



---

## CHEMISTRY EDUCATION AND ENTREPRENEURSHIP PROGRAMME

**WEPUAKA CHIYEM ARTHUR**  
DEPARTMENT OF CHEMISTRY  
FEDERAL COLLEGE OF EDUCATION (TECH.) BICHI

---

### ABSTRACT

This paper focuses attention on the central role of Chemistry education (or chemical education) as an instrument of self-employment through the inculcation of the correct entrepreneurial skills and competencies on its beneficiaries. It analyzes the concept of quality and functions of an entrepreneur and relates this to preparation in chemical education to minimize unemployment problem. Possible impediments like style of teaching, staff competence and staff motivation, entrepreneurship and curriculum issue to the realization of this objective are identified. Teachers retraining, motivation, the creation and maintenance of an enterprising culture in schools has been highlighted as ways to solving the problems identified.

---

### INTRODUCTION

An Entrepreneur is a person who has a possession over a company, enterprise, venture and assuming significant accountability for the inherent risk and the outcome. Entrepreneurship according to Onuoha (2007) is the practice of starting a new organization or revitalizing mature organization, particularly new businesses generally in response to identified opportunities. Entrepreneurship is often a difficult undertaking, as vast majority of businesses fail. Entrepreneurial activities are substantially different depending on the type of organization that is been embarked upon. Entrepreneurship ranges in scale from solo projects (even involving the entrepreneur only part-time) to major undertakings creating many job opportunities.

Large scale unemployment is one of the greatest problem facing Nigeria today. In spite of the abundant natural resources that the country is endowed with, unemployment especially among young school leavers remain a serious problem (Blunt 1983).

As a country in a haste for technological growth and national development, Nigeria's cardinal educational objective radiate around becoming a united, strong and self-reliant nation. The

national policy on education therefore, makes a special focus on entrepreneurial education in the hope of producing graduates to serve the industries or be self-employed. But since most industries are operating below capacity (Akibu 1997) and many are indeed folding up, self-employment through development of entrepreneurship deserves attention.

Entrepreneurship education seeks to provide students with the knowledge, skills and motivation to encourage entrepreneurial success in a variety of settings. What makes entrepreneurship education distinctive is its focus on realization of opportunity, where management education is focused on the best way to operate existing hierarchies. Both approaches share an interest in achieving "profit" in some form (which in non-profit organizations or government can take the form of increased services or decreased cost or increased responsiveness to the customer/citizen/client).

Opportunities can be realized in several ways. The most popular one is through opening a new organization (e.g. starting a new business). Another approach is to promote innovation or introduce new products or services or markets in existing firms. This approach is called corporate entrepreneurship or intrapreneurship. A recent approach involves creating charitable organizations (or portions of existing charities) which are designed to be self-supporting in addition to doing their good works. This is usually called social entrepreneurship or social venturing.

### **Entrepreneurial Competencies in Chemical Education**

Entrepreneurship is the practice of starting new organizations or revitalizing mature organizations, particularly new businesses generally in response to identified opportunities. Entrepreneurship is often a difficult undertaking, as a vast majority of new businesses fail. Economists describe an entrepreneur as a risk taker because of his willingness to recognize and take challenges either in starting a new business or in developing a new product or exploring a

new locations all in an attempt to meet unsatisfied demand at a profit. This demands self-confidence and optimistic individualism. Competition is inevitable in business, and this is a major differential factor between the public and private sector. Competition necessitates a distinctive competency which is the ability, based on education, training and experience to compete effectively and excel above all others. The business culture is survival of the fittest.

Entrepreneurship also demands originality, an entrepreneur has to be knowledgeable, versatile, flexible, forward-looking, resourceful and innovative or creative. These are the essential ingredients of distinctive competencies of an entrepreneur.

The foregoing attributes are necessary to enable an entrepreneur execute his/her functions successfully. Kolawole (1997) identified six main functions of an entrepreneur as follows:

1. Identification of opportunities: understanding the needs and wants of potential customers
2. Evaluation of opportunities and choice making: This involves evaluating the profitability index, personal interest or desire of the entrepreneur.
3. Decision on form of enterprise: This include the cost and procedure of starting the business/legal requirements in the formation and operation of the business, talents, skills needed etc.
4. Factor combination: This entails decision on what to produce, where, when, how, by whom and machines and equipments with which the assignment is to be carried out.
5. Business Directorship: This include putting in place the entire management structure and function, planning, organising, staffing, coordinating and controlling
6. Risk management: This is the creative response to an investment opportunity through the development of new product, new technology or the modification of existing one to serve a better need.

### **Preparation in Chemistry Education for Entrepreneurial Competencies**

Chemistry education (or chemical education) is a comprehensive program that includes areas related to the study or description of the teaching and learning of chemistry in secondary schools, colleges of education, polytechnics and universities. Topics in chemistry education might include understanding how students learn chemistry, how best to teach chemistry, and how to improve learning outcomes by changing teaching methods and appropriate training of chemistry instructors, within many modes, including classroom lecture, demonstrations, and laboratory activities. There is a constant need to update the skills of teachers engaged in teaching chemistry, and so chemistry education speaks to this need.

