

Basic Employability Skills of Final-Year Undergraduate Science and Economics Education Students of a University in Nigeria

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Abstract

The employers of labour often express concerns that graduates lack the essential skills required to meet the demands of contemporary jobs. The study, therefore, examines the fundamental employability skills that Science and Economics Education students possess. A mixed-methods design involving quantitative and qualitative data collection processes was employed using a sample of 185 final-year students of science and economics education. Two instruments used for the study were a rating scale and an interview. A reliability index of 0.828 was achieved through Cronbach's Alpha for the rating scale. The quantitative data were analyzed using descriptive methods, while thematic analysis was employed for the qualitative data. The findings of the study showed that the students possessed teamwork/collaboration, critical thinking, creativity, and decision-making skills. The findings suggest that teachers should encourage the development of these skills during instruction by assigning tasks that challenge students, fostering teamwork, and promoting critical and creative thinking.

Keywords: Basic, 21st century, employability skills, undergraduate, and science education

Introduction

One of the most pressing socio-economic problems facing Nigeria and many developing economies is graduate unemployment. Despite the annual increase in university enrolment, the labour market has failed to absorb the increasing number of graduates into the workforce. Di Battista et al. (2023), reporting from the World Economic Forum, noted that graduate unemployment and underemployment are on the rise, which reflects the structural weaknesses in the economy and a misalignment between labour market demands and higher education outputs. There is a concern regarding the capacity of higher institutions to produce graduates who possess the employability skills necessary for the job market.

Higher education plays a vital role in driving economic growth and human capital development. Higher education is essential in preparing young individuals for the workforce. Universities are regarded as essential instruments in the advancement of human capital. Given this, the significance of university education in enhancing the employability of youth is paramount (Weligamage, 2011). Sanusi (2002) observed that although higher education paves the path to rewarding employment and a satisfactory quality of life, the connection between

education and job opportunities is influenced by how well educational qualifications align with labor market demands, as well as the degree to which education can adjust to the evolving economic landscape.

Research suggests that the adverse experiences encountered by unemployed university graduates stem from a disconnect between labor market requirements and graduates' expectations, as well as a lack of essential employability skills among these individuals (Egulu, 2014). Bassey (2018) emphasizes that the ongoing unemployment crisis among graduates of tertiary education institutions in Nigeria underscores the widening gap between university programs and the realities of the job market. Dabalén, et al. (2001) noted that the skill sets of graduates have not kept pace with economic needs, resulting in a bleak employment outlook for Nigerian graduates, a trend that is likely to worsen over time. A major challenge for higher education in Nigeria is the imperative to effectively cultivate and produce graduates who meet labor market expectations. As Ogu (2010) suggests, higher education must tailor its curricula to align with market demands relevant to specific contexts and

periods while also promoting comprehensive human development. The solution appears to involve integrating employability skills into the curriculum. In the context of this study, science education and economics education play a crucial role in graduate employability. While science education is fundamental to the development of a nation, economics education equips students with skills such as analytical reasoning, decision-making skills, and an understanding of the economic system that influence employability, resource allocation, and productivity. Research (Marginson, 2022; Mishchuk et al., 2024) suggests that graduates who possess both scientific knowledge and economic reasoning skills are well-positioned to navigate complex labour markets and adapt to the demands of the workplace, which contributes to sustainable economic development. However, Olanipekun et al. (2021) found that science education graduates do not possess the practical and transferable skills required to translate academic knowledge into the productive knowledge needed in the workplace for effective performance, a situation also applicable to economics education students.

Employability can be defined as the capacity of a graduate to obtain and progress in employment through an effective deployment of skills, knowledge, and some personal attributes (Adewolu, 2024; Okolie et al., 2020). Employability skills such as problem-solving and analytical skills are also relevant to science and economics education students who will be employed to evaluate alternatives, respond rationally to economic challenges, and allocate scarce resources efficiently. Despite the importance of possessing these critical skills, studies (Olanipekun et al., 2021; Abdulrazaq & Lambe, 2024) in Nigeria report that university undergraduates often exhibit shortcomings in the core employability skills. Indeed, Nigeria has experienced a significant rise in unemployment, particularly among university graduates. Each year, many graduates enter the job market, yet there are insufficient jobs to accommodate them. The employment situation in Nigeria is worsening. In 2016, the unemployment rate stood at 14.23 percent, increasing to 20.42 percent in 2017, 23.13 percent in 2018, 27.10 percent in 2019, and 33.28 percent in 2020 (National Bureau of Statistics, 2020). Every year, about 1.8 million students graduate from Nigerian universities without corresponding employment in the labor market to absorb them (National Bureau of Statistics, 2020).

