

# The Impact of Digital Literacy on Entrepreneurial Decision-making among Young Farmers

Zhuangzhuang Yin, Hao Chen, Chengwu Wang, Lu Wang\*

School of Public Administration, Xinjiang Agricultural University, Urumqi 830052, Xinjiang, China

\*Corresponding author E-mail addresses: 26721281@qq.com

## Abstract

Under the background of deep integration of digital economy and rural revitalization strategy, young farmers' entrepreneurship has become a new driving force for county economic development, and digital literacy is a key enabling factor. Based on the data of China Family Panel Survey (CFPS) in 2020-2022, this paper takes young rural households aged 18-45 as the research object, constructs a digital literacy index system covering six dimensions such as digital foundation, entertainment and shopping, and uses Probit model and instrumental variable method to empirically test the impact, mechanism and heterogeneity of digital literacy on young farmers' entrepreneurial decision-making. The purpose of this study is to reveal the internal logic of digital literacy affecting young farmers' entrepreneurial decision-making, and to provide empirical basis and policy reference for building a support system for young farmers' digital entrepreneurship and promoting rural revitalization.

## Keywords

Digital Literacy; Young Farmers; Entrepreneurial Decision; Mechanism Analysis; Heterogeneity.

## 1. Introduction

Revitalizing rural areas is an essential undertaking for the ongoing process of development transformation. In November 2016, a set of guidelines was introduced to support rural residents in pursuing entrepreneurial activities by using e-commerce platforms and applying an "Internet +" initiative in agriculture. These guidelines encouraged farmers to utilize advanced information technologies-such as big data, the Internet of Things, and cloud computing-to facilitate innovation and business creation. This idea was subsequently reinforced in a later blueprint for the 2021-2025 period, which stated the objective of comprehensively advancing rural revitalization. Within this context, the development of digital villages was treated as a key pathway, along with a requirement to raise the digital literacy of rural populations to meet the evolving trends of the digital era. According to data released in 2024 by a specialized agricultural statistics unit, the number of rural entrepreneurs nationwide had surpassed 12 million. Most of these individuals operate through e-commerce platforms and are engaged in emerging sectors such as online agricultural retail and rural tourism, thereby contributing notably to rural revitalization. Nonetheless, challenges remain, including insufficient coverage of digital literacy training and marked regional disparities in digital infrastructure. A 2024 report on digital literacy and skill development indicated that 50.57% of rural adults possessed basic or higher levels of digital literacy and skills, while only 9.53% achieved an advanced level-revealing a considerable gap relative to their urban counterparts. Resolving the structural tension between digital literacy and farmers' entrepreneurial decision-making has thus become a critical issue for advancing rural revitalization.

At the academic level, this trend is highly aligned with the theoretical forefront of 'digital entrepreneurship'. Digital technology is regarded as the core force that reshapes the entrepreneurial process and lowers the threshold for entrepreneurship. Entrepreneurs can enhance their digital literacy, which refers to their ability to confidently and critically use information and communication technologies in a digital environment. This enables them to more effectively identify and utilize new opportunities brought about by digital empowerment, thereby optimizing entrepreneurial decisions and improving entrepreneurial performance. However, beneath the surface of vigorous development, deep-seated structural contradictions are becoming increasingly prominent. The reality in China is that the urban-rural digital divide is still significant, which is essentially a "second level digital divide" in terms of digital skills and usage. According to the "Survey Report on National Digital Literacy and Skill Development Level (2024)", the digital literacy level of rural adults, especially in advanced skills, is far lower than that of urban residents. There is a structural tension between the widespread "digital literacy deficit" and the "digital capability requirements" required for entrepreneurship. Although international research has shown that in developing countries, the entrepreneurial value of digital technology is highly dependent on the absorptive capacity of the subject [1], this process faces unique challenges among young farmers in China. Their entrepreneurial decisions are not only constrained by individual digital abilities, but also deeply influenced by complex contextual factors such as family resources, social networks, and regional digital infrastructure. Although scholars have begun to pay attention to this issue and have confirmed the positive role of digital literacy in Chinese farmers' entrepreneurship [2], there are still two shortcomings in existing research: firstly, most studies have not accurately focused on young farmers, who are the most entrepreneurial and highly accepting key group of digital technology; Secondly, there is insufficient exploration of the influencing mechanism, lacking analysis of the mediating mechanism of the impact of digital literacy on income [3], and insufficient examination of the possible interaction between situational factors such as social networks and digital literacy [4].

