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EMPOWERING RURAL YOUTH THROUGH SUSTAINABLE INNOVATION, ENTREPRENEURSHIP AND PEER LEARNING IN AGRICULTURE

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Abstract

Empowering rural youth in agriculture through peer learning can unlock the sector's potential and drive sustainable growth. This study, conducted in Jerash, Jordan, surveyed 54 participants aged 25 to 30 following two 30-minute interactive sessions focused on agricultural entrepreneurship. These sessions covered business planning, marketing, and sustainable farming practices. The participant group had a near-equal gender distribution and varied educational backgrounds, with many holding college degrees. The analysis revealed that education level significantly affected participants' pre-session knowledge, and there was a strong positive correlation between pre-session knowledge and post-session attitudes toward agricultural entrepreneurship. Interestingly, age did not have a notable influence on these attitudes. The study also found gender disparities in post-session knowledge scores. While education level did not significantly affect participants' intentions to start an agricultural business, age positively correlated with post-session knowledge scores, particularly after the sessions. These findings emphasize the importance of educational diversity, targeted learning programs, and the role of prior knowledge in shaping attitudes toward entrepreneurship. The study also draws attention to gender disparities and the influence of socioeconomic factors on education, underscoring the need for inclusive strategies to empower rural youth in agriculture and promote sustainable growth.

Keywords: *Agribusiness Engagement, Capacity Building, Farming Education, Knowledge Transfer, Rural Development.*

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1. INTRODUCTION

1.1 Empowering rural youth in agriculture

Agriculture plays a vital role in many economies, especially in rural areas. By overcoming barriers like limited resources, skill gaps, and the appeal of urban life, rural youth have the potential to thrive in agricultural entrepreneurship [1]. Embracing these opportunities can introduce innovative techniques, revitalize rural communities, and ensure a sustainable future led by a new generation of farmers. To tackle these challenges, promising solutions include enhancing access to essential resources like land, financing, technology, education, and markets through peer-to-peer training programs [2]. Additionally, advancing gender equality in the agricultural sector is crucial, as overcoming gender disparities will unlock new opportunities and drive inclusive growth.

1.2 Unlocking the potential of agriculture

Agricultural entrepreneurship offers a promising path to rural revitalization. By embracing innovation, value addition, and market-driven strategies, we can transform traditional farming practices into thriving enterprises. Supporting smallholder farmers and entrepreneurs empowers rural communities, fosters economic growth, and creates new opportunities for prosperity [3]. Moreover, agricultural innovation, particularly through sustainable practices, holds the key to increased productivity, enhanced crop quality, and strengthened food value chains [4].

This not only benefits farmers but also ensures wider access to nutritious food for all. Moreover, agricultural entrepreneurship is driven increasingly by smart technologies and climate-resilient practices. These innovations not only protect our environment but also enhance our ability to adapt to the changing climate [5]. To harness fully the potential of rural youth in agriculture, it is crucial to address social barriers, such as gender-based discrimination. Empowering rural women is key to unlocking their contributions to the sector [6].

1.3 The Power of peer learning

Van Ewijk et al., [7] emphasize that peer learning is an effective tool for building capacity in agricultural entrepreneurship. This approach allows rural youth to develop their skills by sharing knowledge and experiences with peers, enhancing individual growth and contributing to broader sustainable development goals [8]. By interacting with others facing similar challenges, participants gain valuable insights into the successes and failures of their peers. Peer learning effectively shares knowledge, builds trust, and fosters understanding of local contexts [9]. It also strengthens social bonds, boosts confidence, and develops leadership skills among rural youth [10]. Ultimately, this collaborative approach stimulates creativity and innovation in agricultural entrepreneurship by encouraging experimentation, knowledge sharing, and problem-solving [11]. Likewise, it provides a framework to support entrepreneurial ventures and agricultural activities.