The curriculum design for chemistry education in Nigeria tertiary institutions is meant to cater for entrepreneurial competencies and eventual self-employment. These programmes are mounted by polytechnics, technical colleges of education and technical teacher's education.

The focus of Chemistry is on understanding the basic properties of matter and employing this knowledge in the design, synthesis and characterization of substances with novel and useful properties. Chemistry education strives to develop all aspects of the student's chemical knowledge via a broad range of lecture and laboratory courses. Chemical research is an integral part of the chemical education, and students are encouraged to participate in projects as a method of expanding their chemical training and developing an understanding of what is involved in the chemical research enterprise. Chemistry plays a key role in a number of interdisciplinary areas,

particularly as it interfaces with biological and materials science. Chemistry is taught in schools to achieve the following objectives:

1. To provide basic literacy in chemistry for functional living in the society.
2. To acquire basic concepts and principles as a preparation for further studies.
3. To acquire essential scientific skills and attitudes like the making of soap,

detergents etc as a preparation for the technological application of chemistry.

4. To stimulate and enhance creativity.

Correspondingly, Chemistry education provides a broad range of employment opportunities in the following areas:

1. All area of industry, from oil, chemical and pharmaceutical industry, fertilizer production, plastics, glass, metallurgy, ceramics, soap, detergents, food, drinks and a host of small enterprises producing new and specialist products.
2. In public health and environmental protection.
3. In teaching at all level.
4. In forensic science.
5. In research in universities, government institutes, industry and private agencies.
6. In numerous other occupations which make use of their scientific knowledge.

### **Problems of Chemistry education in Developing Entrepreneurial skills/competencies.**

**Style of teaching:** teachers should display dexterity when it comes to practical demonstration as a method of teaching.

**Staff competence and staff motivation:** very many members of staff in this category lack the practical competencies in their discipline and are only good in theory; such staffs need to be identified for retraining especially in area where technological advancement is rendering their acquired skill obsolete.

Teacher motivation is a typical issue in Nigeria today. The reward system has been faulted by many observers and social critics. An old adage that a dissatisfied worker is an unproductive worker hold firmly.

**Entrepreneurship and curriculum issue:** The non-inclusion of entrepreneurship as a course in the curriculum of most institutions is a major problem of the entrepreneurship programme.

### **Conclusion**

Every entrepreneur believes his or her company will succeed; it is perhaps this very optimism that forms the foundation of an entrepreneur's character. And, it may also be this optimism and unflinching positivism that attracts many to study and to teach in the arena of entrepreneurs. Though research and entrepreneurial activities may compete for a scientist's time, the relationship between these activities need not be negative if they have mutually beneficial side effects.

Much of the discussion in entrepreneurship education continues to focus on how to motivate young people as though these were motivations that they have never possessed. People are indeed born with ambition, motivation, and a willingness to take risks, but encounter barriers that erode this spirit of adventure (Rabbior, 1990); His message is one that we might still remember as we continue to develop new programs. We should examine our existing systems of education at all levels and seek to remove as many barriers, political and pedagogical, as possible that erode self-confidence and self-esteem and, along with them, the spirit of adventure and the willingness to take initiative and risk--the spirit of entrepreneurship

### **Recommendations**

1. Entrepreneurship development should be made a compulsory course for all chemistry students in Nigeria tertiary institutions.
2. Teachers at this level should be given opportunity for occasional retraining and frequent exposure to the industrial world and interaction with practitioners.
3. Teachers motivation should receive attention from all tiers of government through prompt payment of workers salary and fringe benefit
4. The creation and maintenance of an enterprising culture in schools should be encouraged

## References

- Akibu, I.A. (1997) Secretarial efficiency in an economic depression: A managerial option secretary practices in a depressed economy“. Workshop proceeding of National Association of professional secretarial staff of Nigeria (NAPPSON) Jos University Teaching Hospital 6<sup>th</sup> - 7<sup>TH</sup> October.
- Blunt, P. (1993) Organizational theory and behaviour An African Perspective, London: Longman.
- Kolawole, S.O (1997) Entrepreneurship Education in Olaleye O.A and Aderotimi, (Eds). Entrepreneurship. Akure: Bohan press and publication.
- Onuebunwa S.E (1994), Improving the efficiency of Industrial Skills Development programmes through effective application of educational technology. Journal of technical education Research and Development, federal college of education (technical) Umuze, Anambra State Vol. 1 No. 1 PP 138-144
- Onuoha G., (2007) “Entrepreneurship“ AIST International Journal 10:20-35
- Ronstadt, R. (1990) Entrepreneurship Training for regional growth and Innovation, In Entrepreneurship Education: Current Developments, Future Directions, Kent, C. A. (Ed.) (pp. 86-86). New York: Quorum Books.
- Rabbior, G. (1990).Four (4) Elements of a Successful Entrepreneurship/Economics/ Education Program. In Kent, C.A(Ed) Entrepreneurship Education: Current Developments, Future Directions, (pp. 53-65). New York: Quorum Books.