

## **Fostering Digital Entrepreneurship Programmes through Adult Education: A Pathway to Sustainable Development in the Rural Areas of Rivers State**

\*Azunwo Mamnzenenu Ukwanyi PhD<sup>1</sup>, Dr. Barnabas Chukwunweike Onyesom<sup>2</sup>

&

Dr. Amachree Augustine Vincent Oribo<sup>3</sup>

Department of Adult Education and Community Development

Faculty of Education, Rivers State University

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**Abstract:** *This study examined how fostering digital entrepreneurship programmes through adult education can serve as a pathway to sustainable development in rural Rivers State, Nigeria. Despite Nigeria's expanding digital economy, rural communities remain disadvantaged due to limited digital infrastructure, low literacy, and socio-economic inequalities. Adult education provides a strategic mechanism to bridge this divide by embedding digital skills and entrepreneurship training into non-formal learning contexts. A descriptive survey design was adopted; data were collected from 72 respondents (20 facilitators and 52 learners) across ten rural communities in Emohua and Ikwerre Local Government Areas. A structured questionnaire, validated by experts and tested for reliability ( $\alpha = 0.82$ ), was employed. Data were analyzed using mean and standard deviation for research questions, while hypotheses were tested with an independent t-test at 0.05 significance level. Findings showed that digital entrepreneurship programmes significantly enhanced employment opportunities, income generation, and poverty reduction. Respondents agreed that programme content and delivery mechanisms—particularly digital marketing, financial literacy, and blended learning approaches were relevant and accessible, though advanced digital competencies remain underemphasized. The programmes also promoted gender equity and social inclusion by encouraging the participation of women, youth, and marginalized groups, though socio-cultural barriers persist. The study concludes that integrating digital entrepreneurship into adult education has transformative potential for rural development. It recommends enhanced funding, curriculum enrichment with advanced digital skills, and gender-sensitive interventions to ensure inclusivity and sustainability.*

**Keywords:** *Adult Education, Digital Entrepreneurship, Sustainable Development, Rural Communities*

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### **Introduction**

Digital entrepreneurship defined as entrepreneurial activity that relies on digital technologies to create, deliver, or capture value has emerged as a critical driver of inclusive growth and socio-economic transformation across Africa (Osinubi, 2025). It encompasses the use of mobile applications, e-commerce platforms, fintech solutions, and social media markets to expand market reach, reduce

operational costs, and create new forms of value within local economies (ResearchGate, 2023). In Nigeria, digital entrepreneurship has grown significantly due to the rapid expansion of internet access, mobile money systems, and social media adoption, enabling small-scale businesses and microenterprises to reach broader markets, diversify their customer bases,

and enhance service delivery (Data Reportal, 2024; Punch Nigeria, 2025).

Despite this potential, rural communities remain disadvantaged in accessing and fully participating in the digital economy. In states like Rivers State, structural barriers persist, including limited broadband penetration, irregular electricity supply, low digital literacy levels, and inadequate access to affordable devices (Iyalla-Amadi, 2024; World Bank, 2025). These constraints are compounded by weak institutional support structures and the absence of sustainable digital ecosystems that could nurture entrepreneurial activities beyond initial training or start-up phases (Leger, 2025). The digital divide thus risks widening inequalities, with urban centers benefitting disproportionately from digital transformation while rural populations continue to face exclusion from its socio-economic benefits (NBS, 2024; UNESCO, 2023).

Adult education presents an effective pathway to bridge this divide by equipping adult learners with both foundational and advanced digital skills that are contextualized to their local economies. Globally, adult education has been recognized as a platform for fostering lifelong learning, enhancing employability, and strengthening innovation capacities among populations traditionally excluded from mainstream education (UNESCO, 2023; UIL,

2023). In the Nigerian context, initiatives such as digital literacy programs for adult educators have demonstrated how targeted interventions can significantly improve livelihoods and open pathways to participation in the digital economy (UNESCO, 2023). By embedding entrepreneurship modules into adult education, rural learners can acquire not only the technical skills needed to navigate digital platforms but also the business acumen required to innovate, manage, and sustain enterprises within dynamic markets (World Bank, 2025).