The challenges and constraints of access to quality education and skills training for the younger generation in the 21st century have grown

increasingly over the years. Quality education and training enhance the productivity of young people, thereby creating better chances to secure decent jobs in the labor market. Most of the youths affected by the present situation in Nigeria include school dropouts, youths from rural areas, child labourers due to poverty, females who are deprived of attaining education due to social factors, and even graduates of science education who are ill-equipped, and many more. Enhanced training leads to increased earnings, which in turn elevate the quality of life, promote workplace safety, foster diversity, and support the well-being of individuals. The labor market worldwide is demanding individuals with both technical and employability skills for them to effectively function and become more relevant and successful (Bancino & Zevalkink, 2017).

Zinser (2003) identifies employability skills as encompassing teamwork and collaboration, decision-making, creativity, and critical thinking abilities. Collaboration and teamwork abilities refer to the process by which individuals work collectively as a group, facilitating the sharing of ideas, reaching agreements, and attaining optimal outcomes in problem-solving scenarios. Critical thinking skills refer to the process of analyzing, breaking down, and evaluating issues before concluding. Critical thinking can be fundamentally defined as the use of cognitive abilities or techniques designed to increase the probability of attaining positive outcomes. Additionally, it encompasses the assessment of reasoning and the various factors involved in decision-making. As noted by Paul and Elder (2016), a proficient critical thinker addresses complex problems by posing essential questions, collecting pertinent information, drawing conclusions, and communicating effectively.

Creativity skills: Creativity is a cognitive process that involves generating new ideas or establishing connections between existing ideas. It involves the ability to combine ideas in unique ways or to form unconventional associations (Schaper et al., 2011). This skill draws upon both imagination and expertise to produce original works or artistic expressions. Creativity is a trait of constructive originality, often manifested in the ability to discover new solutions to problems or to investigate novel forms of artistic expression. An idea is deemed creative if it is novel, original, useful, adaptive, functional, and surprising (Runco, 2007b). Creative individuals are typically motivated by challenging circumstances and driven by curiosity, leading to the development of fresh and innovative ideas. They also possess an intrinsic motivation to explore and cultivate new concepts.

Although previous studies (Jimoh, 2022; Okolie et al., 2020; Orji, 2013; Uchendu, 2015; and Oluwakemi, 2017) have examined graduate employability in Nigeria, there appears to be a lack of empirical evidence focusing specifically on final-year undergraduate Science and Economics Education students in terms of employability skills that intersect economic reasoning and decision-making competencies. Moreso, current studies have focused more on generic graduate unemployment and enhancing graduate job stability, leaving a gap in the basic employability skills required for undergraduate students.

It is against this backdrop that this study investigates the basic employability skills of final-year undergraduate students in science and economics education. This study, therefore, aims to analyse the:

1. teamwork/collaboration skills possessed by science and economics education students.
2. creativity skills possessed by science and economics education students.
3. critical thinking skills possessed by science and economics education students.
4. decision-making skills possessed by science and economics education students.

Theoretical Framework

A framework relevant to this study is Fundamental Life Skills by the World Health Organization (WHO, 2019). The framework identified essential life skills, including decision-making, problem-solving, creativity, critical thinking, communication, interpersonal abilities, self-awareness, empathy, and the capacity to manage emotions and stress (WHO, 2019). This framework is related to this study through its emphasis on decision-making, creativity, and critical thinking skills, which were the skills investigated in this study. Another framework the study is related to is Partnership for 21st Century Skills (P21) (2009), which categorized 21st century skills into learning skills, which are creativity, critical thinking, collaboration, and communication skills; life-long skills which include flexibility, initiative, social, productivity, and leadership skills, while literacy skills are information, media, and technology literacy skills. This framework is related to the study's collaboration/teamwork, which the present study also investigated.

Method and Materials

A descriptive survey research design was adopted for this study. Nworgu (2015) noted that descriptive survey research design is a purpose-based category of survey research that aims to

collect data and describe sequentially and systematically the attributes of a specific population. This study was conducted at the University of Nigeria, Nsukka (UNN), specifically the Department of Science Education (UNN) and Economic Education. These departments were deemed suitable for this study, because they are responsible for producing students who will become future educators and teachers, indicating that the future of science and economic teaching depends largely on them. Final-year students were used because it is believed that, being in their final year of school, they may have acquired the requisite skills that will make them gainfully employed upon graduation.

