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Impact of an Agripreneurial Curriculum on the Attitudes of Nigerian Undergraduates through the Mediating Role of Entrepreneurial Orientation

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Abstract: This study investigated the impact of an agripreneurial curriculum (AC) on student attitudes, with a specific focus on the mediating role of entrepreneurial orientation (EO). A survey of 311 students from four agricultural universities in Nigeria was conducted using a structured questionnaire designed and administered through Google Forms. The data were analyzed using structural equation modeling. The research findings revealed that certain elements of EO, such as proactiveness and innovation, significantly predicted students' agripreneurial attitudes and skills. Interestingly, risk-taking ability did not emerge as a significant factor in shaping agripreneurial attitudes. Furthermore, the findings revealed that an agripreneurship curriculum is a major predictor of students' EO; however, it had no direct significant effect on students' attitude and skill development. The key recommendation stemming from this research is to enhance the AC focus on improving students' EO, thereby influencing their agripreneurial attitudes and fostering outcomes conducive to agribusiness creation. This research sheds light on the intricate dynamics that influence students' agripreneurial intent.

Keywords: agripreneurship curriculum, attitude, proactiveness, risk-taking, innovation.

农业创业课程通过创业导向的中介作用对尼日利亚本科生态度的影响

摘要：本研究调查了农业创业课程(AC)对学生态度的影响，特别关注创业倾向(EO)的中介作用。对来自尼日利亚四所农业大学的311名学生进行了调查，调查采用结构化问卷，该问卷通过谷歌表单设计和管理。使用结构方程模型分析数据。研究结果表明，EO的某些要素（例如主动性和创新性）可显著预测学生的农业创业态度和技能。有趣的是，冒险能力并不是影响农业创业态度的重要因素。此外，研究结果表明，农业创业课程是学生EO的主要预测因素；然而，它对学生的态度和技能发展没有直接的显著影响。本研究提出的主要建议是加强AC对改善学生EO的关注，从而影响他们的农业创业态度并促进有利于农业企业创建的成果。本研究揭示了影响学生农业创业意图的复杂动态。

关键词：农业创业课程、态度、主动性、敢于冒险、创新。

1. Introduction

Today, agripreneurship is widely recognized as a valuable national asset, with agripreneurs serving as the driving force at the national and global levels [1]. Given the increasing importance of agripreneurship worldwide, countries must embrace and encourage this initiative. In recent years, the study and practice of entrepreneurship have seen a notable surge in the recognition of agricultural entrepreneurship, also known as agripreneurship. Consequently, the identification, assessment, and pursuit of entrepreneurial opportunities within the agricultural sector are now considered distinct aspects of entrepreneurship [2, 3]. While economists and policymakers argue for economic diversification to reduce dependence on rapidly growing industries and address the perceived neglect of agriculture and related sectors, there is an increasing consensus regarding the significant contribution of the agricultural sector to a nation's economic growth and development [3, 4].

According to Agriculture for Impact [5], agriculture is a dynamic industry that offers numerous entrepreneurial possibilities throughout the entire agribusiness value chain. In the Nigerian context, agriculture contributed 23.3% to the GDP in the first half of 2022. This demonstrates a positive trend compared to previous years, with a performance of 25.88% in 2021 and 26.21% in 2020. These numbers demonstrate that the agricultural industry provides a foundation for achieving sustainable development goals by 2030. In light of this, it is crucial for agripreneurs to have a variety of entrepreneurial skills to identify prospective business opportunities in agriculture, gather funding, launch, and run successful agricultural business ventures [4, 6, 7, 41].

The Agripreneurship Curriculum was created to help students launch agricultural businesses that are focused on the market. Per Mukembo et al. [8], an agripreneurship curriculum aims to equip individuals with the necessary knowledge, attitudes, and skills to engage in agribusiness activities. This involves instruction in cognitive abilities, including the acquisition of knowledge, self-reflection, the development of mental models, the effective management of resources, the identification of opportunities, communication with others, strategic planning, and the promotion of products [9]. The curriculum also emphasizes non-cognitive skills that are crucial for the growth of agribusiness companies, such as entrepreneurial zeal, self-efficacy, proactivity, invention, and perseverance. Secundo et al. [10] argued that the adoption of an innovative, technology-based agripreneurship curriculum in higher institutions could help with crises like the shortage of employment prospects in the nation. However, they draw attention to the fact that the current curriculum's content is inadequate and has to be revised to include pertinent and useful components that are in line with the realities

of the agriculture industry today. This redesign should emphasize agripreneurial attitudes and skills, such as creativity and innovation, in the agricultural sector.