1.4 The scene in Jordan

In Jordan, the type of agricultural production plays a crucial role in empowering rural youth through the adoption of sustainable innovation and technology [12]. Research by Tarawneh and Al-Najjar [13] underscores the importance of providing equitable loans and building capacity to encourage youth entrepreneurship in the agricultural sector. Additionally, Tarawneh et al., [14] emphasize the significance of collaboration between the government and non-governmental organizations in supporting young farmers. These studies illustrate that effective partnerships are essential for fostering youth empowerment in agriculture.

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1.5 Hypotheses and goals

This study hypothesizes that empowering rural youth through agricultural entrepreneurship, peer learning, and gender equality is crucial for achieving sustainable development. These approaches address traditional challenges, foster innovation, and promote sustainability in agriculture. Additionally, the transition from traditional farming to modern agricultural entrepreneurship relies on comprehensive policies, financial support, and capacity-building programs to ensure agriculture drives rural development. This research aims to empower rural youth through agricultural entrepreneurship, peer learning, and gender equality as key strategies for sustainable development.

2. METHODOLOGY

2.1 Design and sample

The study involved 54 participants (both men and women, aged 18-30) from rural areas in Jerash, Jordan, recruited through the Agricultural Extension Services Department. The participants had diverse educational backgrounds. They attended two 30-minute interactive sessions focused on topics like business planning, marketing, and sustainable farming. These sessions were facilitated by experienced agripreneurs. A pre-and post-session survey was administered to gather data on participants' knowledge, attitudes, and intentions toward agripreneurship. Both quantitative and qualitative data were collected through closed- and open-ended questions.

2.2 Session details

First session: The session introduced agripreneurship, with an emphasis on identifying business opportunities and understanding market dynamics. Afterward, a survey was conducted to measure changes in participants' knowledge and attitudes.

Second session: This session focused on financial management, risk assessment, and applied learning through case studies. A post-session survey was administered to evaluate participants' overall experience and the impact of the sessions on their attitudes and intentions.

2.3 Statistical Analyses

The study used various statistical techniques, including ANOVA, Chi-Square tests, regression analysis, and Pearson correlation performed using SAS [15], to analyze the survey data and evaluate the effect of the sessions on participants' knowledge and attitudes.

2.4 Ethics and limitations

The study maintained ethical standards by ensuring confidentiality and obtaining informed consent. Noted limitations included the small sample size, reliance on self-reported data, and the short duration of the sessions, which may have restricted the depth of learning.

3. RESULTS

Table (1) presents the participants' educational backgrounds, with most holding university degrees between 25 and 30 years old, and an almost equal gender distribution.

Table 1: Demographic breakdown of participants by education level, gender, and age

Demographic variable	High school	College/ university	Vocational training	Male	Female	Age/year 18-24	Age/year 25-30
Frequency	12	26	16	28	26	20	34
Percentage	-	-	-	51.9%	48.1%	-	-

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Table (2) shows a significant difference in pre-session knowledge scores across education levels, indicating that education has a strong impact on initial knowledge.

Table 2: Source of variation in pre-session knowledge scores across education levels (high school, college/university, vocational training)

Source of variation	Degrees of freedom	Mean square	p-value
Education levels	2	175.12	0.003
Error	51	23.54	

Table (3) indicates no significant association between education level and intentions to start an agricultural business, despite observed differences across education levels.

Table 3: Association between education level and intentions to start an agricultural business

Education level	Intentions to start business	No intentions to start business	Total
High school	5	7	12
College/ university	15	11	26
Vocational training	10	6	16
Total	30	24	54
Chi-square = 3.45; df = 2; p-value = 0.178.			

Table (4) shows that higher pre-session knowledge leads to more positive post-session attitudes toward agricultural entrepreneurship, while age had no significant effect. This suggests that boosting pre-session knowledge can effectively enhance attitudes.