The study population consists of 185 final-year students from the Science and Economics Education Departments at the University of Nigeria for the 2021/2022 academic session. The population was obtained through their class lists from the two Departments. The sample for this study consisted of 185 final-year students from the Science and Economics Education Department of the University of Nigeria, Nsukka, which was the total population of the study.

Two Instruments were used for data collection, namely the Students' Acquisition of 21st Century Employability Skills Scale (SACESS) and the Interview Guide. This scale was structured to enable the researchers to elicit information from the respondents. The instrument was developed by the researchers after an extensive literature review. It had two sections (A and B). Section A comprised the biodata of the respondents. Section B consisted of four clusters (A-D) that addressed teamwork/collaboration, critical thinking, creativity, and decision-making skills of the students, respectively. All the clusters were structured on a four-point scale of Excellent (4), Very Well (3), Somehow Well (2), and Just a Little (1). The second instrument, an interview guide, contained five unstructured questions for the interviewees to respond to. The questions were simple yet complex, as students must reason before responding.

The research instruments were validated by three validators, all of whom are from the Department of Science and Economics Education. Their comments, suggestions, and corrections contributed to the development of the final draft of the instrument. The reliability of the instrument was ascertained through trial-testing of the instrument on a sample (20) outside the study sample but sharing the same or similar characteristics with the study sample. The reliability coefficient was determined using Cronbach's Alpha because the instrument had

polytomously scored items. The reliability coefficients for clusters A, B, C, and D were 0.79, 0.97, 0.69, and 0.86, respectively. An overall reliability coefficient of 0.83 was obtained.

To ensure that the obtained data were ethically compliant, a pseudonym approach was used to identify the students, and confidentiality was assured to the participants. Additionally, verbal and written consents were sought and obtained from the participants. The scale was administered on a one-to-one basis and collected immediately. A smaller

number of the students were interviewed, numbering 10 final-year students. A Mixed-methods (quantitative and qualitative) data analysis was adopted. The quantitative data were analysed using the mean and standard deviation, given the nature of the scale, which is an interval scale ranging from 4 to 1. A mean of 2.50 was used as the criterion level of possessed or below for unpossessed mean responses. The qualitative data were analysed thematically in line with the major research questions that guided the study.

Results

Table 1: Mean and standard deviation of respondents on the teamwork/collaboration skills possessed by science and economics education students

S/N	Item Statement	Mean	SD	Remark
1	Ideas from science education help me collaborate with others	3.34	.91	Possessed
2	I collaborate effectively with fellow students	3.21	.68	Possessed
3	I place much value on respect for others in working together	3.17	.91	Possessed
4	I can lead a team during physics practical	3.17	.82	Possessed
5	I coach, give feedback when appropriate to raise the performance of others,	3.19	.77	Possessed
6	I make decisions with others	3.14	.94	Possessed
7	I work with people of different ages	3.09	.94	Possessed
8	I value the perspectives of my fellow group members.	3.04	.83	Possessed
9	I identify the weaknesses of team members	3.08	.99	Possessed
10	I steer clear of engaging in disputes.	2.85	.92	Possessed
11	I prefer to contemplate matters thoroughly before taking action	3.01	.84	Possessed
12	I exercise caution to avoid making hasty judgments.	2.96	.80	Possessed
13	I enhance the ideas of others to facilitate their improvement.	2.77	.92	Possessed

The results in Table I revealed the teamwork/collaboration skills possessed by science and economics education students. From the Table, items 1-13 had mean values ranging from 2.77-3.34. These values were above the 2.50 mean value set for the decision rule. The result, therefore, implies that all

the items in Table 1 are the teamwork/collaboration skills possessed by science and economics education students. The standard deviation of the 13 items ranged from 0.77–0.99, indicating that the respondents were homogeneous in their responses.

Table 2: Mean and standard deviation of respondents on the critical thinking skills possessed by science and economics education students

S/N	Item Statement	Mean	SD	Remark
1	Challenges in the field of science enhance my ability to think critically.	3.38	.83	Possessed
2	When faced with an issue, I can engage in critical thinking.	3.10	.80	Possessed
3	I am capable of identifying issues within a matter.	3.15	.75	Possessed
4	I am capable of making a precise assessment regarding the issue.	2.94	.82	Possessed
5	I can identify the inconsistency between the rationale and the outcome based on the provided explanations concerning the issue.	2.92	.86	Possessed
6	By providing explanations about a subject, I can create significant connections related to that subject.	2.98	.89	Possessed
7	Through my reflections, I can provide insights into various issues.	3.00	.82	Possessed
8	As a topic is being discussed, I can focus on it alongside my reflections.	2.96	.92	Possessed
9	By providing explanations on a subject, I am able to anticipate the underlying ideas that have not been articulated.	2.88	.96	Possessed
10	When I come across an issue, I assess whether the topic is based on direct experience or not.	3.01	.91	Possessed
11	When I face an issue, I can articulate my opinions about it.	2.85	.91	Possessed