Similarly, Gedik et al. [11] demonstrated that an agripreneurship curriculum fosters an entrepreneurial mindset within the agricultural sector by equipping participants with the necessary skill sets, knowledge, and behavioral patterns to become successful agripreneurs. In addition to agripreneurship, EO has also been acknowledged by scholars and researchers as a construct that is directly associated with agripreneurial intentions and agribusiness attitudes. Bolton and Lane [12] stated that EO refers to the set of characteristics, behaviors, and attitudes exhibited by individuals or organizations that are conducive to entrepreneurial activities. It includes dimensions such as risk-taking propensity, innovativeness, and proactiveness [13]. Agripreneurial intentions, on the other hand, specifically pertain to entrepreneurial activities in the agricultural sector [14]. Therefore, individuals' EO provides a fertile ground for developing agripreneurial intentions [12]. By applying entrepreneurial principles and behaviors within the agricultural context, individuals and organizations can cultivate a mindset and desire to pursue entrepreneurial activities in agriculture.

Despite the growing interest in entrepreneurship and the mindset of entrepreneurs, limited research has explored the influence of an agripreneurship curriculum on the entrepreneurial outlook of undergraduate students, particularly with respect to incorporating an EO [15, 16]. This study aims to fill this research gap by developing a theoretical model that sheds light on the mediating role of EO in the relationship between an agripreneurship curriculum and entrepreneurial attitudes of undergraduate students in Nigeria. This research intends to examine the impact of an agripreneurship curriculum and an EO on the development of an entrepreneurial mindset among undergraduate students in the agricultural sector, with the ultimate aim of preparing them for success as agripreneurs.

2. Theoretical Framework

To promote the progress of agripreneurship education research, various models and theories have been developed and refined. One may argue that these models serve as the foundation for many investigations because they help researchers construct theories and ultimately lead to novel discoveries that broaden a particular subject. This theory was developed in the late 1980s by social psychologist Azizen and is considered an extension of earlier rational behavior theories. The theory of planned behavior (TPB) is widely used in various fields, including entrepreneurship, to understand and predict the intentions and behavior of individuals [17]. According to Eletta et al. [18], the TPB is a well-known psychological theory that

explains human behavior, especially in the context of decision-making and goal-directed action. In the context of an agripreneurship curriculum, the TPB can be applied to understand and anticipate the entrepreneurial aspirations and intentions of Nigerian students [19-21].

Aligba and Fusch [22] found that the TPB has a strong predictive capacity for determining business intent. This suggests that attitudes toward entrepreneurship, subjective norms (perceptions of social pressure to become entrepreneurs), and perceptions of behavioral control play a crucial role in influencing students' intentions to participate in agripreneurship. Panwar Seth [23] demonstrated that the TPB emphasizes the importance of attitudes in shaping intentions by understanding the factors that influence students' attitudes toward agripreneurship. Educators and policy makers therefore need to design interventions and education programs that foster positive attitudes and strengthen entrepreneurship in the agricultural sector. Similarly, Ajzen [24] posited that students' inclination to become agricultural entrepreneurs is shaped by their perception of social pressure, including the expectations of their family, peers, and society. According to Ajzen [24], providing encouragement and guidance for entrepreneurial engagement in agriculture can create an environment that fosters and promotes these engagements by acknowledging key social groups and utilizing their support.

Therefore, this theory offers a theoretical foundation for formulating interventions and policies aimed at fostering student agricultural entrepreneurship. By targeting key determinants of intention (attitudes, subjective norms, and perceived behavioral controls), educators, policymakers, and agricultural organizations can design programs that promote entrepreneurial skills development, provide instructional opportunities, and build a supportive ecosystem for students interested in agricultural entrepreneurship.

2.1. Agripreneurial Curriculum and Attitudes

In 2005, the National Universities Commission (NUC) implemented the inclusion of entrepreneurship education in the tertiary-level curriculum at the behest of the government, with the aim of fostering an entrepreneurial spirit and promoting self-reliance. However, the anticipated results of increased interest in agripreneurial activities and self-sufficiency have yet to come to fruition, and many young people continue to seek out scarce white-collar positions [25]. According to Maxwell et al. [15], the curriculum is a fundamental tool often adopted by educational institutions to expose students to various entrepreneurial learning experiences.