## 2. Theoretical Analysis and Research Hypotheses

### 2.1. The Direct Effect of Digital Literacy on Entrepreneurial Decisions of Young Farmers

Against the backdrop of the integration of the Digital China strategy and the rural revitalization strategy, young farmers' entrepreneurship has gradually become a new driving force for promoting county-level economic development, and digital literacy is seen as a key individual capital to stimulate this driving force [5]. Firstly, under the traditional model, the entrepreneurial decisions of young farmers are not only limited by the narrow geographical and information space, but also deeply constrained by their individual and family characteristics such as age and family size. This phenomenon is closely related to the resource endowment theory and risk-taking perspective in entrepreneurship research. Specifically, age differences directly affect the risk preferences and learning abilities of young farmers.

The life cycle theory suggests that compared to older farmers, young entrepreneurs typically exhibit a higher willingness to take risks [6], but may also face a higher risk of failure due to a lack of experience. As a key structural factor, family size has a dual impact: on the one hand, a larger family size may mean a broader social network and labor resources, providing potential support for entrepreneurship [7]; On the other hand, it also means a heavier burden of family support and economic pressure, which significantly strengthens individuals' risk aversion tendencies and inhibits them from engaging in high-risk, high innovation entrepreneurial activities. Under the constraints of the aforementioned structural factors, young farmers who lack digital empowerment are often "locked" into limited information and resource circles, and

their entrepreneurial decisions are often limited to low-risk, high competition traditional "survival oriented" projects. Digital literacy breaks this dilemma through a triple mechanism: firstly, it reduces the cost of information acquisition [8], broadens the information boundaries of farmers, enables them to identify emerging market opportunities across regions, and alleviates the information resource paradox [9]; Secondly, it enhances farmers' self-efficacy towards digital tools [10], effectively reduces their perceived entrepreneurial risks, and strengthens their ability to put their ideas into practice [11]; Ultimately, with the dual empowerment of information and confidence, digital literacy reshapes the entrepreneurial cognitive framework of farmers, driving their decision-making logic from passive risk avoidance to active opportunity recognition [12], thus achieving a fundamental transition from "survival oriented" to "development oriented" entrepreneurship. In summary, this article proposes.

Assumption 1: The digital literacy level of young farmers has a significant positive promoting effect on entrepreneurial decision-making

Assumption 1a: Age plays a moderating role in the relationship between digital literacy and entrepreneurial decision-making, exhibiting an inverted U-shaped characteristic

Assumption 1b: Family size plays a positive moderating role in the relationship between digital literacy and entrepreneurial decision-making

## **2.2. Indirect Effects of Digital Literacy on Entrepreneurial Decisions of Young Farmers**

Based on the resource-based view and entrepreneurial process theory, this article proposes that digital literacy, as a key micro personal resource, can systematically influence the entrepreneurial decisions of young farmers through two core dimensions: "alleviating resource constraints" and "enhancing risk response". Specifically, its mechanism of action focuses on the following three paths: firstly, digital literacy enhances information transparency and credit visibility, broadens channels for obtaining formal credit, and directly alleviates the financial resource constraints faced by entrepreneurship, which is in line with the core argument of the resource-based view that resource acquisition is a source of competitive advantage [13]. Secondly, digital literacy promotes the use of digital inclusive finance and the accumulation of online social capital, effectively improving the living security level of families and building an economic "safety net" for entrepreneurs to cope with potential failures, thereby enhancing their willingness to take on entrepreneurial risks. This calls for the theory that risk-taking is the core link in the entrepreneurial process [14]. Thirdly, digital literacy strengthens the connection and participation of farmers in the digital society, deepens their social embeddedness, and enables them to obtain market information and tacit knowledge from a broader social network. This not only supplements their resource base, but also enhances their ability to identify and evaluate entrepreneurial opportunities, which is in line with the classic theory that social embeddedness affects entrepreneurial behavior. Therefore, hypothesis 2 is proposed.

Assumption 2: The acquisition of formal credit, the level of living security, and the degree of social embedding are important transmission pathways through which digital literacy affects young farmers

## **2.3. Heterogeneous Effects of Digital Literacy on Entrepreneurial Decision-making among Young Farmers**

Digital literacy, as an emerging human capital, has a profound and complex impact on the entrepreneurial decisions of young farmers. The effect of digital literacy varies significantly among different groups. This article constructs an analytical framework from three dimensions: regional differentiation, gender characteristics, and income heterogeneity. Firstly, in the well-equipped eastern region, the digital literacy of young farmers can give rise to advanced

entrepreneurial forms such as e-commerce and smart agriculture. In the central and western regions as well as remote mountainous areas, limited by the internet and market, the same skills often become auxiliary tools for information acquisition and traditional sales, and the entrepreneurial driving effect is significantly weaker [15]. Secondly, digital literacy provides technological empowerment for young men to optimize traditional agricultural production. And digital literacy has opened up a low threshold online entrepreneurial path for young women, thereby reshaping the gender pattern of rural entrepreneurship [16]. Finally, digital literacy can effectively alleviate the multiple resource constraints faced by low-income rural youth, such as funding, information, and social resources, thereby improving the entrepreneurial decision-making of low-income young farmers [17]. Based on this, the following hypothesis is proposed:

Assumption 3: Digital literacy has significant regional heterogeneity, gender heterogeneity, and income heterogeneity in the entrepreneurial decision-making of young farmers

Assumption 3a: The promotion effect of digital literacy on rural female youth entrepreneurship is significantly stronger than that of men

Assumption 3b: The incentive effect of digital literacy on entrepreneurship among low-income young farmers is significantly higher than that of high-income groups

### 3. Research Design

#### 3.1. Variable Selection

##### 3.1.1. Explained Variable

The dependent variable of this article is entrepreneurial decision-making (Cre), which is a binary variable. Following the approach of BLOCK J and SANDNER P (2009) [18], the question "Do any family members in your household engage in individual business or start a private enterprise?" from the CFPS database is used to measure farmers' entrepreneurial decisions. Yes takes the value 1, no takes the value 0.

##### 3.1.2. Explanatory Variables

The explanatory variable of this article is the digital literacy of young farmers (Szsy). This article defines farmers aged 18-45 as young farmers. Referring to the practice of LIS (2025) [19], as shown in Table 1, we first measure the comprehensive level of digital literacy in combination with the 11 items on Internet use behavior and attitude in the CFPS questionnaire. Among them, digital basic literacy refers to the accessibility of digital devices for young farmers. This article measures it from two aspects: whether young farmers have mobile internet access and whether they have computer internet access; Digital entertainment literacy refers to the behavior of young farmers using digital devices for entertainment. This article measures whether young farmers play online games and their perception of the importance of the internet for leisure and entertainment; Digital shopping literacy refers to the behavior of young farmers using digital devices to purchase daily necessities. This article measures whether young farmers shop online and the degree to which they consider the importance of the internet to their daily lives; Digital leisure literacy to young farmers using digital devices for leisure activities The behavior of relaxing through movement is measured in this article by whether young farmers watch short videos; Digital learning literacy refers to the behavior of young farmers using digital devices for learning. This article measures two items: whether young farmers learn online and their perception of the importance of the internet for learning; Digital communication literacy refers to the behavior of young farmers using digital devices to communicate with others. This article measures whether young farmers use WeChat and the importance of maintaining contact with family and friends through the internet. Subsequently, factor analysis was used for dimensionality reduction to synthesize a comprehensive digital literacy index. The key

indicators of factor analysis show that the KMO value is 0.769 and the Bartlett sphericity test chi square value is 10499.1 (with 55 degrees of freedom), both of which are significant at the 1% level, indicating strong correlation between items and making them very suitable for factor analysis. The cumulative variance contribution rate of the extracted common factors reached 56.65%, which can reflect the original information well.

**Table 1.** Index System for Measuring Digital Literacy

	Dimension	Question items	Eigenvalue	Variance %	Cumulative %
Digital literacy	Digital Basic Literacy	Is it mobile internet access	2.707	1.297	0.246
		Is the computer connected to the internet	1.410	0.302	0.374
	Digital entertainment literacy	Do you play online games	1.108	0.101	0.475
		The Importance of the Internet in Leisure and Entertainment	1.007	0.021	0.567
	Digital shopping literacy	Whether to shop online or not	0.986	0.181	0.656
		The Importance of the Internet in Daily Life	0.805	0.085	0.729
	Digital leisure literacy	Do you want to watch short videos	0.721	0.104	0.795
	Digital learning literacy	Is it online learning	0.616	0.027	0.851
		The Importance of the Internet in Learning	0.590	0.028	0.905
	Digital communication literacy	Do you use WeChat	0.562	0.073	0.956
		The importance of staying in touch with family and friends through the internet	0.489	.	1.000
			KMO	0.769	
		$\chi^2$	10499.1		
		df	55		

Note: KMO = Kaiser-Meyer-Olkin measure of sampling adequacy.  $\chi^2$  and df are from Bartlett's test of sphericity. All tests are significant at the 1% level.

**3.1.3. Mechanism Variables**

The mechanism variables in this article are access to formal credit (Bcs), level of living security (SD), and degree of social embeddedness (Rq). The reference method is to measure each mechanism variable from the relevant items of the CFPS questionnaire. Measure whether there are bank loan items in the questionnaire for obtaining formal credit. The level of living security is measured by selecting the number of items such as pension insurance, unemployment insurance, medical insurance, etc. in the questionnaire. The degree of social embeddedness is measured by selecting cash gift expenditures from the questionnaire and taking the logarithm.

