



Innovative Food Processing and Entrepreneurial Skills as Catalysts for Workforce Readiness among Business Education Graduates in the 21st Century Competitive Market

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Abstract

This study examined innovative food-processing and entrepreneurial skills as catalysts for workforce readiness among Business Education students in the 21st century competitive market. The study adopted a correlational survey research design. The population comprised 54 Business Education students at the University of Calabar, and the entire population was studied using the census sampling technique. Data were collected using a structured questionnaire titled Innovative Food Processing, Entrepreneurial Skills and Workforce Readiness Questionnaire (IFPESWRQ). The instrument was structured on a four-point rating scale. Mean and standard deviation were used to answer the research questions, while regression analysis was employed to test the null hypotheses at the 0.05 level of significance. The findings revealed that innovative food-processing skills were possessed by the students to a high extent, with a grand mean of 3.00. However, innovative food-processing skills did not significantly predict workforce readiness ($R = 0.183$, $R^2 = 0.033$, $\beta = 0.183$, $t = 1.340$, $p = 0.186$). Entrepreneurial skills were also possessed to a high extent, with a grand mean of 3.01, and significantly predicted workforce readiness ($R = 0.342$, $R^2 = 0.117$, $\beta = 0.342$, $t = 2.628$, $p = 0.011$). The study concluded that although innovative food-processing skills provide useful technical competencies, entrepreneurial skills have a significant role in enhancing workforce readiness among Business Education students. The study recommended stronger integration of practical entrepreneurship, food-processing competencies and broader employability skills into Business Education programmes, together with increased experiential learning and university-industry collaboration.

Keywords: Innovative Food Processing; Entrepreneurial Skills; Workforce Readiness; Business Education; Food Technology; Employability

Introduction

The food sector plays an important role in economic development, employment creation, income generation and food security, particularly in developing economies where agriculture provides abundant raw materials for value addition. One of the major ways of converting agricultural resources into economic value is through food processing, which transforms raw materials into products with improved shelf life, convenience, quality and market value. Beyond reducing post-harvest losses, food processing creates opportunities for small and medium-scale enterprises, entrepreneurship and local economic development. The Food and Agriculture Organization (FAO) and the United Nations Industrial Development Organization (UNIDO) have emphasised the importance of agro-industrialisation and value addition in promoting income generation, productive investment and employment, while recognising skilled labour as an important component of competitive agro-industrial development [1]. Against this background, the acquisition of innovative food-processing skills is increasingly relevant to individuals seeking to participate productively in food-related enterprises and the wider labour market.

The growing importance of such skills is closely associated with changes in the nature of the contemporary workplace. The 21st century market environment is characterised by rapid



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technological advancement, changing consumer preferences, global competition, innovation and entrepreneurship. These developments have increased the demand for workers who can adapt to changing circumstances, apply knowledge practically, solve problems and respond creatively to emerging opportunities. Consequently, academic qualifications alone may not adequately prepare graduates for effective participation in the labour market. The International Labour Organization (ILO) observed that young people may face disadvantages in securing employment when they lack core employability skills, particularly because first-time job seekers often compete with more experienced workers [2]. The ILO further reported that interventions which combine skills development, entrepreneurship and other employability components can improve labour-market outcomes for young people, particularly in low- and middle-income countries [3]. This situation places greater responsibility on higher education institutions to produce graduates who can not only demonstrate academic knowledge but also apply that knowledge in practical, occupational and entrepreneurial settings.

The need for such a skills-oriented approach is particularly important in Nigeria, where graduate employment and entrepreneurship remain significant socioeconomic concerns. Evidence from studies on Nigerian graduates indicates that barriers to employment and entrepreneurship are associated not only with limited employment opportunities but also with gaps in practical, technical and entrepreneurial competencies [4]. This has increased the need for educational programmes that connect theoretical learning with practical skills, entrepreneurship and labour-market requirements. The Nigerian Youth Employment Action Plan similarly identifies employability and entrepreneurship as important areas of intervention for improving youth employment outcomes [5]. Thus, preparing graduates for the contemporary economy requires educational experiences that enable them to acquire competencies that can be transferred directly into employment, self-employment and enterprise development.

Within this context, Business Education occupies an important position because of its emphasis on business knowledge, occupational skills, entrepreneurship and competencies required for effective participation in the world of work. Business Education is expected to prepare graduates who can function in different occupational capacities, establish and manage enterprises, and contribute to economic development. However, the changing nature of work has raised questions about whether existing Business Education programmes are adequately aligned with the competencies required in contemporary workplaces. For instance, research conducted in Lagos State reported that Business Education programme content did not adequately equip students with some of the soft skills required in the work environment and recommended stronger alignment between curriculum content and workplace expectations [6]. Similarly, research in Rivers State identified sales and marketing, financial management, communication, leadership, problem-solving, information and communication technology, time management and related competencies as important employability skills for Business Education graduates [7]. These findings suggest that Business Education must continue to evolve by incorporating practical and market-responsive competencies alongside conventional business knowledge.