Due to the diversity of entrepreneurship, entrepreneurship education curricula cover a wide range of subjects to help students improve their

entrepreneurial knowledge, attitudes, and behaviors within their field of study [26]. Therefore, an agripreneurship curriculum serves as the means by which students are exposed to the events that make up an agripreneur's life, and this knowledge cannot be overstated. Iwuala [60] defined an entrepreneurship curriculum as "a program or portion of a program designed to equip individuals with the necessary skills to establish and acquire small businesses." Similarly, Obi and Okekeokosisi [27] see an EC as a systematic program that informs, trains, educates, monitors, and evaluates entrepreneurs in society.

The agricultural industry presents a wealth of opportunities in various areas, such as crop cultivation, livestock management, orchard operations, mechanization, fisheries, marketing, processing, and forestry. The agripreneurship curriculum is one of the initiatives to increase the involvement of younger generations in agriculture [25]. Meanwhile, Daniel and Irene [28] suggested that the curricula ought to comprise opportunities for students to acquire knowledge and proficiency in the business sector of agriculture and practical experience in entrepreneurship. Thus, numerous universities are swiftly incorporating entrepreneurship training as an option in their agricultural curricula, enabling students to acquire business-related skills and gain practical experience simultaneously. Attitude plays a critical role in shaping the willingness of youth to participate in these agricultural opportunities [29]. Hajong and Padaria [30] affirmed that a positive attitude is a crucial requirement for starting an agripreneurial business. Thus, as agripreneurs display various traits that make up their agripreneurial attitude, understanding it has attracted the attention of numerous scholars. Previous research has shown that some youths have stayed away from the industry as a result of its low pay and demanding physical requirements [25, 31]. Furthermore, Onuekwusi et al. [32] attributed the lack of interest in agripreneurship to the lack of agripreneurship skills, start-up capital and high-risk levels. Yusoff et al. [33] revealed that agripreneurship training offered by regional higher education institutions is sufficient for fostering students' entrepreneurial skills and intentions. Correspondingly, Olokundun [21] and Iwu et al. [34] agree that an entrepreneurship curriculum enhances entrepreneurial development in terms of attitudes and skills in a variety of settings like the agricultural sector.

The growing interest in fostering entrepreneurial attitudes and skillsets among non-management students has prompted a closer examination and assessment of university entrepreneurship curricula to verify their pertinence and suitability. Most entrepreneurship education curricula aim to foster entrepreneurial attitudes [35-37] and entrepreneurial competences [38, 39]. There has been an increasing emphasis on the importance of cultivating university students'

entrepreneurial potential considering social and economic developments. Per Matlay [40], imparting education in entrepreneurship is instrumental in equipping students with the requisite knowledge and capabilities that are vital for achieving success in the entrepreneurial endeavor. The cultivation of entrepreneurial mindset, which is essential for assuming self-employment, can be facilitated by these skills. By leveraging these capabilities, potential agricultural entrepreneurs can identify opportunities and promote the feasibility and desirability of their ventures.

Tiberius et al. [37] posited that entrepreneurial leadership, mindset, skills, opportunity creation, opportunity identification, and the ability to transform uncertainty into opportunity are just a few examples of entrepreneurial attitudes and competencies that are particularly geared toward advancing the field of entrepreneurship. Similarly, Gedik et al. [11] stated that successful entrepreneurs should possess traits like the capacity for business planning in a variety of contexts and settings, as well as strong interpersonal, management, and leadership skills, as well as the ability to market and negotiate goods and services and conduct relevant market research. However, According to Mukembo et al. [8], one of the primary factors contributing to the difficulties faced by graduates in seamlessly transitioning from their academic pursuits to the professional sphere is the discrepancy between the modern workplace's demands and the antiquated curricula that fail to impart the necessary skills to students. A thriving agri-food value chain demands professionals who possess not only technical expertise in production, but also entrepreneurial skills in marketing, processing, and logistics and essential soft skills such as effective communication and collaboration [61]. Therefore, young individuals gain organizational skills such as time management, leadership development, and interpersonal skills through the entrepreneurship education curriculum [42].

Therefore, it is crucial for decision-makers and educators to comprehend what motivates entrepreneurial attitudes because doing so can enhance the efficacy of government policies and educational initiatives. Because there have not been many studies that address this gap, we use the TPB to identify the mechanism connecting the perceived agripreneurship curriculum to students' attitudes and skill development. To sum up, this study examines the direct effect of an AC on the development of students' entrepreneurial orientation, attitudes, and skills. Therefore, the following hypotheses are proposed.