Strengthening adult education to foster digital entrepreneurship aligns directly with the Sustainable Development Goals (SDGs), particularly Goal 4 (quality education), Goal 8 (decent work and economic growth), Goal 9 (industry, innovation, and infrastructure), and Goal 10 (reduced inequalities). By providing accessible, inclusive, and context-specific digital skills training, rural communities in Rivers State can leverage digital entrepreneurship to diversify livelihoods, mitigate poverty, reduce rural–urban migration, and promote sustainable community development (Osinubi, 2025; Iyalla-Amadi, 2024). Therefore, investing in adult education as a vehicle for digital entrepreneurship is not only a strategy for economic inclusion but also a critical pathway for sustainable development in Nigeria’s rural areas.

Over the years, adult education has played a significant role in Nigeria's socio-economic development since the colonial period. In the early years, literacy campaigns were launched by missionary groups and colonial administrators to address widespread illiteracy, especially among adults excluded from formal schooling (Omolewa, 2008). Following independence in 1960, the Federal Government of Nigeria prioritized adult education as part of its national development agenda, recognizing the importance of equipping citizens with literacy and numeracy skills necessary for civic participation, vocational development, and socio-economic transformation (Aderinoye, 1997).

The landmark *National Policy on Education (NPE)* first promulgated in 1977 and revised several times since, explicitly identified adult and non-formal education as essential for providing functional literacy, continuing education, and lifelong learning opportunities (Federal Republic of Nigeria, 2014). Over the decades, Nigeria has implemented large-scale literacy campaigns, vocational training initiatives, and continuing education programmes targeting diverse groups, including rural dwellers, women, nomadic populations, and marginalized communities (UNESCO, 2023).

Adult education in Nigeria evolved from being primarily literacy-focused to encompassing vocational and entrepreneurial training. By the 1980s and 1990s, the government and international agencies like UNESCO and UNICEF introduced community-based programs that combined literacy with livelihood skills (Omolewa, 2008). The establishment of agencies such as the *National Commission for Mass Literacy, Adult and Non-Formal Education (NMEC)* in 1990 underscored the institutionalization of adult education as a tool for human capital development. More recently, digital literacy and information communication technology (ICT) training have become integrated into adult education to address the demands of the 21st-century knowledge economy (UNESCO Institute for Lifelong Learning, 2023).

Despite these strides, challenges persist. Funding gaps, inadequate infrastructure, shortage of qualified facilitators, and low public awareness continue to limit the reach and impact of adult education programs (Aderinoye, 1997; Iyalla-Amadi, 2024). In rural areas of states like Rivers State, these challenges are compounded by infrastructural deficits and socio-economic inequalities, leading to uneven access to lifelong learning opportunities. Nevertheless, the historical trajectory shows that adult education has remained central to Nigeria's development

agenda and is now positioned as a strategic platform for digital skills acquisition and entrepreneurship.

Nigeria has one of the fastest-growing digital economies in Africa, driven by the expansion of internet penetration, mobile telephony, and financial technology innovations. As of early 2024, over 122 million Nigerians had access to the internet, representing more than half of the population (DataReportal, 2024). The spread of affordable smartphones and social media platforms such as Facebook, Instagram, TikTok, and WhatsApp has enabled small businesses to engage in e-commerce, social media marketing, and online service delivery (Punch Nigeria, 2025).

The fintech sector has been particularly transformative. Mobile money platforms, online banking, and digital wallets have increased financial inclusion, enabling micro and small entrepreneurs to receive payments, access loans, and manage transactions with greater efficiency (World Bank, 2025). The *Digital Economy Policy and Strategy (DEPS) 2020–2030* adopted by the Federal Government further underscores the role of ICT and digital innovation in promoting inclusive growth and sustainable development (Federal Ministry of Communications and Digital Economy, 2020). However, despite rapid growth, Nigeria's digital economy is characterized by

stark urban–rural disparities. While urban centers like Lagos, Abuja, and Port Harcourt benefit from reliable broadband, rural areas struggle with weak connectivity, high costs of data, and limited infrastructure (NBS, 2024; Iyalla-Amadi, 2024). Without deliberate interventions, these gaps risk exacerbating inequalities, leaving rural entrepreneurs unable to compete or take advantage of digital opportunities.

