

A survey on the digital skill status of rural elderly groups under the digital village strategy: an example from Sichuan, Gansu and Zhejiang provinces

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Abstract. Digital village is an important task under the deployment of rural revitalization strategy, and an inevitable requirement for building digital China. However, the implementation of digital village is mostly based on macro or regional perspective, neglecting the assessment of digital skills at micro level, which makes it difficult to judge the effect of digital village strategy implementation and improvement routes comprehensively. Therefore, this paper takes the rural elderly digital groups in Sichuan, Gansu and Zhejiang provinces as the research objects, and constructs a digital skills framework for the groups by factor analysis and field research. We explore the direction and degree of their influencing factors through multiple regressions in order to provide suggestions for a feasible digital skills framework and the construction of digital villages.

Keywords: Digital skills; rural revitalization; digital village; governance research.

1. Introduction

Digital village is an important strategic direction for rural revitalization and a key element of building digital China. The Central Committee of the Communist Party of China have given strategic significance to the construction of digital village, and continue to strengthen the top-level design of digital village construction and frequently issue important documents.

However, there are still problems with the construction of digital villages in China. Among them, the lack of digital skills of rural residents is particularly crucial. Among the rural residents, the elderly in rural areas are the most prevalent group of digital skills deficiency. From the data perspective, the Statistical Report on the Development Status of the Internet in China (44th) shows that the proportion of Chinese Internet users who are over 60 years old is only 6.9% in 2019, while the proportion of elderly people over 60 years old in the total population is 18.1% in 2019. Simultaneously, there is a lack of first-hand data on the usefulness of digital skills at the micro level, and digital skills research usually focuses on the description of regional overall digital characteristics, ignoring the degree of adaptation and harvest of micro subjects in digital village, making it difficult to clarify the effect of implementation of digital village. Therefore, how to construct a micro-level digital skills index and explore its influencing factors is important to fill the research gaps and promote the implementation of the digital village strategy.

2. Literate Review

2.1 What is “digital skills”

A number of concepts have emerged to refer to digital competencies, all of which are derived from the concept of "digital literacy. The term "digital literacy" was first introduced by Paul Gilster in 1997 in his book, which considered that digital literacy refers to the ability to access, understand and integrate digital information. Since then, different scholars have researched this concept and adopted many different expressions, such as "digital competence", "digital intelligence", "digital aptitude", etc. Ultimately, from the perspective of Sen's feasible competencies, the various expressions are different interpretations of the same feasible competency. Therefore, we can define digital skills as

follows: the ability to apply digital tools and other digital technology tools to achieve digital specific goals in daily production life.

2.2 How to evaluate “digital skills”

The theoretical framework proposed by Israeli scholar Alkalai in 2004 is the most classic framework, and it is the starting point for many current digital skills frameworks. His framework contains five core elements: picture visual literacy, which is the ability to understand graphics; recreation literacy, which is the ability to "copy" creatively; branching literacy, which is the ability to navigate hypertext and non-linearity; information literacy, which is the ability to critically discern information; and socio-emotional literacy, which is the ability to understand and communicate digitally. Later, he added real-time thinking literacy to this framework.

The European Council launched the Digital Competence Framework for European Citizens (DigComp) in December 2010 and continues to update its content. The EU digital skills framework is divided into five major literacy domains: information, communication and cooperation, digital content creation, security and protection, and problem solving. This framework scientifically covers the digital skills needs of different populations at multiple levels from basic to comprehensive development, from low to high.

In order to eliminate geographical limitations as much as possible, UNESCO has undertaken the development of a global framework for digital skills. In 2018, UNESCO published guidelines for a global framework for digital skills. This guide is subdivided into seven literacy domains. This guide adds the most basic domain of digital tools operation and the highest level of career development. The strengths of the framework are that it considers the levels of different regions. The addition of the career development domain enhances the practicality of the framework.

3. Method

3.1 Construction of digital skills score system

For the rural digital skills assessment, this dissertation has developed the following questions for rural elderly digital skills measurement by referring to literature and field pre-survey.