Table 4: Impact of pre-session knowledge on post-session attitudes toward agricultural entrepreneurship

Variables	Beta coefficient	Standard error	p-value
Pre-session knowledge	0.62	0.15	0.001
Age	-0.08	0.06	0.186

Table (5) indicates a positive correlation between age and knowledge scores both before and after the session, with a stronger correlation observed for post-session knowledge. This suggests that older participants may experience greater knowledge gains, indicating that age could influence learning outcomes.

Table 5: Correlation of age with pre-session and post-session knowledge scores

Variable	Pre-session Knowledge	Post-session Knowledge
Age	0.23	0.36
p-value	0.073	0.012

Table (6) shows that males scored higher than females in post-session knowledge, suggesting that gender may influence knowledge acquisition and warrants further exploration in agricultural entrepreneurship training.

Table 6: Gender differences in post-session knowledge scores

Gender	Mean	Standard deviation	p-value
Male	32.56	5.23	0.018
Female	29.84	4.89	

The results reveal the powerful influence of education and gender on how knowledge is acquired while emphasizing that a strong foundation of pre-existing knowledge significantly shapes positive attitudes toward entrepreneurship.

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4. DISCUSSION

A balanced gender distribution (51.9% male, 48.1% female) and the concentration of participants aged 25-30 with university degrees highlight key demographic factors (Table 1), that must be considered when analyzing attitudes and knowledge in agribusiness. These variables, gender, age, and education, are not just descriptive statistics but crucial elements influencing how individuals engage with and respond to interventions. The inclusion of participants with diverse educational backgrounds, from secondary education to vocational training, further emphasizes the need for a comprehensive approach. As Kote et al., [16] and Geza et al., [17] argue, addressing challenges in agribusiness requires programs that consider the unique needs of different genders, ages, and educational levels. Failure to do so risks neglecting critical barriers to youth participation, such as the lack of entrepreneurial skills, making it essential that interventions are tailored to these demographic realities for effective outcomes.

The information in Table (2) demonstrates that individuals with university education possess significantly higher pre-session knowledge scores compared to those with only secondary education, underscoring that education level is a critical determinant of prior knowledge. This highlights the necessity for educational programs to be designed with diverse backgrounds in mind, ensuring that all participants can engage meaningfully and enhance their learning outcomes. Furthermore, Adeyanju et al., [18] emphasize the effectiveness of the Fadama program in empowering Nigerian youth through agriculture, suggesting that government investment in training and partnerships is essential for sustaining such initiatives. The influence of education and perception on participation cannot be overlooked; therefore, making agriculture appealing to young people is crucial. In this context, Magagula and Tsvakirai [19] advocate for promoting agricultural education, providing business support, and showcasing opportunities within the sector to motivate youth involvement. By addressing educational disparities and perceptions collectively, we can create a targeted approach that fosters greater engagement in agriculture among young individuals, ultimately enhancing their contributions to the sector.

Education level alone is not a significant predictor of intentions to start an agricultural business (Table 3); instead, socioeconomic context and personal experiences are more influential factors. Research by Purwaningsih et al., [20] identifies several critical elements that shape decisions to pursue agricultural entrepreneurship, including parental background, ethnicity, marital status, gender, age, and location. Similarly, Cheng et al., [21] concluded that while education does not serve as a primary influence, socioeconomic context and personal experiences play essential roles in entrepreneurial intentions. Understanding these dynamics is vital for developing effective strategies to support agricultural entrepreneurship and foster a more conducive environment for aspiring entrepreneurs in the agricultural sector. Enhancing pre-session knowledge is crucial for shaping positive post-session attitudes toward agricultural entrepreneurship. The strong positive correlation between pre-session knowledge and post-session attitudes (Table 4) underscores its significance. Bouichou et al., [22] further highlight pre-session knowledge as a key predictor of post-session attitudes, particularly for individuals with higher education levels. By prioritizing pre-session knowledge, training programs can more effectively foster entrepreneurial attitudes, driving greater success in agricultural entrepreneurship education. The moderate positive correlation between age and pre-session and post-session knowledge scores (Table 5) argues that older participants benefit more from learning due to their accumulated knowledge. This suggests that age significantly affects learning effectiveness, making it essential to design educational programs that address the specific needs of different age groups. While Zickafoose et al., [23] highlight gaps in training opportunities for rural youth, Vitung and Anu [24] point out barriers like limited access to land and financial resources, which hinder younger individuals' engagement in agriculture. Addressing these barriers, as Arafat et al., [25] suggest,