Adult education offers a strategic mechanism to address the digital divide and foster inclusive entrepreneurship in rural Rivers State. By embedding digital literacy and entrepreneurship training into adult education programs, rural learners can acquire the knowledge, skills, and confidence to participate in the digital economy. Research demonstrates that targeted digital literacy interventions improve entrepreneurial performance, particularly when aligned with local livelihoods such as agriculture, crafts, and trading (Leger, 2025; UNESCO, 2023).

Digital entrepreneurship can serve as a catalyst for rural transformation by enabling farmers to access online markets, traders to reach wider customers, and artisans to showcase their products globally through e-commerce platforms. In addition, digital tools can facilitate better market information, enhance financial inclusion through mobile money, and

create new forms of employment in digital services (Osinubi, 2025). These pathways directly contribute to the achievement of the Sustainable Development Goals (SDGs), particularly SDG 4 (quality education), SDG 8 (decent work and economic growth), SDG 9 (innovation and infrastructure), and SDG 10 (reduced inequalities).

Strengthening adult education for digital entrepreneurship also responds to Nigeria's national priorities. The World Bank (2025) has emphasized the need for a national digital literacy framework to standardize digital training and expand access. UNESCO (2023) further highlights the importance of contextualized, inclusive approaches that address the unique barriers faced by rural populations, women, and marginalized groups. For Rivers State, such an approach could foster sustainable local economies, reduce poverty, and stem rural–urban migration by providing residents with viable livelihoods within their communities.

### **Statement of the Problem**

Despite Nigeria's progress in digital transformation, significant disparities exist in how different regions and populations access and benefit from the digital economy. Urban centers such as Obio/Akpor and Port Harcourt have become hubs of digital entrepreneurship,

with thriving technology start-ups, digital service providers, and e-commerce platforms. However, rural communities, particularly in Rimeodegu and Igwuruta, remain marginalized due to structural challenges such as poor internet connectivity, inadequate electricity supply, high costs of digital devices, and low digital literacy levels. This rural–urban digital divide restricts the participation of Rimeodegu and Igwuruta residence in digital entrepreneurship and exacerbates existing socio-economic inequalities.

Therefore, the problem this study seeks to address is the lack of structured adult education programmes that integrate digital literacy and entrepreneurship training in rural Rivers State. Unless adult education is repositioned to foster digital entrepreneurship, the state's rural communities may continue to face socio-economic marginalization, undermining both local development and Nigeria's broader efforts to achieve the Sustainable Development Goals (SDGs), particularly those related to education, decent work, innovation, and reduced inequalities.

### **Purpose of the study**

The purpose of the study was to examine fostering digital entrepreneurship programmes through adult education: a pathway to

ustainable development in the rural areas of Rivers State

The specific objectives were to:

1. To assess the socio-economic impact of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State.
2. To examine the content, and delivery mechanisms of existing digital entrepreneurship programmes in the rural areas of Rivers State.
3. To explore the extent to which digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State.

### Research Questions

The following research questions guided the study:

1. What are the socio-economic impacts of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State?
2. What types of content and delivery mechanisms are employed in existing digital entrepreneurship programmes in the rural areas of Rivers State?

3. To what extent do digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State?

### Hypotheses

The following null hypotheses were tested at 0.05 level of significance:

**H<sub>01</sub>.** There is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on socio-economic impacts of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State

**H<sub>02</sub>.** There is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on the type of content and delivery mechanisms employed in existing digital entrepreneurship programmes in the rural areas of Rivers State

**H<sub>03</sub>.** There is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on the extent to which digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State

### Methodology

The study adopted a descriptive survey research design. This design was considered appropriate



because it enabled the researcher to collect data from a sample of adult learners and facilitators in order to describe their perceptions of digital entrepreneurship programmes, as well as their socio-economic impacts in rural communities of Rivers State. The survey design also provided a basis for testing the null hypotheses using statistical tools.