The results in Table 2 reveal the critical thinking skills possessed by students in science and economics education. From the Table, items 1-11 had mean values ranging from 2.85-3.38. These values were above the 2.50 mean value set for the decision rule. The result, therefore, indicates that all the items

in Table 2 are the critical thinking skills possessed by science education students. The standard deviation of the 11 items ranged from 0.75–0.96, indicating that the respondents were homogeneous in their responses.

Table 3: Mean and standard deviation of respondents on the creativity skills possessed by science and economics education students

S/N	Item Statement	Mean	SD	Remark
1	When I encounter a problem, I am always creative	3.32	1.02	Possessed
2	I originate new ideas	2.96	.65	Possessed
3	I practice being creative	2.72	1.01	Possessed
4	I work with others to be creative	2.96	.90	Possessed
5	I find that my creativity flourishes most effectively when I am working under deadlines.	3.04	.95	Possessed
6	Isolating myself from others makes me creative	2.81	.96	Possessed
7	I do a lot of experimentation before coming up with new ideas	2.90	1.03	Possessed
8	I originate new methods while working with others	2.82	.86	Possessed
9	I originate new products while working with others	2.95	.81	Possessed
10	Meditation helps me to be creative	2.84	.92	Possessed
11	I take pleasure in the journey of generating new concepts, regardless of whether they culminate in a finished product.	2.88	.99	Possessed
12	My creativity flourishes most when I collaborate with others.	3.12	.87	Possessed

The results in Table 3 revealed the creativity skills possessed by students in science and economics education. From the Table, items 1-12 had mean

values ranging from 2.72-3.32. These values were above the 2.50 mean value set for the decision rule. The result, therefore, implies that all the items in

Table 3 are the creativity skills possessed by science education students. The standard deviation of the 12 items ranged from 0.65–1.02, indicating that the respondents were homogeneous in their responses.

Table 4: Mean and standard deviation of respondents on the decision-making skills possessed by science and economics education students

S/N	Item Statement	Mean	SD	Remark
1	Group ideas help me make decisions	3.17	.79	Possessed
2	I make decisions quickly	2.74	.84	Possessed
3	I gather a lot of information on any new opportunity that arises before deciding	2.98	.79	Possessed
4	I take my time over most decisions I make	2.97	.97	Possessed
5	I feel relaxed in situations where I am under pressure to make a quick decision	2.91	.86	Possessed
6	I devote a lot of time to fully evaluating options before making important decisions	2.74	.99	Possessed
7	I arrive at conclusions without fully contemplating all the consequences.	2.72	.97	Possessed
8	I form my opinions independently of others' perspectives.	2.86	1.03	Possessed
9	I change my mind about things when they get tough	2.81	.91	Possessed
10	In making decisions, I prefer practicality more important than principles	2.75	1.02	Possessed
11	I stick by my decisions, come what may	2.52	1.08	Possessed

The results in Table 4 revealed the decision-making skills possessed by students in science and economics education. From the Table, items 1-11 had mean values ranging from 2.52 to 3.17. These values were above the 2.50 mean value set for the decision rule. The result, therefore, indicates that all the items in Table 4 are the decision-making skills possessed by science education students. The standard deviation of the 11 items ranged from 0.79–1.08, indicating that the respondents were homogeneous in their responses.

Qualitative Data Analysis

Theme 1: Teamwork/Collaboration

A question was asked of the interviewees. Do you prefer working alone (on assignment or class work) to working with a group? If yes, why; if no, why. Many of the students (90%) responded that they prefer working together with their schoolmates to working alone. They said that their reasons are that working together makes the assignment/class work a lot easier since ideas come from each member of the group. Moreover, the respondents stated that another reason why working together as a group is better is that each member collaborates on the assignment collectively, saving time and energy. The assignment can also be shared, making the work much faster to finish.

Only one of the students said I don't like working in a group because

“Most times, many of them rely on me to get the work done and, in turn, share in the mark.”

Theme 2: Critical Thinking Skills

An important question was posed to the students interviewed:

Would you be regarded as a critical thinker? If yes, how do you know?

In this question, many students (80%) proudly responded yes, with their reasons being that they think and reason well on any matter before them. They do not follow a conventional approach in addressing matters before them, such as confronting them immediately; instead, they logically ponder to deduce the solution (s) or an answer to the matter. They alluded that their approach to thinking starts from what they know, then moves to what they didn't know, from simple to complex.