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requires fostering opportunity identification and building entrepreneurial networks for youth to enhance their participation in agribusiness. The information in Table (6) clearly indicate that male participants outperformed female participants in post-session knowledge scores, revealing significant gender disparities in training program effectiveness. This disparity necessitates the urgent redesign of training initiatives to address the unique needs and learning styles of both genders. Furthermore, incorporating qualitative research, as suggested by Henry et al., [26], is essential for exploring gender-specific experiences in entrepreneurship, which could lead to more tailored educational strategies. Additionally, Baliyan et al., [27] identify critical barriers, such as limited land access, intense competition, and insufficient capital, which influence attitudes toward entrepreneurship. To foster equitable opportunities for all genders, policy measures must focus on overcoming these obstacles.

4.1 Empowering entrepreneurs in agricultural projects

The findings decisively argue for a customized approach in educational and training programs for agricultural entrepreneurship, as they must address the diverse backgrounds and needs of participants [23]. With an even gender distribution and a significant portion of participants aged 25-30, it is imperative to consider gender-specific learning preferences and the unique challenges different age groups face [27]. Moreover, while education is essential for enhancing knowledge, it cannot be regarded as the sole determinant of entrepreneurial intentions; socioeconomic factors and personal experiences also significantly influence these intentions [2], [20]. Therefore, effective strategies must improve pre-session knowledge through experiential learning while simultaneously addressing broader socioeconomic conditions to promote equitable opportunities for all genders and age groups in agribusiness. Furthermore, the findings highlight the urgent need for policy changes to dismantle barriers such as limited access to resources and land, as failing to do so will perpetuate an exclusive and stagnant agricultural entrepreneurship environment. Ultimately, by adopting a holistic and inclusive framework, stakeholders can empower youth in agriculture, which is vital for ensuring a sustainable and prosperous future for the sector; this is not just an option but also a necessity for fostering growth and vitality in agricultural entrepreneurship.

4.2 Inclusive training and policy reforms

The analysis indicates that inclusive training and policy reforms are important for enhancing agricultural entrepreneurship among youth [22]. Although the gender distribution appears balanced, notable performance disparities in post-session knowledge tests suggest a need for targeted training that accommodates different learning styles and experiences, as observed by Van Ewijk et al., [7]. Additionally, the relationship between educational attainment and socioeconomic factors warrants further investigation to understand their combined effects on entrepreneurial intentions [20]. Consequently, future research should focus on integrating experiential learning into educational frameworks and proposing specific policy reforms to address barriers such as limited access to land and financial resources. This approach aims to empower diverse entrepreneurs and promote sustainable development in the agricultural sector.

5. CONCLUSION

This study underscores the importance of considering diverse educational backgrounds in future research on agricultural entrepreneurship. The correlation between higher education levels, pre-session knowledge, and positive post-session attitudes indicates that tailored educational programs can significantly improve learning outcomes and foster positive attitudes. Additionally, addressing gender disparities in training effectiveness highlights the necessity for inclusive program designs. The influence of socioeconomic context and personal experiences, alongside education, necessitates targeted interventions to address specific needs. Moreover, the positive relationship between age and

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knowledge calls for accommodating different age groups in educational initiatives. Ultimately, these findings advocate for holistic strategies and policy reforms that empower youth and promote equity in agricultural entrepreneurship.

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