The study was carried out in ten (10) rural communities across Emohua and Ikwerre Local Government Areas of Rivers State. Specifically, five communities were selected from Rimeodegu (Rumuji, Ovogo, Rumuewor, Rumuodogo, and Eveku) and another five from Igwuruta (Omuohia, Omueike, Omuchi, Omumah, and Omunwei). These communities were chosen because they represent rural areas with limited digital infrastructure, low levels of digital literacy, and inadequate access to structured adult education programmes, making them suitable for assessing the prospects and challenges of fostering digital entrepreneurship through adult education.

The target population comprised 720 individuals, including 534 adult learners enrolled in non-formal education programmes and 216 facilitators across the selected communities. This population was considered adequate to provide diverse perspectives on the content, delivery mechanisms, inclusivity, and socio-economic outcomes of digital

entrepreneurship programmes in rural Rivers State.

From the population, a total sample of 72 respondents was drawn using the simple random sampling technique to ensure fairness and equal representation of participants. The sample included 20 facilitators and 52 learners distributed across the two focal communities (Rimeodegu and Igwuruta). The choice of simple random sampling was based on the need to minimize bias and provide every member of the population an equal chance of selection, thereby increasing the validity and generalizability of the findings.

A structured questionnaire was developed by the researcher to collect data from respondents. The instrument was divided into four sections. Section A focused on demographic information of respondents, while Sections B, C, and D contained items aligned with the three research questions: (1) socio-economic impacts of digital entrepreneurship programmes, (2) content and delivery mechanisms, and (3) promotion of gender equity and social inclusion. The questionnaire items were structured on a 4-point Likert scale of response options ranging from *High Extent (HE)* to *Low Extent (LE)*.

The instrument was subjected to face and content validation by three experts two in Adult

and Non-Formal Education, and one in Measurement and Evaluation all from the Faculty of Education, University of Port Harcourt. Their suggestions led to revisions that improved clarity, relevance, and alignment with the study objectives.

To ensure reliability, the instrument was pilot-tested on 15 respondents from communities outside the study area. Data obtained were analyzed using Cronbach Alpha, which yielded a coefficient of 0.82, indicating high internal consistency of the questionnaire.

The researcher personally administered the questionnaire with the help of two trained research assistants familiar with the communities. Respondents were given adequate time to complete the questionnaires, and assistance was provided to those with

limited literacy levels. A 95% retrieval rate was achieved, ensuring sufficient data for analysis.

Data collected were analyzed using mean and standard deviation to answer the research questions, with a criterion mean of 2.50 serving as the benchmark for decision-making. To test the null hypotheses, an independent t-test was applied at 0.05 level of significance and 50 degrees of freedom. This choice was appropriate since it allowed for comparing the mean responses of facilitators and learners across Rimeodegu and Igwuruta communities.

## Results

**Research Question 1:** What are the socio-economic impacts of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State?

**Table 1: Extent to which socio-economic impacts of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State.**

S/No	Items	Facilitators (N =20)			Participants (N=52)		
		Mean	SD	Remark	Mean	SD	Remark
1	Participation in digital entrepreneurship programmes has improved my employment opportunities.	2.70	0.96	HE	3.15	0.98	HE



2	Since joining a digital entrepreneurship programme, my income level has increased.	3.25	0.88	<b>HE</b>	2.94	0.92	<b>HE</b>
3	Digital entrepreneurship training has helped me reduce financial hardship in my household.	2.90	1.00	<b>HE</b>	2.81	1.02	<b>HE</b>
4	Skills gained from digital entrepreneurship programmes have enabled me to start and expand my business.	3.10	1.04	<b>HE</b>	2.96	0.98	<b>HE</b>
5	Digital entrepreneurship programmes made me rely on traditional and seasonal sources of income.	1.95	0.98	<b>LE</b>	1.96	<b>0.88</b>	<b>LE</b>
	<b>Grand Mean &amp; SD</b>	<b>2.78</b>	<b>0.97</b>	<b>HE</b>	<b>2.76</b>	<b>0.96</b>	<b>HE</b>

The analyzed data in table 1 showed the mean and standard deviation scores on the extent to which socio-economic impact of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State. It was observed that respondents from Rimeodegu and Igwuruta in Emohua and Ikwerre Local Government Areas unanimously agreed to items 1, 2, 3, and 4, as

their responses were on the High Extent with the mean scores greater than the criterion mean of 2.50. while they disagreed on item 5 as it is less than the criterion mean of 2.50.