H1: An AC has a significant influence on developing agripreneurial attitudes and skills.

H2: An AC has a significant influence on the development of EO (proactiveness, risk level, and innovativeness).

H3: EO significantly influences undergraduates' attitudes and skills.

2.2. EO as a Mediator between an AC and Agripreneurship Attitudes and Skills

Originating from general entrepreneurship research, EO is a significant and well-recognized construct that has gained increased attention in agricultural entrepreneurship research [43]. Owing to the agricultural sector's evolving environment, which presents both opportunities and challenges, farmers are now required to adopt an entrepreneurial mindset. This shift in approach is necessitated by the increasing demand for their products and services [44]. Additionally, the effects of climate change, the infiltration of modern food supply chains, diminishing levels of support for farmers, and other contributing factors have necessitated that producers adopt an entrepreneurial mindset to thrive and maintain their competitiveness. In the mainstream literature, there appears to be a growing consensus that the EO construct comprises three dimensions: innovativeness, risk-taking, and proactiveness [45]. These three dimensions have also been investigated in the agricultural sector [46, 47]. According to Wiklund and Shepherd [48], EO is the ability of a firm or individual farmer to innovate to revitalize market offers, take risks by trying out untested products, services, and markets, and be more aggressive than rivals in responding to new business prospects. According to Sánchez [49], students who receive entrepreneurship education and participate in entrepreneurship courses are expected to exhibit self-assurance, motivation, proactivity, innovation, problem-solving skills, and other necessary competencies. Agripreneurship education is believed to further cultivate an entrepreneurial mindset in students, leading to a more positive outlook on becoming agripreneurs. This perspective is supported by Cho and Lee [50], who suggest that entrepreneurs with an entrepreneurial mindset are better equipped to identify novel opportunities, accumulate resources for innovation, and successfully launch new products. Agripreneurship is a risky industry due to its focus on perishable agricultural products that are unique and challenging and operates under uncertain conditions. Therefore, it is imperative that agripreneurs be proactive in identifying opportunities and innovative in their approach to product design and new value creation.

When dealing with the fast-paced and dynamic agricultural world, EO is essential for agripreneurs to succeed, especially when it comes to seeing business possibilities and overcoming obstacles to entrepreneurship [33]. Also, agripreneurial attitudes and skills have typically been linked to a moderate level of risk inclination, and the extant literature reveals that risk-taking tendencies predict the formation of agripreneurial attitudes [51]. Furthermore, positive

attitudes and innovators' propensity to become agripreneurs are closely related; innovative agripreneurs produce better products, enhance existing products, and increase the production efficacy and efficiency [33, 43]. Researchers have discovered a correlation between an individual's capacity for innovation and their inclination to start their own businesses [52]. By extending this analysis to the realm of agripreneurship, it may be speculated that individuals who possess the innovative prowess to create novel agriculture-based products or transform existing ones will exhibit more favorable perspectives and a positive attitude toward becoming agripreneurs compared to those who do not possess such abilities. In addition, individuals who are proactive actively engage in the process of identifying opportunities and take real action to seize them, regardless of their objectives [33]. Undertaking proactive measures involves taking action in advance of competitors to either enhance existing circumstances or introduce innovative products and methods.

Based on the notion that entrepreneurship can be acquired and disseminated, it is essential that universities design their agripreneurial curricula to cultivate students who possess an entrepreneurial mindset. The university-level curriculum for agripreneurship aims to enhance students' understanding and perception of agripreneurship as a viable career choice and influence their attitudes and proficiencies. Therefore, the following hypotheses are proposed:

H4: The EO of students mediates the relationship between the AC and their agripreneurial attitudes and skills.

3. Methodology

This study adopted a quantitative method. The design was a survey of 311 randomly selected respondents from four agricultural universities. Out of the 397 invited participants, 311, representing 78% of the expected, completed the questionnaire. The 311 were invited from 58,011 undergraduates in different programs at four agricultural universities. The Taro Yamane formula was used to determine the sample size. The stratified sampling method was implemented to allocate questionnaire responses from students in each of the universities (Makurdi, 121; Abeokuta, 123; Umudike, 127; Omu-Aran, 26). Lottery techniques served as the basis of randomization. The questionnaire was administered to the respondents through Google Forms. The participants were contacted via their email and WhatsApp accounts.