**3.1.4. Control Variables**

Learn from the practices of WANG S and QU C (2025) [20]. Select two levels of individuals and families, and add control variables at the regional level. The control variables specifically include age, gender, years of education, health status, marital status, political affiliation, household registration type, family size, elderly dependency ratio, per capita net income, and regional per capita GDP to control for individual heterogeneity and the impact of socio-economic environment.

### 3.1.5. Data Sources

This article selects data from the China Family Panel Studies (CFPS) conducted by the China Social Science Survey Center at Peking University from 2020 to 2022. This survey covers the whole country and has strong sample representativeness, providing a high-quality micro data foundation for this study. Based on the research objectives, we limited the sample to young rural registered residence farmers aged between 18 and 45 years old. After eliminating the missing observations of key variables, we finally obtained 3428 valid samples.

**Table 2.** Descriptive Statistics

Type	Variable	Abbr.	N	Mean	Std. dev.	Min	Max
Dependent	Entrepreneurial decision-making	<i>Cre</i>	3428	0.095	0.293	0	1
Explanatory	Digital literacy	<i>Szsy</i>	3428	0.48	0.128	0.141	0.739
	Obtaining formal credit	<i>Bcs</i>	3428	0.157	0.364	0	1
Mechanism	Living security level	<i>SD</i>	3428	1.541	0.812	0	3
	Degree of social embeddedness	<i>Rq</i>	3428	7.168	2.368	0	11.695
Individual controls	age	<i>Age</i>	3428	31.203	7.505	18	45
	Age squared	<i>Age2</i>	3428	10.299	4.729	3.24	20.25
	Gender	<i>Gen</i>	3428	0.515	0.5	0	1
	Educational attainment	<i>Edu</i>	3428	10.44	3.463	0	22
	Health condition	<i>Heal</i>	3428	3.454	1.054	1	5
	Marital status	<i>Marr</i>	3428	0.686	0.464	0	1
	Political status	<i>Party</i>	3428	0.019	0.135	0	1
Family controls	Household registration type	<i>Hukou</i>	3428	0.938	0.242	0	1
	Family size	<i>Fml</i>	3428	4.912	2.02	1	14
	Old-age Dependency ratio	<i>elder p</i>	3428	0.182	0.319	0	3
Regional controls	Family net income	<i>Lnfin p</i>	3428	9.691	0.789	7.601	11.797
	Regional per capita GDP	<i>PGDP</i>	3428	10.903	0.318	10.487	11.963

Note: Standard deviations are reported in the "Std. dev." column. All variables are defined in the main text. \*\*\*  $p < 0.01$ , \*\*  $p < 0.05$ , \*  $p < 0.1$  (if applicable).

## 4. Model Setting

### 4.1. Benchmark Regression Model

Given that the decision variable of "whether young farmers choose to start businesses" is a dummy variable and its distribution satisfies the standard normal distribution assumption, this study uses a binary Probit model to estimate the impact of digital literacy on their entrepreneurial decisions. The specific model settings are as follows:

$$Cre_i^* = \beta_0 + \beta_1 Szsy + \sum \beta_2 z_i + \varepsilon_i \tag{1}$$

$$Cre_i^* = \begin{cases} Cre_i \leq 0 \\ Cre_i > 0 \end{cases} \tag{2}$$

Among them,  $Cre_i$  represents the entrepreneurial decision of young farmers,  $Cre_i^*$  represents the latent variable, when  $Cre_i$  greater than 0, it is 1, otherwise it is 0;  $Szsy_i$  represents the digital literacy of young farmers;  $Z_i$  represents control variables;  $\beta_0$  represents the intercept constant term;  $\beta_1$  and  $\beta_2$  represent the estimated coefficients of farmers' digital literacy and control variables respectively;  $\varepsilon_i$  represents a random error term.

#### 4.2. Mechanism Regression Model

This study adopts the classic "two-step method" to empirically test the transmission mechanism of the influence of digital literacy on young farmers' entrepreneurial decisions. Constructed corresponding models:

The first step is to explore the impact of digital literacy on mechanism variables and test whether digital literacy has improved each mechanism variable. The model is constructed as follows:

$$M_i = a_0 + a_1 Szsy + \sum \delta z_i + \mu_i \quad (3)$$

Among them,  $M_i$  represent the various mechanism variables, namely formal credit access (Bcs), standard of living (SD), and social embedding results (Rq).  $a_0$  represents the cross-sectional constant term,  $a_1$  represents the coefficient to be estimated for digital literacy,  $z_i$  represents other control variables, and  $\mu_i$  represents the random error term.