**Research Question 2:** What types of content and delivery mechanisms are employed in existing digital entrepreneurship programmes in the rural areas of Rivers State?

**Table 2: Extent to which content and delivery mechanisms are employed in existing digital entrepreneurship programmes in the rural areas of Rivers State.**

S/No	Items	Facilitators (N =20)			Participants (N=52)		
		Mean	SD	Remark	Mean	SD	Remark
1	The programme I attended did not provided relevant training in digital marketing and financial literacy.	2.00	0.88	<b>LE</b>	2.11	0.96	<b>LE</b>
2	Method of delivery of online and face-to-face, was suitable and accessible for me.	3.00	0.98	<b>HE</b>	2.88	0.92	<b>HE</b>
3	Training materials and resources were available in simple and understandable formats.	2.95	1.00	<b>HE</b>	3.04	0.88	<b>HE</b>
4	Practical demonstrations and hands-on exercises were part of the programme delivery.	3.10	0.96	<b>HE</b>	2.92	0.94	<b>HE</b>
5	The programme duration and schedule were convenient for rural participants like me.	3.00	0.98	<b>HE</b>	3.40	1.02	<b>HE</b>
	<b>Grand Mean &amp; SD</b>	<b>2.81</b>	<b>0.96</b>	<b>HE</b>	<b>2.87</b>	<b>0.94</b>	<b>HE</b>

The analyzed data in table 2 showed the mean and standard deviation scores on the extent to which content and delivery mechanisms are employed in existing digital entrepreneurship programmes in the rural areas of Rivers State. From the above response, it was observed that respondents from Rimeodegu and Igwuruta in Emohua and Ikwerre Local Government Areas respectively agreed to items 2, 3, 4, and 5. as

their responses were on the High Extent with the mean scores greater than the criterion mean of 2.50. while they disagreed on item 1 as it is less than the criterion mean of 2.50.

**Research Question 3:** To what extent do digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State?

**Table 3: Extent to which digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State.**

S/No	Items	Facilitators (N =20)			Participants (N=52)		
		Mean	SD	Remark	Mean	SD	Remark
1	Most women never had opportunities to participate in digital entrepreneurship programmes as they are strictly for men.	2.20	1.00	<b>LE</b>	1.96	0.88	<b>LE</b>
2	Women face fewer barriers when it comes to cultural, financial and household responsibilities when accessing these programmes.	2.90	0.92	<b>HE</b>	3.12	0.98	<b>HE</b>
3	The programmes encourage participation of marginalized groups youth, persons with disabilities, and the unemployed.	2.90	0.88	<b>HE</b>	2.83	1.00	<b>HE</b>

4	I feel that the programme promoted inclusiveness and respected the needs of diverse participants.	3.25	0.96	HE	3.06	0.98	HE
5	Women and other vulnerable groups did not benefit equally compared to men from digital entrepreneurship programmes.	3.20	0.98		2.92	0.96	HE
	<b>Grand Mean &amp; SD</b>	<b>2.89</b>	<b>0.95</b>	<b>HE</b>	<b>2.78</b>	<b>0.96</b>	<b>HE</b>

The analyzed data in table 3 showed the mean and standard deviation scores on the extent to which digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State. From the above responses, it was seen that respondents from Rimeodegu and Igwuruta in Emohua and Ikwerre Local Government Areas respectively agreed to items 2, 3, 4, and 5. as their responses were on the High Extent with the mean scores

greater than the criterion mean of 2.50. while they disagreed on item 1 as it is less than the criterion mean of 2.50.