One area of competency that is particularly relevant to this evolving

role of Business Education is entrepreneurship. Entrepreneurial skills enable individuals to identify opportunities, generate and develop business ideas, mobilise resources, manage enterprises, respond to risks and adapt to changing market conditions. For graduates facing an increasingly competitive labour market, these competencies can support both employment and self-employment. Evidence from Nigeria supports this position. Research among Business Education graduates in Cross River State identified planning, marketing and management skills as important entrepreneurial competencies associated with graduates' employability [8]. Similarly, a study of Business Education graduates in Rivers State highlighted the importance of competencies such as accounting, public relations, information and communication technology, and office technology management for establishing and managing small and medium-scale businesses [9]. These findings indicate that entrepreneurship in Business Education should extend beyond theoretical understanding to the development of practical competencies that graduates can apply in actual economic settings.

While entrepreneurial skills provide the capacity to identify and exploit opportunities, the nature of the opportunity itself also matters. In this regard, food processing represents a potentially useful area through which Business Education graduates can apply their business and entrepreneurial knowledge. Food processing encompasses activities such as preservation, drying, milling, packaging, product formulation, quality control, storage and other forms of value addition. These activities can transform agricultural raw materials into commercially viable products while creating opportunities for income generation, enterprise development and local employment. However, successful participation in food-processing enterprises requires more than technical knowledge of processing procedures. It also requires the ability to identify market opportunities, develop products, determine costs and prices, package products appropriately, market goods, manage finances, maintain customer relationships and plan business activities. Therefore, combining innovative food-processing skills with entrepreneurial competencies could provide Business Education students and graduates with a broader foundation for participating in the competitive market.

The importance of combining technical and entrepreneurial competencies is supported by evidence from food-processing education. A study of agro-food processing graduates in Ethiopia found that trainer competence, trainee characteristics, training quality and cooperative training were important factors associated with graduate competence, while inadequate training resources and weak industry collaboration constrained competency development [10]. Similarly, research on collaboration between academia and the food industry indicated that industry-linked courses and internships can strengthen professional skills and employability by exposing learners to practical workplace experiences [11]. These findings demonstrate that the effectiveness of food-processing education depends not only on what students learn but also on the extent to which learning is connected to practical workplace and industry experiences. For Business Education students, such experiences could provide an opportunity to connect their business knowledge with practical food-sector activities.

The relevance of innovative food-processing skills is further strengthened by changes in consumer behaviour and competition within the food market. Consumers increasingly demand food products that offer convenience, safety, quality, nutritional value,

attractive packaging and adequate shelf life. Food producers and entrepreneurs therefore need to continuously improve products and processing methods in order to respond to these expectations. Innovation in food processing may involve improved processing techniques, efficient utilisation of raw materials, product diversification, appropriate packaging, quality improvement, waste reduction and the application of technology in production and marketing. For Business Education students, exposure to these competencies can provide a practical avenue for combining business knowledge with technical capabilities and may create opportunities for enterprise development in food-related activities.

The relevance of these competencies becomes clearer when considered alongside the concept of workforce readiness. Workforce readiness refers broadly to the combination of knowledge, technical competencies, transferable skills, attitudes and capabilities that enable individuals to enter the workplace, perform effectively and adapt to changing occupational demands. The ILO emphasises the importance of connecting education and training with labour-market requirements through technical and vocational competencies, employability skills and work-based learning [2]. In the Nigerian context, recent evidence has also highlighted the relevance of practical entrepreneurial competencies to the employability of Business Education graduates [12]. Workforce readiness, therefore, extends beyond possession of a university qualification. It involves the ability to translate acquired knowledge and skills into productive workplace performance, self-employment, enterprise development and adaptation to changing economic conditions.

The empirical literature on innovative food-processing skills provides further support for the importance of practical and transferable competencies in preparing graduates for employment. Gebremeskel [13], Bohlscheid and Clark [14], Metcalfe *et al.*, [15], Weston *et al.*, [16] and van Berkum *et al.*, [17] generally reported the importance of practical training, technical knowledge, industry exposure, critical thinking, problem-solving and related competencies in preparing graduates for workplace demands in food science and technology. Manalo and Sisnorio [18] similarly showed that adaptive and contextual competencies were relevant to the workplace performance of Food Technology graduates. Collectively, these studies suggest that food-processing education can contribute to the development of competencies required for effective workplace participation. However, most of the studies focused on students or graduates of Food Science, Food Technology and technical and vocational education programmes rather than Business Education. This leaves an important contextual question concerning the relevance of such skills among Business Education students and graduates.