The second step is to examine the mediating role of mechanism variables in the entrepreneurial decision-making model. Based on confirming that digital literacy can effectively improve mechanism variables, we examine whether the direct effects of digital literacy are "absorbed" or "weakened" by the introduction of mediating variables. The model is constructed as follows:

$$Cre_i^* = y_0 + y_1 Szsy + \sum \chi M_i + \sum \theta z_i + \varepsilon_i \quad (4)$$

Among them,  $y_0$  represents the cross-sectional conventional term,  $y_1$  represents the estimated coefficient of digital literacy,  $\chi$  represents the estimated coefficient of each mechanism variable, and  $\theta$  represents the estimated coefficient of the control variable.

## 5. Experimental Results and Analysis

### 5.1. Benchmark Regression

As shown in Table 3, the benchmark regression of digital literacy on entrepreneurial decision-making of young farmers. Columns (1) to (4) demonstrate the robustness of the results by gradually incorporating individual control variables, household control variables, and regional control variables. indicating that digital literacy, as a new type of human capital in the digital age, can effectively empower young farmers, enhance their ability to grasp market opportunities and integrate entrepreneurial resources, thereby significantly increasing their likelihood of choosing entrepreneurship. In summary, hypothesis 1 holds true.

Columns (2) to (4) show that individual and family characteristics have a systematic impact on entrepreneurial decision-making. There is an inverted U-shaped relationship between age and entrepreneurship, which conforms to the evolution law of resource accumulation and risk

preference in the life cycle theory, that is, entrepreneurial willingness first increases and then decreases as the life cycle progresses, reflecting the dynamic balance between individual resource accumulation in youth, peak ability in middle age, and risk avoidance in old age. Assuming 1a holds true. Gender and marital status both have a significant promoting effect on entrepreneurship, reflecting the key support provided by traditional family role division and social capital in the entrepreneurial process. Family size also shows a significant positive impact, indicating that the potential labor resources and internal risk sharing mechanisms contained in larger families provide important guarantees for entrepreneurial activities. Assuming 1b holds true. However, personal control variables such as education level and health status are not significant, indicating that the functions of the digital age may be partially mediated or replaced by digital literacy. The results indicate that entrepreneurial decisions are constrained by micro social structures and highlight the key role of digital literacy in reconstructing farmers' entrepreneurial motivation.

**Table 3. Benchmark Regression**

			(1)	(2)	(3)	(4)
			<b>Entrepreneurial decision-making (cre)</b>			
Digital literacy		Szsy	0.608*** (2.58)	1.051*** (3.95)	1.027*** (3.84)	1.027*** (3.84)
Individual controlled	age	Age		0.139*** (3.04)	0.129*** (2.80)	0.129*** (2.80)
	Age squared	Age2		-0.171** (-2.51)	-0.152** (-2.20)	-0.152** (-2.20)
	Gender	Gen		0.170*** (2.64)	0.165** (2.57)	0.165** (2.57)
	Educational attainment	Edu		0.006 (0.51)	0.005 (0.43)	0.005 (0.43)
	Health condition	Heal		-0.015 (-0.50)	-0.016 (-0.54)	-0.016 (-0.54)
	Marital status	Marr		0.264*** (2.67)	0.219** (2.14)	0.219** (2.14)
	Political status	Party		-0.213 (-0.81)	-0.220 (-0.83)	-0.220 (-0.83)
	Household registration type	Hukou		0.010 (0.07)	0.019 (0.14)	0.019 (0.14)
Family controlled	Family size	Fml			0.027 (1.54)	0.027 (1.54)
	Old-age Dependency ratio	elder_p			-0.132 (-1.19)	-0.132 (-1.19)
	Family net income	Lnfin_p			0.038 (0.81)	0.038 (0.81)
Regional control	Regional per capita GDP	PGDP				-0.172 (-0.50)
Constant		_cons	-1.606*** (-13.47)	-5.076*** (-5.57)	-5.359*** (-5.32)	-3.306 (-0.90)
N		N	3428	3417	3417	3417
Time and region FE			NO	YES	YES	YES

Note: Values are coefficients with t-statistics in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

### 5.2. Endogenous Test

Although benchmark regression has controlled for individual and household level characteristic variables, there may still be endogeneity bias between digital literacy and entrepreneurial decisions of young farmers due to omitted variables, measurement errors, and reverse causality. To conduct more reliable causal identification, as shown in Table 4, this study used the instrumental variable method (IV Probit) for estimation, selecting "average digital literacy of other residents in the same community" as the instrumental variable. This variable satisfies the correlation condition: individual digital literacy is influenced by community environment and peer effects, it was confirmed that the model has endogeneity and the instrumental variable estimation results are effective. Overall, after controlling for endogeneity, digital literacy still has a robust promoting effect on entrepreneurial decision-making among rural young people aged 18-45, and the reliability of research conclusions is further enhanced.

