005)Nigeria unemployment rate (2013) www.trading.economics.com/Nigeria

Palinscar, A. (2005). Social Constructionist perspectives on teaching and learning. In H. Daniels (ed) *An Introduction to Vygotsky*. London Routledge

Rogers, C. (1969) *Freedom to learn*. Columbs, OH: Charles MerrillSAP Voice (2012). What is the purpose of education forbes (www.forbes.com/sites/sap/2012.The purpose of education (2013). Mik-kppol.stanford.edu/index.

Schreiner, E. (2012) *Roles of Improvisation in Chemistry Teaching*. (www.ehow.com>ehow>education