3.1. Measurement of Variables

The dependent variable for this study was the attitude of respondents toward agripreneurship. The independent variable was the agripreneurship curriculum, and EO was the mediating variable. The

data collection tool was a structured questionnaire. The survey consisted of two segments: the biodata section, which encompassed inquiries about the respondents' demographic information, and the core-subject matter segment, which posed inquiries about the focal points of the study. The question-response framework of the instrument employed a five-point Likert scale, encompassing responses of strongly agree (5 points), agree (neutral), disagree (1 point), and strongly disagree (5 points). Five questions were employed to evaluate the AC. Sample statements included "The agricultural curriculum contents present students with the events that make up an agripreneur's life" and "The agripreneurship curriculum is effective and informs me about the pertinent skills in my field." Additionally, six items were used to assess agripreneurial attitude and skills, such as "I can prepare a feasibility study and business plan for my agribusiness" and "I can negotiate a business deal effectively." Moreover, 11 Likert items were used to gauge entrepreneurship orientation, with three questions pertaining to proactiveness ("I can identify a good opportunity long before others can"), four items addressing risk taking, and four items evaluating innovative capacity.

3.2. Compliance with Ethical Standards

The authors obtained the respondents' consent to participate in the study. Also, participants were guaranteed that the data provided were solely for research and that all information would be treated with utmost confidentiality.

3.3. Instrument Reliability and Validity

The reliability of the research instrument was assessed using the Chronbach alpha test. A computed alpha value of 0.771 was obtained. It is implied that the questionnaire's questions are internally consistent, and the instrument is therefore acceptable and reliable in line with the rule of thumb posited by Veal [53]. Content analysis was utilized to verify the questionnaire items, in addition to principal component analysis.

Table 1 Reliability statistics (Field survey, 2023)

Variable	Cronbach's alpha coefficient	Remark
Entire Instrument	0.771	Adequate
Agripreneurship Curriculum	0.722	Adequate
Agripreneurial attitude	0.823	Adequate
EO	0.847	Adequate

3.4. Data Analysis Method

Data analysis was performed using structural equation modeling. The method of modeling using structural equations allowed for the measurement of the strength and direction of the influence of the independent variable (agripreneurship curriculum) on the dependent variable (agripreneurship intention) and also assessed the mediating role of EO.

4. Results and Discussion

Table 2 shows the descriptive statistics of the study. The results reveal that the mean and standard deviations were 4.16 (0.515), 4.02 (0.583), 4.202 (0.574), 4.057 (0.522), and 4.01 (0.629) for AC, agripreneurial attitudes and skills, and EO variables (proactiveness, risk-taking, and innovativeness), respectively. The outcome shows that all means were higher than 3, which is the midpoint, indicating that all respondents provided positive responses. The standard deviations of 0.6296 and 0.5159, respectively (Table 2), indicate that innovativeness had the largest variability in perception and that agripreneurship curriculum had the lowest variability.

Table 2 Variables and their means and standard deviations (Field survey, 2023)

Variables	Mean	Std. Deviation
Agripreneurial_Curriculum	4.1646	.51597
Agripreneurial_Attitudes_and_Skills	4.0220	.58365
Proactiveness	4.2026	.57428
Risk level	4.0571	.52225
Innovativeness	4.0161	.62969

From Table 3, the direct effects of AGPC on the EO variables show that the coefficients were 0.3932, 0.4092, and 0.5364 for proactiveness, risk level, and innovativeness, respectively. This indicates that the relationship between AGPC and EO is

$$EO = 0.3932Pro + 0.4092RL + 0.5364Inn \quad (1)$$

Equation (1) coefficients show that a unit change in the agripreneurship curriculum has a 39%, 41%, and 54% impact on the proactiveness, risk level, and innovativeness of students, respectively. The computed Z and associated asymptomatic probabilities were -6.66 (0.000), 7.80 (0.000), and 8.63 (0.000) for proactiveness, risk level, and innovativeness. This implies that the AC has a positive and significant influence on the students' EO. This finding is in line with the study by Singh [62], who revealed that agripreneurs were more proactive and innovative than traditional farmers in their farming approaches and noted that the agripreneurs' intensity of cropping and diversified crop and farming systems differentiated them from other farmers. Furthermore, the proactive approach of agripreneurs was highlighted in their proficiency in soil testing to determine the appropriate amount of soil nutrients needed, application of seed treatments prior to use, and employment of balanced fertilizers, as contrasted with traditional farmers. This result supports the findings by Al-Awlaqi et al. [54] that there is a positive and substantial association between entrepreneurship training and all three dimensions of EO.

