Enhancing Entrepreneurial Mindsets through Pragmatic Entrepreneurship Education: A Study of Chemistry Undergraduates in Nigerian Universities

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Abstract

The evolving landscape of professional environments necessitates a departure from traditional education paradigms towards a more integrated and entrepreneurial approach. This study investigated enhancing entrepreneurial mindsets through pragmatic entrepreneurship education: A study of chemistry undergraduates in Nigerian Universities. The study employed a descriptive survey methodology, sampling 240 chemistry undergraduates from Ekiti State University, Ado-Ekiti. Data obtained using questionnaire was analysed using percentage, mean and SD. The instruments were duly validated by experts. The reliability coefficient of the instrument was 0.77. Key findings highlight that entrepreneurial internship programs, business incubation initiatives, practical applications, supportive regulatory environments, cross-disciplinary collaborations, and entrepreneurship competitions significantly enhance the entrepreneurial mindset. The study concludes that embedding these pragmatic practices into the chemistry curriculum can better align education with market demands, potentially mitigating unemployment among graduates. The study recommends that universities should collaborate with industries to offer internship opportunities where students can apply theoretical knowledge to real-world business scenarios.

Keywords: Intersection, Entrepreneurship skills, Chemistry Curriculum, Nigeria Higher Education

Introduction

The current landscape for which educators presently ready their students differs significantly from the environment in which public educational institutions were initially established. The approach rooted in the industrial era's assembly line mindset has transitioned into a collaborative method emphasizing the application of integrated skills and ideas across a wide

array of disciplines. To excel in the contemporary professional arena, graduates must surpass mere content proficiency and basic cognition (Gardner, 2006).

A primary goal of many institutions of higher education is to not only provide students with formal instruction but also to instill the necessary abilities and traits essential for attaining real-world success after graduation. Nevertheless, the considerable number of unemployed graduates can, to some extent, be linked to university curricula that do not conform to the fluctuating demands of the labor market (Mncayi, 2016; Ntale, 2022; Pitan & Muller, 2023).

The specified objectives of the chemistry curriculum, delineated by Das (2006) in the Journal of the National Teachers Institute (NTI, 2006), encompass:

1. Encouraging active engagement in the classroom.
2. Cultivating inquisitiveness and an entrepreneurial mindset.
3. Instruction in proper laboratory techniques and competencies.
4. Advocating for safe practices in everyday life.
5. Teaching the analysis of data from various origins.
6. Providing insights into potential career paths within the realm of chemistry.

Evidently, the cultivation of entrepreneurial abilities is ingrained within the chemistry curriculum, particularly through the fostering of an entrepreneurial spirit. Chemistry, serving as a fundamental science, is intricately intertwined with daily existence (Oyeku et al., 2015), finding applications in domains such as engineering, pharmacy, agriculture, and medicine, necessitating practical implementations of chemical knowledge to address immediate societal and developmental requirements (Suleiman, 2010).

Eya (2011) observed that multiple topics within the chemistry curriculum, including Organic Chemistry, Rate of Reaction and Equilibrium, and Acid, Base, and Salt, foster entrepreneurial skills in students. Conversely, topics like the Concept of Matter, Particulate Nature of Matter, Periodic Table, and Chemical Bonding exhibit lesser emphasis on entrepreneurship.
Chemistry presents pertinent subjects that can pave the way for entrepreneurial accomplishments. For example, Dike (2008) accentuated Environmental Chemistry as an excellent avenue for entrepreneurship, proposing that students could establish waste management services. Given the insufficient public waste collection services, graduates can capitalize on this gap and transform waste into a profitable venture.

Ugwu and Etiubon (2009) along with Jack (2012) affirmed that topics such as Color Chemistry, Metals and Their Compounds, and Medicinal Chemistry hold pragmatic real-world implications. When coupled with entrepreneurial instruction, chemistry education can engender innovations that yield substantial financial gains, generate employment opportunities, and positively influence the national economy (Lackeus & Middleton, 2015; Ramnund-Mansingh and Reddy, 2022).

In spite of these outlined objectives, Nigeria has witnessed a distressing surge in its unemployment rate. As stated by the Nigeria Bureau of Statistics (NBS, 2021), youth unemployment surged from 24% in January 2017 to 53.4% in 2021. The Foundation for Investigative Journalism disclosed in April 2023 that Nigeria ranks second globally in terms of the highest number of unemployed youths.

This unemployment trend emphasizes the necessity for a redefined policy approach within the realm of education, focusing on practical, high-impact entrepreneurship educational strategies that are in harmony with governmental directives to cultivate an entrepreneurial mindset among students (Yusoff, Zainol, & Ibrahim, 2015). The reallocation of chemistry students towards self-employment is proposed as a means to diminish unemployment, involving the development of self-assurance in executing specific duties (Nabi et al., 2017; Gelaidan & Abdullateef, 2017). Self-employment holds significant importance in entrepreneurial procedures as it impacts decision-making, resolve, and persistence (Al-Mamun et al., 2015; Boateng, 2019).