**Table 4.** Endogenous test

	(1)	(2)
	Szsy	Cre
The average digital literacy of other residents in the same community	0.070* (1.80)	
Szsy		65.085* (1.77)
Constant	-0.142* (-1.65)	2.146 (0.28)
N	3213	3213
All controls	YES	YES
F	43.3929	
adj.R <sup>2</sup>	0.1465	
AR	44.75**	
Wald	3.12**	

Note: Values are coefficients with t-statistics in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

**Table 5.** Robustness Test

	(1)	(2)	(3)	(4)
	Cre			
	Logit	Excluding municipalities	Excluding IQ problem	Winsorized 5%
Szsy	1.924*** (3.71)	1.082*** (4.00)	1.066*** (3.87)	1.093*** (3.82)
Constant	-6.384 (-0.83)	-5.171 (-1.14)	-3.096 (-0.77)	-2.613 (-0.51)
N	3417	3329	3288	3417
All controls	YES	YES	YES	YES
Time and region FE	YES	YES	YES	YES

Note: Values are coefficients with t-statistics in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

As shown in Table 5, to validate the reliability of the benchmark regression findings, this study conducted systematic robustness tests across three dimensions: model specification, variable measurement, and sample scope. A series of tests collectively confirm that the promoting effect of digital literacy on entrepreneurial decisions among young farmers is highly reliable and universally applicable, and is not attributable to model specifications, extreme sample conditions, or specific regional characteristics.

### 5.3. Mechanism Verification

To reveal the internal mechanism of how digital literacy affects young farmers' entrepreneurial decisions, this study constructs an intermediary path framework based on resource-based theory and entrepreneurial process theory, with formal credit acquisition, living security level, and social embedding degree as the core, and uses a standardized "two-step method" to test the mechanism.

As shown in Table 6, the first step is to examine the impact of digital literacy on various mechanism variables. Columns (2) to (4) show that digital literacy has a positive and significant impact on the three mechanism variables of formal credit acquisition, living security level, and social embeddedness. Digital literacy significantly enhances the social embedding level of young farmers, reflecting that digital tools help young farmers expand their social networks, obtain information and emotional support, and enhance their social capital level. The second step of testing involves incorporating the first step of testing into the benchmark model for entrepreneurial decision-making. Digital literacy can not only improve the entrepreneurial decisions of young farmers, but also influence their entrepreneurial decisions through three mechanisms: formal credit acquisition, living security level, and social integration level. Overall, hypothesis 2 holds true.

**Table 6. Mechanism Inspection**

	(1) Cre	(2) Bcs	(3) SD	(4) Rq
Szsy	1.027*** (3.84)	0.417* (1.81)	0.376*** (3.55)	0.896** (2.53)
Constant	-3.306 (-0.90)	6.893 (1.14)	-2.950*** (-9.82)	4.170*** (4.23)
N	3417	3425	3425	3425
All controls	YES	YES	YES	YES
Time and region FE	YES	YES	YES	YES

Note: Values are coefficients with t-statistics in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

### 5.4. Heterogeneity Test

As shown in Table 7, in order to further investigate the group differences in the impact of digital literacy on entrepreneurial decisions of young farmers, heterogeneity analysis was conducted from three dimensions: region, gender, and income. This article divides the country into three major regions based on traditional division methods: the eastern, central, and western regions. The regional heterogeneity from column (1) to column (3) shows that the promotion effect of digital literacy on young farmers' entrepreneurship presents a distribution pattern of "central leadership, decreasing in order from east to west". In the eastern region, although the digital economy infrastructure is well-developed, the market competition is fierce and the cost of entrepreneurship is relatively high. For young farmers, the marginal contribution of digital literacy is relatively limited. The central region is currently at the intersection of industrial

transformation and the booming development of the digital economy, providing a large number of entrepreneurial opportunities such as e-commerce and digital agriculture for young farmers. The western region is constrained by insufficient coverage of digital infrastructure and incomplete industrial support, making it difficult for young farmers to find suitable entrepreneurial opportunities even if they master digital skills.