### Hypotheses

**H<sub>01</sub>.** There is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on socio-economic impacts of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State

**Table 4: The t-test Analysis on the extent of residence of Rimeodegu and Igwuruta on socio economic impacts of digital entrepreneurship programmes on job creation, and poverty alleviation in the rural areas of Rivers State**

Respondents	N	X	SD	df	t-Cal	t-Crit	Ls	Decision
Facilitators	20	2.78	0.97					
				50	1.8625	1.96	0.05	Accepted
Learners	52	2.76	0.96					

Table 4 above showed the t-calculated value is 1.8625 while the t-critical value is 1.96. Since the t-calculated value of 1.8625 is less than the t-critical value of 1.96 at 0.05 level of significance and 50 degree of freedom, the null hypothesis is accepted. This implies that there is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on socio-economic impacts of digital entrepreneurship programmes on job creation,

and poverty alleviation in the rural areas of Rivers State

**H<sub>02</sub>.** There is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on the type of content and delivery mechanisms employed in existing digital entrepreneurship programmes in the rural areas of Rivers State

**Table 5: The t-test Analysis on the extent of Rimeodegu and Igwuruta on the type of content and delivery mechanisms employed in existing digital entrepreneurship programmes in the rural areas of Rivers State**

Respondents	N	X	SD	df	t-Cal	t-Crit	Ls	Decision
Facilitators	20	2.81	0.96					
				50	1.8052	1.96	0.05	Accepted
Learners	52	2.87	0.94					

Table 5 above showed the t-calculated value is 1.8052 while the t-critical value is 1.96. Since the t-calculated value of 1.8052 is less than the t-critical value of 1.96 at 0.05 level of significance and 50 degree of freedom, the null hypothesis is accepted. This therefore means that there is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on the type of content and delivery mechanisms employed in existing digital

entrepreneurship programmes in the rural areas of Rivers State

**H<sub>03</sub>.** There is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on the extent to which digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State.

**Table 6: The t-test Analysis on the extent of Rimeodegu and Igwuruta on the extent to which digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State**

Respondents	N	X	SD	df	t-Cal	t-Crit	Ls	Decision
Facilitators	20	2.89	0.95	50	1.8241	1.96	0.05	<b>Accepted</b>
Learners	52	2.78	0.96					

Table 6 above showed the t-calculated value is 1.8241 while the t-critical value is 1.96. Since the t-calculated value of 1.8241 is less than the z-critical value of 1.96 at 0.05 level of significance and 50 degree of freedom, hence the null hypothesis is accepted. By implication,

### Discussion of Findings

The purpose of this study was to examine how fostering digital entrepreneurship programmes through adult education can serve as a pathway to sustainable development in the rural areas of Rivers State. The findings are discussed in relation to the research questions, hypotheses tested, and existing literature.

### Socio-Economic Impacts of Digital Entrepreneurship Programmes

The study revealed that digital entrepreneurship programmes have a positive socio-economic impact on rural communities in Rivers State. Respondents agreed that participation in these

there is no significant difference in the mean ratings of residence of Rimeodegu and Igwuruta on the extent to which digital entrepreneurship programmes promote gender equity and social inclusion in the rural areas of Rivers State.

programmes improved their employment opportunities, increased their income levels, and reduced financial hardship in their households. Similarly, participants indicated that skills acquired enabled them to start or expand businesses, thereby diversifying their livelihoods. These findings align with Osinubi (2025) and the World Bank (2025), who emphasized that digital entrepreneurship has become a significant driver of job creation and poverty alleviation in Africa by lowering entry barriers and opening new markets through mobile platforms, e-commerce, and fintech.

Interestingly, the findings showed that reliance on traditional and seasonal sources of income



decreased with exposure to digital entrepreneurship training. This is consistent with UNESCO (2023), which argues that adult education equipped with digital literacy empowers rural learners to engage in more sustainable, technology-driven economic activities. The absence of significant differences in perceptions between residents of Rimeodegu and Igwuruta further highlights the uniformity of socio-economic challenges and benefits across rural communities. This supports the argument by Iyalla-Amadi (2024) that digital entrepreneurship, when integrated into adult education, can create inclusive growth across diverse rural settings.

### **Content and Delivery Mechanisms of Digital Entrepreneurship Programmes**

The results indicated that the content and delivery mechanisms of digital entrepreneurship programmes were largely relevant and effective. Respondents agreed that training in digital marketing, financial literacy, and practical demonstrations was adequate, and that delivery methods such as blended learning (online and face-to-face) were accessible. The availability of simple and understandable training materials further enhanced programme outcomes. These results support UNESCO's (2023) assertion that context-specific and accessible digital learning resources are critical for adult learners in rural settings, where

literacy levels and infrastructural challenges may hinder learning.