Moreover, individual competencies and a conducive regulatory framework have a favorable influence on entrepreneurial ambitions (Zreen et al., 2019). Variables such as administrative red tape, financial accessibility, societal perceptions towards failure, and parental viewpoints affect the attractiveness and viability of entrepreneurial professions (Stal et al., 2016) Empirical evidence demonstrates a significant correlation between business incubation initiatives and entrepreneurial self-employment, underscoring the significance of availing specialized programs within academic institutions (Jamil et al., 2016; Allahar & Brathwaite, 2016). Entrepreneurial internship schemes also wield substantial influence in cultivating an entrepreneurial mindset and competencies among university graduates, thus augmenting their employability and entrepreneurial acumen (Yi, 2018; Winantyo et al., 2018).

The provision of a conducive entrepreneurial ecosystem, encompassing financial backing, infrastructural amenities, and training, is imperative for fostering nascent enterprises (Sperber &

Linder, 2019; Nowiński et al., 2019). Notably, access to financial resources holds particular importance, given that numerous individuals forsake their entrepreneurial aspirations owing to financial constraints (Javed et al., 2018; Bienkowska et al., 2016).

This inquiry delves into strategies aimed at enhancing entrepreneurial mindsets through pragmatic entrepreneurship education: a study of chemistry undergraduates in Nigerian Universities, thereby catering to the imperative for entrepreneurship education in mitigating the unemployment quandary.

Objectives of the Study

This study explores enhancing entrepreneurial mindsets through pragmatic entrepreneurship education: A study of chemistry undergraduates in Nigerian Universities.

Specifically, the study intends to find out;

1 The pragmatic entrepreneurship education practices that can accelerate the entrepreneurial mindset among undergraduate students?
2 The factors that can influence the entrepreneurial intentions of chemistry undergraduate students?

Research Questions

1 What are the pragmatic entrepreneurship education practices that can accelerate the entrepreneurial mindset among undergraduate students?
2 What are the factors that can influence the entrepreneurial intentions of chemistry undergraduate students?

Methodology

Descriptive survey research was employed for this study. The sample population encompassed 635 undergraduate chemistry students at Ekiti State University, Ado-Ekiti, Nigeria. A total of 240 undergraduates were randomly chosen from the 300 and 400 levels; 60 students were chosen from each of the following categories: 300 level chemistry, 400 level chemistry, 300 level chemistry education, and 400 level chemistry education, totaling 240 respondents. Simple random sampling technique was utilized. The instrument's validity was confirmed through 3 experts in University of Ilorin, Nigeria. The reliability coefficient of the EEMPEEQ was found to be 0.77 using Cronbach alpha. Subsequently, the validated tool was administered to the respondents by the researcher. Data were analysed using descriptive statistics, employing percentage, mean, and standard deviation to address the research inquiries.

Results

Research Question 1: What are the pragmatic entrepreneurship education practices that can accelerate the entrepreneurial mindset among undergraduate students?

Table 1: Responses of chemistry education undergraduate students on pragmatic entrepreneurship education practices that can accelerate their entrepreneurial mindset.

Items	Mean	SD
Entrepreneurial Internship Programs	2.99	0.91
Business Incubation Programs:	3.01	0.86
Practical Applications and Projects:	3.21	0.76
Creating a supportive regulatory environment within universities, which includes reducing administrative bureaucracies and providing access to finance, can positively impact students' entrepreneurial aspirations	2.88	0.69
Facilitating cross-disciplinary collaboration between chemistry students and those from business or engineering faculties can lead to innovative entrepreneurial ventures	3.17	0.81
Organizing entrepreneurship competitions and workshops can stimulate students' creativity and entrepreneurial spirit	3.12	0.77

Table 1 showed that items 1, 2, 3, 4, and 5 have mean scores above 2.5 which serve as the baseline for affirming positive response. This implies that entrepreneurial internship programs, business incubation programs, practical applications and projects, creating a supportive regulatory environment within universities, which includes reducing administrative bureaucracies and providing access to finance, can positively impact students' entrepreneurial aspirations, facilitating cross-disciplinary collaboration between chemistry students and those from business or engineering faculties can lead to innovative entrepreneurial ventures and organizing entrepreneurship competitions and workshops can stimulate students' creativity and entrepreneurial spirit are pragmatic entrepreneurship education practices that can accelerate the entrepreneurial mindset among undergraduate students.

Research Question 2: What are the factors that can influence the entrepreneurial intentions of chemistry undergraduate students?