Table 3 Structural equation model of the agripreneurial curriculum and attitude (direct effect) (The authors)

Path	Coef.	Z	P > z
AGPC → Proactiveness	.393	6.66	0.000**

AGPC → Risk level	.409	7.80	0.000**
AGPC → Innovation	.536	8.63	0.000**
AGPC → AGP_As	.040	0.83	0.404
Proactiveness → AGP_As	.203	4.53	0.000**
Risk level → AGP_As	.102	1.60	0.109
Innovation → AGP_As	.513	9.94	0.000**

** p < .05, β - coefficient, and Z - computed z-value

The findings from the structural equation model's analysis of the direct effects of AGPC and AGP_AS (attitudes and skills) with EO serving as the mediating variable demonstrate that the predictor coefficients were 0.0400, 0.2027, 0.1018, and 0.5128, respectively, for the agripreneurship curriculum and EO variables (proactiveness, risk disposition, and innovation). The research model is as follows:

$$AGP_AS = \beta_0 + \beta_1 Pro + \beta_2 RL + \beta_3 Inn + \beta_4 AgpC + \dots e$$

The relationship that is hypothesized to exist between the agripreneurship curriculum and agripreneurship attitude, with EO serving as the mediating variable, is expressed as follows:

$$AGP_AS = \beta_1 0.2027Pro + \beta_2 0.1018RL + \beta_3 0.5128Inn + \beta_4 0.0400AgpC + e \quad (2)$$

Equation (2) indicates that the AC will cause a 4% change in agripreneurial attitudes and skills. A unit change in proactiveness will cause a 20.27% change in the agripreneurial attitude and skills, a unit change in risk level will cause a 10.18% change in the agripreneurial attitude and skills of undergraduates, and a unit change in innovativeness will lead to a 51.28% change in the agripreneurial attitude and skills of the students (Table 3).

The result also indicates that the computed Z and associated asymptomatic probabilities were -0.83 (p < 0.404), 4.53 (p < 0.000), 1.60 (p < 0.109), and 9.94 (p < 0.000) for the agripreneurship curriculum, proactiveness, risk level, and innovative capacity of the students, respectively. This indicates that proactiveness and innovation positively and significantly predicted students' agripreneurial attitudes and skills. However, the results of the agripreneurship curriculum and risk level were not statistically significant, whereas the other explanatory variables were statistically significant. Consequently, we can conclude that at the 95% confidence level, the proactiveness and innovative capacity of students predicted their agripreneurial attitudes. The findings are corroborated with the study by Onuekwusi et al. [32], who noted that a high level of risk impeded agripreneurship attitude development. In addition, Koe [55] revealed that risk-taking capacity did not significantly influence entrepreneurial attitudes and intentions, but proactiveness and innovativeness were influential factors. Meanwhile, Babbie [56] posited that most youths do not find agriculture appealing, which contributes to their negative perception. However, Ibidunni et al. [57] revealed that individual risk tolerance has a positive influence on business opportunity identification and intention,

suggesting that an individual risk tolerance level increases the likelihood of eventual entrepreneurial behavior.

This implies that the current AC is perceived as outdated and irrelevant by students due to its failure to incorporate recent trends, industry linkages, technologies, and agripreneurial practices or its lack of an interdisciplinary approach. Only proactive and innovative students can apply the concepts learned in their local contexts, with additional information sourced on their own. By implementing a comprehensive curriculum, students acquire hands-on experience in the entrepreneurial aspects of agriculture. This encompasses business planning, marketing tactics, financial management, and the incorporation of technology to improve productivity and ensure sustainability. In addition, when the curriculum addresses inherent risks associated with agribusiness, it is necessary to teach students how to assess and manage these risks effectively by encouraging a calculated approach to risk-taking. In this manner, students will be more inclined to leave their comfort zones and initiate entrepreneurial pursuits within the

agricultural industry.

Table 4 represents the result of the SEM (indirect effects) of EO as a mediator between the agripreneurship curriculum and students' attitudes and skills, revealing that the coefficient is 0.3965. The Z value and its corresponding p value for the model are 9.56 and $p < 0.000$, respectively (Table 4). The implication is that the agripreneurship curriculum significantly influences the attitude and skills of students through an EO. The result from the direct model shows a positive but insignificant correlation between the AC and the attitude of the students, with a beta-value of 0.0400 and a p-value of 0.404. Furthermore, the EO variables (proactiveness, risk level, and innovativeness) are significantly associated with agripreneurship attitudes and skills. Meanwhile, the proactiveness and innovativeness variables had beta values of 0.2027 and 0.5128, respectively, with a p-value of 0.000. However, the risk level with a beta value of 0.1018 and a p-value of 0.109 had an insignificant effect on the attitude and skills of the students.