The literature on entrepreneurial skills provides a complementary perspective. Eze *et al.*, [19] found that accounting, office technology and management, and marketing skills were important for self-employment among Business Education graduates. Akeke *et al.*, [20] established that planning, marketing and business management skills were relevant to the employability of Business Education graduates in Cross River State. Ezeonwurie's [21] study similarly reported the importance of entrepreneurship skills in enhancing the employability of Business Education graduates, while Manyahaya and Mohammed [22] linked entrepreneurship skills acquisition with employability proficiency. Oluwalola [23-27] also established the relevance of entrepreneurial skill acquisition to employment generation among Business Education graduates. These findings consistently point to

the contribution of entrepreneurial competencies to graduates' ability to participate in employment and enterprise activities.

Although the existing literature provides evidence on food-processing competencies and entrepreneurial skills separately, the relationship between these competencies and workforce readiness among Business Education students remains insufficiently examined. Existing Nigerian studies have largely focused on entrepreneurial competencies, general employability skills, digital competencies or the effectiveness of Business Education programmes as separate areas of investigation [6-9, 12]. Similarly, much of the literature on innovative food-processing competencies has focused on students and graduates in Food Science, Food Technology and TVET programmes [13-18]. Consequently, there is limited empirical evidence on whether innovative food-processing skills, alongside entrepreneurial skills, contribute to workforce readiness within the specific context of Business Education.

This gap is important because Business Education combines business knowledge with occupational and entrepreneurial preparation. Students in the programme may therefore benefit from competencies that enable them not only to seek conventional employment but also to identify opportunities, create value-added products, establish enterprises and respond to changing market conditions. Examining innovative food-processing skills alongside entrepreneurial skills can consequently provide a broader understanding of the competencies that may be relevant to workforce readiness among Business Education students. Such an approach also recognises that workforce readiness is multidimensional and may depend on the interaction of technical, entrepreneurial and transferable competencies rather than on academic qualifications alone.

It is against this background that the present study examines Innovative Food Processing and Entrepreneurial Skills as Catalysts for Workforce Readiness among Business Education Graduates in the 21st Century Competitive Market. The study seeks to provide empirical evidence on the extent to which innovative food-processing and entrepreneurial skills are associated with workforce readiness. Specifically, the study is concerned with whether practical competencies in food processing, when complemented by entrepreneurial capabilities, can equip Business Education students with skills relevant to employment, self-employment and enterprise development. The study is expected to contribute to the continuing discourse on skills-oriented Business Education, food-sector entrepreneurship and graduate workforce readiness, while providing evidence that may inform curriculum development, teaching practices and industry-oriented training in contemporary higher education.

Statement of the Problem

The 21st century labour market is changing rapidly as a result of technological advancement, changing consumer needs, innovation, global competition and the increasing demand for workers who can do more than possess academic qualifications. Employers increasingly require graduates who can apply knowledge practically, solve problems, demonstrate creativity, adapt to changing work environments and identify opportunities for self-employment. However, many graduates continue to experience difficulties in making a smooth transition from school to productive employment or sustainable entrepreneurship. This situation raises concerns about whether higher education programmes are adequately equipping graduates

with the practical and entrepreneurial competencies required in the contemporary market environment. Business Education is designed to prepare students for employment, entrepreneurship and effective participation in business and economic activities. Nevertheless, the possession of a Business Education qualification may not, by itself, guarantee workforce readiness where graduates have limited exposure to practical, innovative and market-oriented skills. Business Education graduates may possess knowledge of accounting, management, office technology, marketing and other business-related areas, yet still face challenges when required to translate such knowledge into practical economic activities. This creates a gap between what graduates learn in educational institutions and the competencies required to function effectively in an increasingly competitive labour market.

One area that could provide additional opportunities for Business Education graduates is food processing. Nigeria has abundant agricultural resources that can be transformed into value-added food products through appropriate processing, preservation, packaging and marketing. However, participation in this sector requires more than knowledge of food processing techniques. Graduates need to understand how to identify viable food products, improve existing products, manage production costs, package products attractively, maintain quality, market their products and respond to changing consumer preferences. Without these complementary entrepreneurial competencies, food-processing skills may not easily translate into viable employment or business opportunities. Another concern is that food processing is often viewed primarily from a technical or vocational perspective, while its entrepreneurial and business dimensions may receive less attention. For Business Education graduates, this presents a particular challenge because their business knowledge could be combined with innovative food-processing competencies to create opportunities for employment and enterprise development. However, there is insufficient empirical evidence on whether the combination of innovative food-processing skills and entrepreneurial skills actually contributes to the workforce readiness of Business Education graduates.