Table 2: Responses of chemistry education undergraduate students on factors that can influence the entrepreneurial intentions of chemistry undergraduate students

Items	Mean	SD
An individual's personal skills, such as creativity, problem-solving abilities, and resilience, significantly influence their entrepreneurial intentions	3.41	3.17
The availability of financial resources and infrastructural support is critical for fostering entrepreneurial intentions	3.11	2.85
A supportive educational environment that offers training, counseling services, and mentorship can nurture students' entrepreneurial aspirations	3.01	4.12
Exposure to successful entrepreneurial role models and mentors can inspire students to consider entrepreneurship as a viable career path	4.01	4.19
Participation in structured entrepreneurship education programs, such as workshops, seminars, and courses, can enhance students' entrepreneurial intentions	3.99	3.91

Table 2 showed that items 1, 2, 3, 4, and 5 have mean scores above 2.5 which serve as the baseline for affirming positive response. This implies that an individual's personal skills, such as creativity, problem-solving abilities, and resilience, significantly influence their entrepreneurial intentions, the availability of financial resources and infrastructural support is critical for fostering entrepreneurial intentions, a supportive educational environment that offers training, counseling services, and mentorship can nurture students' entrepreneurial aspirations, exposure to successful entrepreneurial role models and mentors can inspire students to consider entrepreneurship as a viable career path and participation in structured entrepreneurship education programs, such as workshops, seminars, and courses, can enhance students' entrepreneurial intentions are factors that can influence the entrepreneurial intentions of chemistry undergraduate students.

Discussion of findings

The study highlights several pragmatic entrepreneurship education practices that significantly enhance the entrepreneurial mindset among chemistry undergraduates. Key practices identified include entrepreneurial internship programs, business incubation programs, practical applications and projects, a supportive regulatory environment, cross-disciplinary collaboration, and entrepreneurship competitions and workshops. Entrepreneurial internship programs provide essential hands-on experience, which is crucial for developing entrepreneurial skills and attitudes. Practical projects, with the highest mean score, underscore the importance of applying theoretical knowledge in real-world contexts, thus enhancing students' practical skills and entrepreneurial

thinking. The finding is in line with Allahar and Brathwaite (2016) and Jamil et al (2016) that business incubation programs offer vital support and resources, facilitating the testing and development of business ideas. This is also in line with Zreen et al (2019) on the role of internship and business incubation programs in forming entrepreneurial intentions, which revealed that creating a supportive regulatory environment within universities, which reduces bureaucratic hurdles and provides financial access, is crucial for fostering entrepreneurial initiatives. In addition, the study is in line with Sperber and Linder (2019) on gender-specifics in start-up strategies and the role of the entrepreneurial ecosystem revealed that facilitating collaboration between chemistry students and peers from other disciplines, such as business or engineering, leads to innovative ventures by combining diverse skills and perspectives. Entrepreneurship competitions and workshops further stimulate creativity and entrepreneurial spirit among students (Suleiman, 2010).

Moreover, the study identifies several key factors influencing the entrepreneurial intentions of chemistry undergraduates. Personal skills such as creativity, problem-solving abilities, and resilience play a significant role, with the highest mean score among the influencing factors (Al-Mamun et al., 2015; Boateng, 2019). The availability of financial resources and infrastructural support is also critical, emphasizing the need for adequate financial and infrastructural backing for entrepreneurial ventures (Javed et al., 2018; Bienkowska et al., 2016). A supportive educational environment offering training, counseling, and mentorship is essential for nurturing students' entrepreneurial aspirations (Nowiński et al., 2019; Yarima & Hashim, 2016). Exposure to successful entrepreneurial role models and mentors inspires students to consider entrepreneurship as a viable career path (Zreen et al., 2019). Structured entrepreneurship education programs, including workshops, seminars, and courses, effectively enhance students' entrepreneurial intentions (Suhaimi, Al Mamun, Zainol & Nawi, 2018).

Conclusion

Incorporating these pragmatic entrepreneurship educational approaches into the chemistry curriculum can substantially foster entrepreneurial mindsets among undergraduates. By addressing aspects such as personal competencies, financial backing, conducive educational settings, mentorship, and structured educational schemes, the chasm between academic curricula and labor market requisites can be bridged, potentially alleviating the prevalent high rates of graduate unemployment.

Recommendations

Drawing from the study's outcomes, the ensuing recommendations were proposed;

1. Universities ought to engage in partnerships with industries to provide internship openings where students can apply theoretical knowledge to real-world business contexts. Additionally, tertiary institutions should establish incubation hubs to offer mentorship, financial support, and workspaces for student-led ventures.
2. Academic institutions should streamline administrative procedures and facilitate enhanced access to financial resources for student entrepreneurs, while also encouraging interdisciplinary ventures and endeavors that promote collaboration between chemistry scholars and peers from business or engineering faculties.

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