The gender heterogeneity in columns (4) and (5) indicates that digital literacy is influenced by gender differences in the entrepreneurial decisions of young farmers. The promotion effect of digital literacy on entrepreneurship among young female farmers is significantly stronger than that of young male farmers. Explain the unique value of digital technology in promoting gender equality, helping young female farmers break through the limitations of traditional social roles and family responsibilities. Through flexible entrepreneurial forms such as e-commerce and live streaming, they can leverage their advantages in communication, detail management, and expand their development space. Assuming 3a holds true. The promotion effect of digital literacy on entrepreneurship among young rural women is significantly stronger than that of male groups.

The income heterogeneity of columns (6) and (7) shows the impact of digital literacy on entrepreneurial decisions of young farmers from different income groups. The entrepreneurial incentive effect of digital literacy on low-income young farmers is significantly higher than that on high-income groups. Assuming 3b holds true. Low income young farmers generally face multiple constraints of funding, information, and social capital. Digital literacy effectively alleviates entrepreneurial barriers by improving the accessibility of credit for young farmers, expanding information channels and social networks. The high-income young farmers themselves have better resource endowments, and digital literacy plays a more supportive and enhancing role. In summary, hypothesis 3 holds true. Digital literacy has significant regional heterogeneity, gender heterogeneity, and income heterogeneity in the entrepreneurial decision-making of young farmers.

**Table 7.** Heterogeneity test

Variable	(1)Cre	(2)Cre	(3)Cre	(4)Cre	(5)Cre	(6)Cre	(7)Cre
	Eastern	Central	Western	Male	Female	Low income	High income
Szsy	1.123** (2.44)	1.277*** (2.63)	0.799* (1.73)	0.890** (2.55)	1.319*** (3.06)	1.108*** (3.15)	0.915** (2.15)
Constant	4.427 (0.42)	-37.462** (-2.52)	-3.833 (-0.93)	-5.142 (-1.21)	-5.997 (-1.04)	-6.130 (-1.43)	-2.985 (-0.40)
N	1148	953	1308	1760	1605	2146	1176
All controls	YES	YES	YES	YES	YES	YES	YES
Time & location FE	YES	YES	YES	YES	YES	YES	YES

Note: Values are coefficients with t-statistics in parentheses. \*\*\* p < 0.01, \*\* p < 0.05, \* p < 0.1.

## 6. Conclusion and Suggestions

This study is based on 2020 and 2022 CFPS data, using the Probit model testing system to examine the impact of digital literacy on entrepreneurial decision - making of 18 - 45 - year - old young farmers and its mechanisms. The main conclusions are: Digital literacy significantly promotes young farmers' entrepreneurial decision - making with obvious structural characteristics. At the dimensional level, "digital shopping literacy" has the strongest promoting effect, while "digital basic literacy" has an inhibitory effect, highlighting the role of

digital skill content structure in empowering entrepreneurship. At the functional pathway level, digital literacy alleviates core obstacles in entrepreneurship through three channels: enhancing formal credit acquisition ability, improving family life security, and expanding social network embedding. At the spatial distribution level, its promotion effect has a gradient of "central leadership, followed by the east, and weaker in the west", and shows stronger marginal effects on women and low - income groups, highlighting digital technology's potential in inclusive development. These findings offer a theoretical explanation for digital literacy's entrepreneurial empowerment mechanism and empirical evidence for formulating rural revitalization policies.

Firstly, implement a differentiated regional promotion strategy: in the eastern region, promote the deep integration of digital technology and county - level characteristic industries and support agricultural product e - commerce branding; in the central region, build a digital entrepreneurship incubation center based on industrial transfer and create a "digital literacy+industrial cluster" linkage model; in the western region, prioritize network and logistics infrastructure full - coverage and consolidate the digital entrepreneurship foundation. Secondly, optimize the digital skills training system: strengthen applied skills training like e - commerce operations and online marketing, reduce basic operation repetitive investment, and jointly build a "teaching - training - incubation" integrated cultivation chain with e - commerce platforms. Thirdly, improve entrepreneurial financial services: develop credit loan products based on digital footprints, establish a special fund for young farmers' digital entrepreneurship, promote the "digital literacy+entrepreneurship insurance" linkage model to alleviate entrepreneurial fund constraints. Fourth, implement targeted support for key groups: cultivate light entrepreneurship models like live - streaming sales for female farmers, offer "skill training+start - up funds" support for low - income farmers, and establish an entrepreneurial companionship system. Finally, establish a sound collaborative promotion mechanism: integrate resources of government departments, financial institutions, and e - commerce platforms, launch a "digital literacy certification - credit approval - logistics preferential" policy service package, cultivate county - level digital service brokers, and build a comprehensive entrepreneurial support ecosystem.