It was only two students who answered no, with their reasons being that they didn't want anything that would disturb them or make them feel uneasy.

Theme 3: Creativity Skill

The students were asked this question:

When confronted with a problem to solve, how do you go about it? Using the teacher's taught solution or devising your own?

The students (all) highlighted that they often begin with the one taught by their teacher before devising another solution. However, 60% said that they like trying alternative solutions, understanding that there are numerous ways to solve a problem. These

alternative ways help them put the status quo to the test, they said.

Theme 4: Decision-Taking Skill

A question raised was:

When confronted with real-life challenges that require you to decide, what will be your first approach?

The students said that they will first and foremost understand the challenge/problem, understanding it from different perspectives by asking relevant questions and embarking in a thorough investigation before making the decision. In this way, they will be sure that they are on the right track. All the students, without exception, shared these views.

Discussion

The findings revealed that Science and Economics Education students possessed teamwork/collaboration skills. This is because these students, while in school, are given group assignments, engage in group discussions while preparing for their examinations, and work in groups while performing experiments during practical sessions. The students offered some entrepreneurship courses, such as CEDR 341 and CEDR 342, in their third year, in which teamwork skills were discussed. The significance of teamwork skills was recognized due to the necessity of exchanging ideas and knowledge among students, the enhancement of communication abilities, and the genuine learning environment fostered by collaborative activities. A similar study conducted by Robinson and Bryan (2008) shows that all respondents perceived the importance of employability skills to be moderately important for training college of agriculture graduates in the workplace. Brookes (2017) also revealed that a significant number of academics recognize the significance of teamwork skills for undergraduate students in the sciences. This aligns with previous research, which indicates that both science graduates and their employers feel that teamwork skills require further enhancement (Prinsley & Baranyai, 2015; Sarkar et al., 2016). To guarantee that science students graduate with sufficient teamwork competencies, it is essential to examine the science curriculum, evaluation methods, and teaching strategies more thoroughly.

The findings also revealed that the students possess critical thinking skills. This could be because the students are going through applied questions during their examinations. The students are usually assigned topics to research, write about, and present, which encourages them to think critically. A

comparable investigation was carried out by Adeyemi (2008), who found that critical thinking is essential for individual achievement, national harmony, advancement, and development.

The findings revealed that Science and Economics Education students possessed creativity skills. This is because these students are being given several projects to design, which helps them to be creative. The students are given opportunities to originate new ideas while conducting experiments. Also, the students are allowed to present various projects. For example, physics students constructed a solar panel, chemistry students produced liquid soaps, mathematics students constructed an abacus, and economics students formulated microeconomic models for small businesses. This science exhibition helped the students become creative. In this study, a similar study was conducted by Mbanefo and Eboka (2017), who show that a significant demand for innovative and entrepreneurial skills exists within basic science education to facilitate job creation. Educators need to implement practical teaching methods for their students. However, various challenges hinder the development of entrepreneurial skills in basic science education aimed at job creation, including issues related to the curriculum, educators, and government policies.

The findings revealed that Science and Economics Education students possessed decision-making skills. This is a result of the fact that students are given the opportunity to gather a lot of information, which will help them in any new opportunity that arises, allowing them to make informed decisions and take adequate time to make most decisions. Take, for instance, a group discussion: these students always devote a lot of time to fully evaluating options before making important decisions.

Conclusion

Based on the study's findings and the ensuing discussions, it was concluded that the students possessed teamwork/collaboration, critical thinking, creativity, and decision-making skills. Thus, these students were taught with a program that has these skills.

Recommendations

Based on the findings of this study, it was recommended that lecturers of science and economics education should strive to promote high levels of critical skills, creativity, teamwork/collaboration, and decision-making skills by giving students tasks, projects, and assignments that will make them think



critically, create something novel, make tough decisions, and collaborate.

Limitations of the Findings of the Study

One limitation of the findings is the use of a self-rate scale in which students rated their possession of the skills investigated. This may have introduced bias from the students. Given this, the students were further interviewed to relate their self-reports to the qualitative data obtained. Given this limitation, it is worth noting that the critical thinking and creativity assessed using this instrument suggest perceived critical thinking and creativity. Another limitation is the small sample used for the study. Again, the study employed only science and economics education students, making its generalization to other students nearly impossible.

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Declaration of Conflicting Interest

There is no conflicting interest in this paper

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Data Availability Statement

The data can be obtained from the university's academic planning, where the study was conducted.

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