The problem, therefore, is not simply the absence of employment opportunities, but the extent to which graduates possess the practical, innovative and entrepreneurial competencies needed to recognise opportunities and respond effectively to the demands of the 21st century competitive market. If Business Education graduates are inadequately prepared in these areas, they may remain dependent on limited formal employment opportunities instead of becoming capable of creating value through employment, self-employment and entrepreneurship. It is against this background that the study seeks to examine innovative food processing and entrepreneurial skills as catalysts for workforce readiness among Business Education graduates in the 21st century competitive market. Specifically, the study is concerned with determining whether innovative food-processing skills and entrepreneurial skills can contribute meaningfully to graduates' preparedness to enter, adapt to and participate productively in the contemporary labour market.

Objectives of the Study

The study examined Innovative Food Processing and Entrepreneurial Skills as Catalysts for Workforce Readiness among Business Education Graduates in the 21st Century Competitive Market. Specifically, the study sought to:

1. Determine the extent to which innovative food-processing skills contribute to workforce readiness among Business Education

graduates in the 21st century competitive market.

2. Examine the extent to which entrepreneurial skills contribute to workforce readiness among Business Education graduates in the 21st century competitive market.

Research questions

The following research questions were formulated to guide the study:

1. To what extent do innovative food-processing skills contribute to workforce readiness among Business Education graduates in the 21st century competitive market?

2. To what extent do entrepreneurial skills contribute to workforce readiness among Business Education graduates in the 21st century competitive market?

Research hypotheses

The following null hypotheses are formulated and tested at the 0.05 level of significance:

H₀₁: Innovative food-processing skills do not significantly contribute to workforce readiness among Business Education graduates in the 21st century competitive market.

H₀₂: Entrepreneurial skills do not significantly contribute to workforce readiness among Business Education graduates in the 21st century competitive market.

Methodology

The study adopted a correlational survey research design. The design was considered appropriate because the study sought to determine the extent to which innovative food-processing skills and entrepreneurial skills were associated with workforce readiness among Business Education students at the University of Calabar. The study did not manipulate any of the variables; rather, data were obtained from the respondents based on their existing knowledge, skills and perceptions. The correlational design therefore provided an appropriate basis for examining the predictive relationships between innovative food-processing skills, entrepreneurial skills and workforce readiness in the 21st-century competitive market.

The population of the study comprised 54 Business Education students at the University of Calabar. The population was considered appropriate because Business Education provides students with practical, vocational, managerial and entrepreneurial competencies that are relevant to employment and self-employment. Given the relatively small and manageable size of the population, the entire population was included in the study using the census sampling technique. Thus, the sample size was 54 Business Education students. The use of the entire population ensured that all eligible students were represented and eliminated sampling error associated with selecting only a portion of the population. Data were collected using a structured questionnaire titled Innovative Food Processing, Entrepreneurial Skills and Workforce Readiness Questionnaire (IFPESWRQ). The instrument was developed by the researcher based on the objectives and research questions of the study, as well as relevant literature on innovative food processing, entrepreneurship and workforce readiness. The questionnaire consisted of sections covering the respondents' demographic characteristics, innovative food-processing skills, entrepreneurial skills and workforce readiness. The innovative food-processing and entrepreneurial skills sections each contained eight items, while the workforce-readiness section

Table 1: Mean and standard deviation of respondents' ratings on innovative food-processing skills.

S/N	Innovative Food-Processing Skills	Mean	SD	Decision
1	I can apply modern techniques to process agricultural raw materials into marketable food products.	3.04	0.93	Agree
2	I can develop new or improved food products from locally available agricultural materials.	2.94	0.9	Agree
3	I can apply appropriate food preservation techniques to improve the shelf life of processed food products.	3.13	0.89	Agree
4	I can select appropriate packaging methods that improve the quality and market appeal of processed food products.	2.91	0.92	Agree
5	I can use appropriate processing equipment and technology safely and effectively in food production.	3.13	0.93	Agree
6	I can identify and apply innovative methods for reducing waste during food processing.	2.98	0.94	Agree
7	I can apply appropriate quality-control practices to ensure that processed food products meet acceptable standards.	3.02	0.88	Agree
8	I can modify food-processing methods in response to changing consumer preferences and market demands.	2.89	0.9	Agree
	Grand Mean	3.00	0.91	Agree

Note: Criterion mean = 2.50

measured the dependent variable. The items were structured on a four-point rating scale of Strongly Agree (SA) = 4, Agree (A) = 3, Disagree (D) = 2 and Strongly Disagree (SD) = 1. The scale enabled the respondents to indicate their level of agreement with each statement.