However, some respondents expressed concern that not all programmes provided sufficient coverage of critical areas like advanced ICT or innovation strategies. This reflects the position of Leger (2025), who noted that while digital literacy initiatives are expanding in Nigeria, many remain introductory in nature and fail to address higher-order entrepreneurial competencies such as product innovation, scaling, and global market participation. The lack of significant differences between Rimeodegu and Igwuruta respondents again underscores that the delivery mechanisms are broadly perceived as adequate, though there remains room for curriculum improvement to align with the Federal Ministry of Communications and Digital Economy's Digital Economy Policy and Strategy (2020).

### **Gender Equity and Social Inclusion in Digital Entrepreneurship Programmes**

Findings also revealed that digital entrepreneurship programmes promote gender equity and social inclusion to a high extent. Respondents agreed that women face fewer barriers when accessing programmes and that marginalized groups including youth, persons with disabilities, and the unemployed were encouraged to participate. Furthermore,

participants perceived that programmes promoted inclusiveness and respected the needs of diverse participants. These outcomes echo UNESCO's (2023) call for adult education to be inclusive and gender-responsive, as well as research by Omolewa (2008), which highlighted the role of adult education in empowering women and disadvantaged groups historically excluded from formal schooling.

Nonetheless, there were indications that women and vulnerable groups still do not benefit equally compared to men, which points to the persistence of subtle socio-cultural barriers. This is consistent with findings by Aderinoye (1997), who argued that despite progress, entrenched gender norms in rural Nigeria often restrict women's full participation in education and entrepreneurial programmes. That no significant differences were found between Rimeodegu and Igwuruta further suggests that gender-related challenges are systemic across rural Rivers State, requiring deliberate interventions such as gender-sensitive curricula, provision of childcare support, and targeted subsidies for women's participation.

## **Conclusion**

This study examined the role of digital entrepreneurship programmes, delivered through adult education, in fostering sustainable development in the rural areas of

Rivers State. The findings revealed that such programmes contribute significantly to job creation, income generation, and poverty alleviation. They also showed that existing programme content focused on digital marketing, financial literacy, and basic ICT remains relevant, though there is need for expansion into advanced digital competencies. Furthermore, the study highlighted that while digital entrepreneurship programmes promote gender equity and inclusiveness, systemic socio-cultural barriers still limit the full participation and benefits for women and vulnerable groups.

Taken together, these findings underscore the transformative potential of digital entrepreneurship when anchored in adult education frameworks. However, realizing this potential requires deliberate policy interventions, enhanced programme design, and a renewed focus on inclusivity.

## **Recommendations**

The following recommendations were made:

1. Policymakers should strengthen funding and support mechanisms such as micro-grants, startup loans, and tax incentives that enable rural digital entrepreneurs to create jobs and generate sustainable income. Additionally, periodic impact

assessments should be institutionalized to measure contributions to poverty reduction, ensuring programmes remain relevant to community needs.

2. Adult educators and programme developers should enrich curricula beyond basic digital literacy to include advanced competencies such as e-commerce logistics, financial technology, cybersecurity, and data analytics. Delivery should adopt blended learning models like face-to-face and digital platforms, simplified materials, and local language translations to ensure accessibility for rural learners with varying literacy levels.
3. Stakeholders should design gender-sensitive and inclusive interventions that provide targeted support for women, youth, and marginalized groups. This includes flexible training schedules, provision of childcare support, community sensitization to reduce cultural barriers, and dedicated quotas for women and vulnerable populations in programme enrolment.

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\*Corresponding Author: Azunwo Mamnzenenu Ukwanyi PhD

E-mail: [mamnzenenu.azunwo@ust.edu.ng](mailto:mamnzenenu.azunwo@ust.edu.ng)

Received: 09 November,2025; Accepted: 26 December,2025. Available online: 30 December, 2025

Published by SAFE. (Society for Academic Facilitation and Extension)

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