Table 4 Mediating effects of EO on the agripreneurial curriculum and attitudes (The authors)

Path	Coef.	Z	P> z	Hypotheses	Remark
Direct Model					
AGPC→ AGP_As	.040	0.83	0.404	H ₁	Not Confirmed
AGPC→Proactiveness	.393	6.66	0.000**		
AGPC→Risk level	.409	7.80	0.000**		
AGPC→Innovation	.536	8.63	0.000**	H ₂	Confirmed
Proactiveness→ AGP_As	.203	4.53	0.000**		Confirmed
Risk level→AGP_As	.102	1.60	0.109		Not Confirmed
Innovation→AGP_As	.513	9.94	0.000**	H ₃	Confirmed
Indirect Model					
AGP_As→EO→AgpC	..397	9.56	0.000**	H ₄	Fully Supported

** p < .05

This indicates that at the 95% confidence level, proactiveness and innovativeness predicted students' attitudes and skills. Furthermore, the evidence indicates that the introduction of EO modifies the impact of an agripreneurship curriculum on the agripreneurial attitudes and skills of students, increasing the beta value from 0.0400 to 0.3965 and the Z value from 0.83 to 9.56. This indicates that the conditions for EO to act as a mediator are fulfilled as the statistical relationship between the independent (AC) and dependent (agripreneurial attitudes and skills) variables is stronger when the mediator is included.

The results indicate that the curriculum fosters the development of proactive approaches in students to recognize and exploit opportunities in the agricultural sector. By doing this, students are empowered to foresee and leverage market trends and emerging technologies. In addition, in an environment where students are introduced to advanced technologies, innovative methodologies, and practices, they are encouraged to think creatively and devise solutions to tackle the challenges faced in agriculture, agri-

processing, and related sectors. Additionally, instilling the importance of making well-informed decisions and taking calculated risks significantly impacts the development of students' agripreneurial mindset and skills. The results are in line with the study by Ouko et al. [14], which affirms that entrepreneurship education and government support like start-up capital or agricultural incubation centers stimulates youth engagement in agripreneurial activities. Furthermore, Omodanisi et al. [58] posited that elements such as greenhouse farming, soil analysis, hydroponics, and drone agriculture, which are associated with smart agripreneurship, have made a substantial contribution to reducing food costs and enhancing affordability, both of which are important aspects of EO. This implies that as students adopt an entrepreneurial mindset, they are implicitly motivated to investigate and experiment with innovative approaches and concepts in the realm of agriculture. This fosters the development of forward-thinking abilities, boosts their confidence, and enhances their self-efficacy in addressing agricultural challenges. Proactiveness

empowers students to take the initiative, seek out opportunities, and exhibit innovation. This might involve identifying new technologies, practices, and markets that can be leveraged for sustainable agriculture.

According to the guidelines proposed by Mackinnon [59] for mediation, a mediating variable functions as an intermediary in the causal chain that connects the independent and dependent variables. The independent variable leads to the mediating variable, which subsequently influences the dependent variable. Therefore, it can be concluded that EO variables mediate the relationship between an AC and students' attitudes. The implication of this finding is that the curriculum content significantly influences the students' EO. As the students become more innovative and intensify their proactive ability, their attitude

toward agripreneurship becomes increasingly positive.

The results of the goodness-of-fit equation test reveal that the variance of the fitted model for AGP attitude and skills is 0.2951, while the predicted variance is 0.1486, and the residual variance is 0.1464. Specifically, the variance for proactiveness is 0.3287, with a corresponding predicted variance of 0.0410 and a residual variance of 0.2877. For the risk level variable, the fitted variance is 0.2718, with a predicted variance of 0.0445 and a residual variance of 0.2274. The fitted variance for innovation is 0.3952, with a predicted variance of 0.0764 and a residual variance of 0.3189. The overall value of the equation is 0.3673, indicating that 36.73% of the variation in the agripreneurial attitude and skills can be attributed to the explanatory and mediating variables.