The instrument was subjected to face and content validation by experts in Business Education, Food Science/Food Technology, and Measurement and Evaluation. The experts examined the items in terms of clarity, relevance, adequacy of coverage, appropriateness of language and alignment with the objectives and research questions. Their observations and suggestions were used to refine the instrument before its administration. The reliability of the instrument was established through a pilot test involving Business Education students who were not part of the study population. The responses obtained from the pilot test were analysed using Cronbach's alpha to determine the internal consistency of the instrument. Separate reliability coefficients were established for the innovative food-processing skills, entrepreneurial skills and workforce-readiness sections. A Cronbach's alpha coefficient of 0.70 or higher was considered adequate for determining the reliability of the instrument.

The researcher administered the questionnaire to the 54 Business Education students, with the assistance of trained research assistants where necessary. The purpose of the study was explained to the respondents, and they were encouraged to provide honest responses based on their knowledge and experiences. The completed questionnaires were collected, screened for completeness and prepared for statistical analysis. Participation was voluntary, and the information provided by the respondents was treated confidentially and used strictly for academic purposes. No personally identifying information was required, and responses were presented in aggregate form.

The data were coded and analysed using the Statistical Package for the Social Sciences (SPSS). Frequency, percentage, mean and standard deviation were used to summarise the demographic characteristics of the respondents and answer the research questions. A criterion mean of 2.50 was used in interpreting the responses, with mean scores of 2.50 and above indicating agreement and mean scores below 2.50 indicating disagreement. Multiple regression analysis was used to test the null hypotheses at the 0.05 level of significance. The regression analysis determined the extent to which innovative food-processing skills and entrepreneurial skills predicted workforce readiness among the respondents. A null hypothesis was rejected where the corresponding probability value was less than 0.05 and was not rejected where the probability value was greater than 0.05.

Results of the Findings

Research question one

To what extent do innovative food-processing skills contribute to workforce readiness among Business Education students at the University of Calabar?

The data presented in Table 1 show that all the eight items on innovative food-processing skills recorded mean scores above the criterion mean of 2.50. The mean scores ranged from 2.89 to 3.13, indicating that the respondents generally agreed that they possessed the identified innovative food-processing skills. The highest mean score of 3.13 was recorded for the ability to apply appropriate food preservation techniques to improve the shelf life of processed food products and the ability to use appropriate processing equipment and technology safely and effectively. The lowest mean score of 2.89 was recorded for the ability to modify food-processing methods in response to changing consumer preferences and market demands.

The grand mean of 3.00, which is above the criterion mean of 2.50, indicates that Business Education students at the University of Calabar generally agreed that innovative food-processing skills contribute to their workforce readiness. The overall standard deviation of 0.91 indicates a moderate variation in the respondents' ratings. Therefore, the answer to Research Question One is that innovative food-processing skills contribute to workforce readiness to a high extent among Business Education students at the University of Calabar.

Research question two

To what extent do entrepreneurial skills contribute to workforce readiness among Business Education students at the University of Calabar?

The data presented in Table 2 show that all eight items recorded mean scores above the criterion mean of 2.50. The mean scores ranged from 2.93 to 3.09, indicating general agreement among the respondents that they possess entrepreneurial skills relevant to workforce readiness. The highest mean score of 3.09 was obtained for the ability to develop effective marketing strategies for promoting processed food products. This was followed by the ability to develop a practical business plan, with a mean score of 3.04. The lowest mean score of 2.93 was recorded for the ability to take calculated risks when identifying and pursuing viable food-processing business opportunities. The grand mean of 3.01 is above the criterion mean of 2.50. This indicates that entrepreneurial skills contribute to workforce readiness to a high extent among Business Education students at the

Table 2: Mean and standard deviation of respondents' ratings on entrepreneurial skills.

S/N	Entrepreneurial Skills	Mean	SD	Decision
1	I can identify viable business opportunities in food processing and related enterprises.	3.02	0.84	Agree
2	I can develop a practical business plan for establishing and managing a food-processing enterprise.	3.04	0.85	Agree
3	I can determine the costs and appropriate selling prices of processed food products.	3.02	0.94	Agree
4	I can develop effective marketing strategies for promoting processed food products.	3.09	0.94	Agree
5	I can manage financial resources effectively when operating a small food-processing business.	2.98	0.9	Agree
6	I can identify and respond creatively to challenges encountered in running a food-processing enterprise.	3.02	0.92	Agree
7	I can take calculated risks when identifying and pursuing viable food-processing business opportunities.	2.93	0.91	Agree
8	I can use creativity and innovation to improve the competitiveness of a food-processing enterprise.	3.02	0.9	Agree
	Grand Mean	3.01	0.9	Agree

Note: Criterion mean = 2.50

Table 3: Regression analysis of innovative food-processing skills and workforce readiness.