## References

- [1] George, G., & Lin, Y. (2017). Analytics, innovation, and organizational adaptation. *Innovation*, 19(1), 16–22. <https://doi.org/10.1080/14479338.2016.1252042>
- [2] Ding, X., & Elahi, E. (2025). Social networks, household entrepreneurship, and relative poverty in rural China: The role of information access and informal funding. *Humanities and Social Sciences Communications*, 12(1), 620. <https://doi.org/10.1057/s41599-025-04562-z>
- [3] Li, J., Wu, Y., & Xiao, J. J. (2020). The impact of digital finance on household consumption: Evidence from China. *Economic Modelling*, 86, 317–326. <https://doi.org/10.1016/j.econmod.2019.09.027>
- [4] Wang, J. (2025). Can digital literacy improve income mobility? Evidence from China. *Telecommunications Policy*, 49(6), 102960. <https://doi.org/10.1016/j.telpol.2025.102960>
- [5] Qing, J., & Chen, J. (2024). Digital village construction and its mechanistic on farmer entrepreneurship. *Finance Research Letters*, 70, 106258. <https://doi.org/10.1016/j.frl.2024.106258>
- [6] Giannetti, M. (2011). Liquidity constraints and occupational choice. *Finance Research Letters*, 8(1), 37–44. <https://doi.org/10.1016/j.frl.2010.08.001>
- [7] Bauernschuster, S., Falck, O., & Heblich, S. (2010). Social capital access and entrepreneurship. *Journal of Economic Behavior & Organization*, 76(3), 821–833. <https://doi.org/10.1016/j.jebo.2010.09.014>
- [8] Brynjolfsson, E., & McAfee, A. (2016). *The second machine age: Work, progress, and prosperity in a time of brilliant technologies*. W. W. Norton & Company.

- [9] Aker, J. C., & Mbiti, I. M. (2010). Mobile phones and economic development in Africa. *Journal of Economic Perspectives*, 24(3), 207–232. <https://doi.org/10.1257/jep.24.3.207>
- [10] Bandura, A. (1997). *Self-efficacy: The exercise of control*. W. H. Freeman and Company.
- [11] Bürgel, T. R., Hiebl, M. R. W., & Pielsticker, D. I. (2023). Digitalization and entrepreneurial firms' resilience to pandemic crises: Evidence from COVID-19 and the German Mittelstand. *Technological Forecasting and Social Change*, 186, 122135. <https://doi.org/10.1016/j.techfore.2022.122135>
- [12] Nguyen, T. T., Dao, T. T., Tran, T. B., et al. (2024). Fintech literacy and digital entrepreneurial intention: Mediator and moderator effect. *International Journal of Information Management Data Insights*, 4(1), 100222. <https://doi.org/10.1016/j.ijime.2024.100222>
- [13] Barney, J. (1991). Firm resources and sustained competitive advantage. *Journal of Management*, 17(1), 99–120. <https://doi.org/10.1177/014920639101700108>
- [14] World Bank. (2021). *World development report 2021: Data for better lives*. <https://digitallibrary.un.org/record/3963929> <https://doi.org/10.1596/978-1-4648-1600-0>
- [15] Sun, K., Liu, X., Yu, Y., & Zou, J. (2024). Bridging the gender gap in entrepreneurship and empowering women via digital technologies. *Academic Journal of Humanities & Social Sciences*, 7(6), 102–108. <https://doi.org/10.25236/AJHSS.2024.070618>
- [16] Reddy, P., Chaudhary, K., & Hussein, S. (2023). A digital literacy model to narrow the digital literacy skills gap. *Heliyon*, 9(4), e14878. <https://doi.org/10.1016/j.heliyon.2023.e14878>
- [17] Block, J., & Sandner, P. (2009). Necessity and opportunity entrepreneurs and their duration in self-employment: Evidence from German micro data. *Journal of Industry, Competition and Trade*, 9(2), 117–137. <https://doi.org/10.1007/s10842-007-0029-3>
- [18] Li, S. (2025). Digital literacy and farmers' non-farm employment—An empirical study based on CFPS. *Sustainable Futures*, 10, 100999. <https://doi.org/10.1016/j.sftr.2025.100999>
- [19] Bartikowski, B., Laroche, M., Jamal, A., et al. (2018). The type-of-internet-access digital divide and the well-being of ethnic minority and majority consumers: A multi-country investigation. *Journal of Business Research*, 82, 373–380. <https://doi.org/10.1016/j.jbusres.2017.05.033>
- [20] Wang, S., Qu, C., & Yin, L. (2025). Digital literacy, labor migration and employment, and rural household income disparities. *International Review of Economics & Finance*, 99, 104040. <https://doi.org/10.1016/j.iref.2025.104040>