Table 5 Goodness-of-fit equation test (The authors)

Dependent variables observed	Variance			R-squared	Mc	mc2
	Fitted	Predicted	Residual			
AGP_AS	0.295	0.149	0.146	0.504	0.710	0.504
Proactiveness	0.329	0.041	0.288	0.125	0.353	0.125
Risk level	0.272	0.044	0.227	0.164	0.404	0.164
Innovation	0.395	0.076	0.319	0.193	0.440	0.193
Overall	.37					

Notes: mc - correlation between the dependent variable and its prediction; mc2 = mc^2 is the Bentler-Raykov squared multiple correlation coefficient.

5. Conclusion

We tested an SEM that hypothesized that an agripreneurship curriculum influences agripreneurship attitude and skills through EO (Fig. 1). The finding clearly indicates that students' agripreneurial attitudes and skills can be enhanced only through EO (proactiveness and innovation). Given the diversity of EO, three scales were used to evaluate the concept in this study. Empirically, proactiveness and innovation were relevant and significant predictors of students' agripreneurial attitudes and skills. However, risk-taking was positively related but not a significant predictor. Thus, if students are provided with relevant agripreneurship curriculum contents that support risk-taking, their disposition toward risk-taking may enhance.

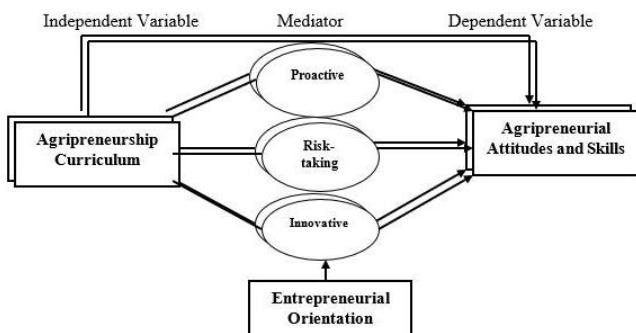


Fig. 1 Study's conceptual framework (The authors' research, 2023)

Contrary to the common belief, an AC is not necessarily for agricultural students alone. Students

from other disciplines can also become agripreneurs, provided they receive comprehensive information about and actively engage with the agripreneurship curriculum. Meanwhile, the AC significantly predicted students' EO. This suggests that entrepreneurship educators, particularly in agricultural settings, should focus more on selecting the right curriculum contents that can optimize students' EO. Particularly, the curriculum designers ought to take into account the incorporation of industry-demanded skills to encourage individuals' investigation and improve students' agripreneurial mindset and abilities.

5.1. Practical Implications

Agripreneurship is significantly influenced by a country's socioeconomic situation, educational attainment, and cultural traditions. By implementing a suitable curriculum that encourages and acknowledges agricultural entrepreneurship as a viable career choice, one can develop an entrepreneurial education. Agriculture is thought to have various prospects and should be encouraged as one of the crucial economic areas. Policy changes must be implemented to promote and support agripreneurs in the community. To improve students' EO, university administrations should design their agripreneurship curricula with this goal in mind. This should also be the focus of any entrepreneurship education in the agricultural sector. In addition, practical instruction is necessary to help students improve their proactivity and develop innovative abilities.

Curriculum designers for agripreneurship should prioritize fostering locally-based agripreneurs who possess entrepreneurial qualities, including innovation, risk-taking, and proactivity in addressing agricultural challenges. To achieve this objective, a comprehensive evaluation of the university's agripreneurship curriculum is necessary to ensure that all its components align with this strategy. Additionally, educators must pinpoint the essential conditions that encourage students' risk-taking propensities. Mentorship is essential in helping students surmount their trepidation toward the challenges and prospects that exist in the agricultural sector. To refine and enhance the EO and agripreneurial attitude of aspiring agripreneurs, successful agripreneurs can also be included in the agricultural curriculum design.

5.2. Limitations and Suggestions for Further Studies

This study has some limitations. For example, other studies have used only qualitative approaches, and some have combined quantitative and qualitative methods to reach more comprehensive conclusions. Additionally, this research investigated the perceptions of undergraduate students from four agricultural universities regarding the curriculum offered in the field of agriculture. To ascertain the long-term impact of the curriculum on students' attitudes, another research might examine the undergraduate and graduate groups. Additionally, comparable research can broaden the study's focus by incorporating other educational institutions that provide their students with agripreneurship courses. Future studies will also have the opportunity to investigate any moderators that might affect the association between the agricultural study curriculum and attitudes or other relevant variables.

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