Model	R	R ²	Adjusted R ²	Std. Error of Estimate	
1	0.183	0.033	0.015	0.614	
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	0.677	1	0.677	1.795	0.186
Residual	19.634	52	0.378	-	-
Total	20.311	53	-	-	-
Model	B	Std. Error	Beta (β)	t	Sig.
Constant	2.499	0.925	-	2.702	0.009
Innovative Food-Processing Skills	0.166	0.124	0.183	1.34	0.186

University of Calabar. Therefore, the answer to Research Question Two is that entrepreneurial skills contribute to workforce readiness to a high extent.

Test of hypotheses

Hypothesis one: H_{01} : Innovative food-processing skills do not significantly predict workforce readiness among Business Education students at the University of Calabar.

The result in Table 3 shows a correlation coefficient (R) of 0.183, indicating a weak positive relationship between innovative food-processing skills and workforce readiness. The coefficient of determination (R^2) is 0.033, indicating that innovative food-processing skills explain 3.3% of the variation in workforce readiness among the respondents. The adjusted R^2 is 0.015, while the standard error of the estimate is 0.614. The regression model produced an F -value of 1.795 with a significance value of 0.186. The regression coefficient shows that innovative food-processing skills have a positive unstandardised coefficient ($B = 0.166$) and standardised coefficient ($\beta = 0.183$). However, the t -value of 1.340 has a p -value of 0.186, which is greater than the 0.05 level of significance. Since $p = 0.186 > 0.05$, the null hypothesis is not rejected. Therefore, innovative food-processing skills do not significantly predict workforce readiness among Business Education students at the University of Calabar at the 0.05 level of significance.

Hypothesis two: H_{02} : Entrepreneurial skills do not significantly predict workforce readiness among Business Education students at the University of Calabar.

The result in Table 4 shows an R -value of 0.342, indicating a positive relationship between entrepreneurial skills and workforce readiness. The R^2 value of 0.117 indicates that entrepreneurial skills explain 11.7% of the variation in workforce readiness among the

respondents. The adjusted R^2 is 0.100, indicating that approximately 10.0% of the variation in workforce readiness is accounted for after adjustment for the model. The standard error of the estimate is 0.587. The ANOVA result shows an F -value of 6.904 with a significance value of 0.011. Since the p -value is less than 0.05, the regression model is statistically significant. The regression coefficient indicates a positive relationship, with an unstandardised coefficient of $B = 0.342$ and a standardised coefficient of $\beta = 0.342$. The t -value of 2.628 is statistically significant at $p = 0.011$. Since $p = 0.011 < 0.05$, the null hypothesis is rejected. Therefore, entrepreneurial skills significantly predict workforce readiness among Business Education students at the University of Calabar at the 0.05 level of significance (Table 5).

The findings of the study showed that Business Education students at the University of Calabar possessed innovative food-processing skills to a high extent, as indicated by the grand mean of 3.00. Similarly, the students possessed entrepreneurial skills to a high extent, with a grand mean of 3.01. However, the regression analysis revealed different patterns in the predictive contribution of the two variables to workforce readiness. Innovative food-processing skills showed a positive but statistically non-significant prediction of workforce readiness ($R = 0.183$, $R^2 = 0.033$, $\beta = 0.183$, $t = 1.340$, $p = 0.186$), indicating that the high level of these skills did not translate into a significant prediction of workforce readiness. In contrast, entrepreneurial skills showed a positive and statistically significant prediction of workforce readiness ($R = 0.342$, $R^2 = 0.117$, $\beta = 0.342$, $t = 2.628$, $p = 0.011$), accounting for 11.7% of the variation in workforce readiness. Overall, the findings indicated that although both innovative food-processing and entrepreneurial skills were possessed to a high extent, entrepreneurial skills made a statistically significant contribution to workforce readiness, whereas innovative food-processing skills did not.

Table 4: Regression analysis of entrepreneurial skills and workforce readiness.

Model	R	R ²	Adjusted R ²	Std. Error of Estimate	
1	0.342	0.117	0.1	0.587	
Model	Sum of Squares	df	Mean Square	F	Sig.
Regression	2.379	1	2.379	6.904	0.011
Residual	17.932	52	0.345	-	-
Total	20.311	53	-	-	-
Model	B	Std. Error	Beta (β)	<i>t</i>	Sig.
Constant	1.967	0.832	-	2.364	0.022
Entrepreneurial Skills	0.342	0.13	0.342	2.628	0.011

Discussion of the Findings

Innovative food-processing skills and workforce readiness

The findings of the study revealed that Business Education students at the University of Calabar possessed innovative food-processing skills to a high extent, as reflected in the grand mean of 3.00. The students indicated that they were able to apply modern food-processing techniques, develop and improve food products, use appropriate preservation methods, select suitable packaging techniques, operate food-processing equipment, minimise processing waste, apply quality-control practices and modify processing methods in response to consumer preferences and market demands. This finding suggests that the students have acquired a reasonable level of practical knowledge and competencies that could be useful in food-related businesses and other productive ventures.

Despite this relatively high level of innovative food-processing skills, the regression analysis showed that the skills did not significantly predict workforce readiness among the students. The analysis produced an R-value of 0.183, R² of 0.033, adjusted R² of 0.015, β of 0.183, *t*-value of 1.340 and *p*-value of 0.186. Since the *p*-value was greater than the 0.05 level of significance, the null hypothesis was not rejected. Thus, the result indicates that although the students reported possessing innovative food-processing skills to a high extent, these skills, when considered independently, did not make a statistically significant contribution to their overall workforce readiness.

This finding is partly consistent with the empirical evidence reviewed. Gebremeskel [13] reported that competencies acquired through agro-food processing technical and vocational education were important for graduates' competence and preparedness for employment. Similarly, Bohlscheid and Clark [14] found that career preparation among food science graduates involved competencies that supported their transition into employment. Metcalfe *et al.*, [15] identified a range of graduate capabilities required in food science and technology, while Weston *et al.*, [16] emphasised the importance of professional competencies in preparing food science graduates for workplace responsibilities. Van Berkum *et al.*, [17] also identified competencies considered important for graduates and professionals in food technology. In addition, Manalo and Sisnorio [18] found that adaptive and contextual competencies were relevant to the development of sustainable industrial capabilities among Food Technology students.

Although these studies generally point to the importance of food-related technical and professional competencies, the present finding differs in terms of the predictive relationship between innovative

food-processing skills and workforce readiness. The difference may be related to the nature and orientation of the programmes and populations examined. Most of the studies reviewed focused specifically on Food Science, Food Technology, agro-food processing or TVET students whose training is directly connected with technical occupations in the food sector. Business Education students, on the other hand, receive a broader education that encompasses accounting, business management, office administration, entrepreneurship and related competencies. Consequently, innovative food-processing skills may serve as complementary skills rather than the primary determinants of their overall workforce readiness.

Another possible explanation is that technical competence does not automatically translate into workplace readiness. A student may be able to process food products, preserve them and apply appropriate packaging techniques but still require additional competencies in communication, teamwork, digital literacy, marketing, financial management, problem-solving and adaptability before being fully prepared for a competitive labour market. The finding therefore suggests that innovative food-processing skills have practical value, but their contribution to workforce readiness may become more meaningful when combined with entrepreneurial and broader employability competencies.

Entrepreneurial skills and workforce readiness

The study further revealed that Business Education students possessed entrepreneurial skills to a high extent, as indicated by the grand mean of 3.01. The respondents reported competence in identifying viable business opportunities, developing business plans, determining costs and selling prices, formulating marketing strategies, managing financial resources, responding creatively to business challenges, taking calculated risks and applying creativity and innovation to improve business competitiveness. The result indicates that the students had acquired several entrepreneurial competencies that could support both employment and self-employment.

More importantly, the regression analysis established that entrepreneurial skills significantly predicted workforce readiness among the students. The analysis yielded an R-value of 0.342, R² of 0.117, adjusted R² of 0.100, β of 0.342, *t*-value of 2.628 and *p*-value of 0.011. Since the *p*-value was less than 0.05, the null hypothesis was rejected. The result indicates that entrepreneurial skills made a statistically significant positive contribution to workforce readiness. The R² value of 0.117 further shows that entrepreneurial skills explained 11.7% of the variation in workforce readiness among the respondents.

This finding is consistent with the empirical evidence reviewed. Eze

et al., [19] found that accounting, office technology and management, and marketing skills were important for self-employment among Business Education graduates. The present finding supports this position by demonstrating that entrepreneurial competencies can contribute to students' preparedness for the world of work. Similarly, Akeke *et al.*, [20] established that planning, marketing and business management skills were relevant to the employability of Business Education graduates in Cross River State. This is consistent with the present study because the entrepreneurial competencies examined included business planning, marketing, financial management and opportunity identification.

The finding also agrees with Ezeonwurie's [21] observation that entrepreneurship skills are important for enhancing the employability of Business Education graduates. Likewise, Manyahya and Mohammed [22] associated entrepreneurship skills acquisition with employability proficiency among Business Education graduates. Oluwalola [23] also established the relevance of entrepreneurial skill acquisition to employment generation among Business Education graduates. The consistency between these studies and the present finding provides further empirical support for the relevance of entrepreneurial competencies to workforce preparation.

The significance of entrepreneurial skills may be understood in the context of the changing nature of the contemporary labour market. Workforce readiness is no longer limited to the possession of academic qualifications or technical knowledge. Graduates are increasingly expected to identify opportunities, solve problems, manage resources, communicate effectively, adapt to changing circumstances and create value. Entrepreneurial skills provide students with practical competencies for applying what they have learned to employment, self-employment and business situations.

For Business Education students in particular, entrepreneurial competence can serve as a bridge between academic learning and practical economic activity. A student who can identify a business opportunity, develop a viable business plan, determine appropriate prices, market a product and manage financial resources is better positioned to apply knowledge beyond the classroom. The significant regression result therefore indicates that strengthening entrepreneurial competencies within Business Education may contribute to students' preparedness for the demands of a competitive labour market.

Implications of the Study

The findings of the study have implications for Business Education curriculum development, university teaching and learning, students, lecturers, policymakers and employers.

First, the finding that innovative food-processing skills were possessed to a high extent but did not significantly predict workforce readiness suggests that technical skills should not be treated as sufficient preparation for the workplace. Universities should therefore integrate food-processing competencies with broader employability skills such as communication, digital literacy, teamwork, problem-solving, adaptability, customer relations and entrepreneurship. Such integration would enable students to transform technical knowledge into practical occupational and economic value.

Second, the significant contribution of entrepreneurial skills to workforce readiness has important implications for Business Education curriculum development. Greater attention should be

given to practical entrepreneurship rather than relying mainly on theoretical instruction. Students should have opportunities to develop business plans, identify market opportunities, determine costs and prices, undertake marketing activities, manage financial resources and address real business challenges.

Third, the findings have implications for lecturers in Business Education. Teaching should provide students with opportunities to apply knowledge in realistic situations. Project-based learning, enterprise simulations, practical food-processing projects, business-plan development, product-marketing exercises and industry-based assignments could help students integrate technical, entrepreneurial and employability competencies.

Fourth, the findings point to the need for stronger university-industry collaboration. Since innovative food-processing skills alone did not significantly predict workforce readiness, students should be given opportunities to apply these skills in actual or simulated workplace environments. Partnerships with food-processing companies, small and medium-scale enterprises, agro-processing businesses and entrepreneurial organisations could expose students to practical experiences in production, quality control, packaging, marketing and enterprise management.

Finally, the findings indicate that workforce readiness among Business Education students is multidimensional. The relatively low explanatory power of innovative food-processing skills and the modest explanatory power of entrepreneurial skills indicate that other factors may also contribute to students' workforce readiness. Curriculum interventions should therefore adopt an integrated approach that develops technical, entrepreneurial and broader employability competencies rather than concentrating on a single category of skills.

Conclusion

Based on the findings of the study, it was concluded that Business Education students at the University of Calabar possessed innovative food-processing and entrepreneurial skills to a high extent. The high mean ratings indicate that the students perceived themselves as having competencies in food processing, preservation, packaging, quality control, business planning, marketing, financial management, opportunity identification and business innovation. However, the inferential findings revealed differences in the contribution of the two categories of skills to workforce readiness. Although innovative food-processing skills were possessed to a high extent, they did not significantly predict workforce readiness. This suggests that technical food-processing competencies, when considered independently, may not be sufficient to explain the overall preparedness of Business Education students for the competitive labour market.

Entrepreneurial skills, on the other hand, significantly predicted workforce readiness. This finding indicates that competencies relating to opportunity identification, business planning, marketing, financial management, creativity, calculated risk-taking and problem-solving have a measurable relationship with students' preparedness for employment and self-employment. The study therefore concludes that innovative food-processing skills constitute useful complementary competencies, whereas entrepreneurial skills make a significant contribution to workforce readiness among Business Education students at the University of Calabar. An integrated approach that combines technical, entrepreneurial and broader employability competencies is therefore important for preparing

students to respond effectively to the changing demands of the 21st century labour market.

Recommendations

Based on the findings and conclusions of the study, the following recommendations were made:

1. Strengthen practical entrepreneurship: Business Education programmes should emphasise opportunity identification, business planning, marketing, financial management and enterprise development.
2. Integrate food-processing and entrepreneurial skills: Food-processing training should include product development, packaging, costing, pricing, marketing and commercialisation.
3. Promote experiential and industry-based learning: The University should provide practical projects, internships, enterprise simulations and partnerships with relevant industries and small businesses.
4. Regularly update curriculum and teaching practices: Lecturers should use practical, problem-based approaches, while curricula should incorporate digital literacy, creativity, teamwork, problem-solving and other emerging employability competencies.

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