Table. 1 Construction of digital skills score

Level	Dimension	Question Description
Basic Level	information	Have you ever used a browser to get information
		Have you ever used the following software: Tiktok, Kwai, Tencent Video, iQiyi, Youku, etc? Do you know that your mobile phone can record daily usage time?
	sociality	Have you ever used QQ, WeChat and other social software?
		Do you know other functions of qq, WeChat and other software besides social networking?
		Have you ever joined WeChat group or qq group? Will you forward the information you are interested in browsing in WeChat group or qq group?
shopping	Have you ever used shopping software for shopping? Do you use mobile payment in your daily life?	
Developing Level	health	Have you ever used your mobile phone to register online? Have you ever used Baidu and other software to query relevant pathological information?
	security	Have you ever downloaded the software of the National Anti Fraud Center? Do you often disclose personal information to others to obtain benefits?
	finance skill learning creation	Have you ever used your mobile phone to transfer money, deposit and loan, finance and other financial activities? Have you learned new skills through mobile phones, computers and other channels? Have you ever independently shot Internet videos?
		Practice
Others		Have your children taught you to use smartphones or the Internet? Has the government publicized and supported the use of the Internet? Do you have a smartphone before 2020? What is your attitude towards using the Internet?

3.2 Digital Skills Literacy Indicator Measurement - Factor Analysis

After considering different empowerment methods and studying the relevant literature, the team selected a principal factor analysis to construct a digital skills index.

First consider whether the obtained data are suitable for factor analysis. The data showed a KMO value of 0.842 and a significant Bartlett's spherical test p-value, so factor analysis can be used

The factor matrix was rotated in stata to extract the three effective components, and the three factor scores were reported separately, weighted according to the cumulative variance contribution of the three scores, and finally the composite score was obtained.

4. Empirical analysis

4.1 Model Analysis

Using the digital skills index as the dependent variable, age, annual income, gender, length of residence in rural areas, education level, and child help, government support, pre-2020 smartphone ownership, and attitude toward the Internet were used to construct multiple linear regression models to explore the extent to which each factor influenced digital skills.

To better explore the effects, a stepwise increasing independent variable regression was used:

$$dig_literacy = \beta_0 + \beta_1age + \beta_2income + \beta_3stay + \mu \tag{1}$$

$$dig_literacy = \beta_0 + \beta_1age + \beta_2income + \beta_3stay + \beta_4edu + \mu \tag{2}$$

$$dig_literacy = \beta_0 + \beta_1age + \beta_2income + \beta_3stay + \beta_4edu + \beta_5child_help + \beta_6propaganda + \beta_7process + \beta_7attitude + \mu \tag{3}$$

4.2 Analysis of factors influencing digital skills in rural elderly groups

Using the overall sample regression results according to equation (1)(2)(3) are as follows.

Table 2. regression to digital skill

regression to digital skill						
VARIABLES	Overall model1	Overall model2	Overall model3	Sichuan model3	Gansu model3	Zhejiang model3
Age	-0.036*** (0.005)	-0.016*** (0.005)	0.010*** (0.004)	0.0224*** (0.007)	-0.018 (0.011)	-0.0757 (0.007)
Annual income	0.003 (0.002)	0.002** (0.001)	0.002*** (0.001)	0.007*** (0.002)	0.001 (0.003)	0.002*** (0.000)
Gender	0.170** (0.080)	0.037 (0.059)	-0.009 (0.049)	-0.018 (0.070)	0.093 (0.087)	0.004 (0.137)
Rural residence time month	-0.037 (0.032)	-0.024 (0.022)	-0.051* (0.027)	-0.015 (0.045)	-0.088*** (0.026)	-0.0439
_I Edu_2		0.365*** (0.084)	0.128** (0.059)	0.106 (0.080)	0.115 (0.162)	-0.008 (0.097)
_I Edu_3		0.601*** (0.096)	0.201*** (0.077)	0.309** (0.147)	0.221 (0.191)	0.126 (0.156)
_I Edu_4		1.216*** (0.106)	0.549*** (0.120)	0.550*** (0.181)	0.742* (0.434)	0.462 (0.278)

_I Edu_5		1.610***	0.816***	0.794***	0.762	
		(0.102)	(0.117)	(0.171)	(0.498)	
Child Support			0.068	0.244***	-0.150	0.281**
			(0.048)	(0.089)	(0.157)	(0.114)
Government Support			0.497***	0.377**	0.242	0.925***
			(0.090)	(0.144)	(0.263)	(0.216)
Smartphone owner			0.459***	0.472***	0.233	0.436**
			(0.064)	(0.092)	(0.199)	(0.210)
Attitude towards the Internet_2			0.011	-0.001	-0.182	0.181
			(0.064)	(0.079)	(0.120)	(0.189)
Attitude towards the Internet_3			-0.203*	-0.252**	-0.346*	
			(0.114)	(0.097)	(0.172)	
Constant	2.330***	0.584	0.427	-0.886	1.537**	-0.975
	(0.446)	(0.417)	(0.377)	(0.639)	(0.643)	(0.588)
Observations	228	228	228	130	58	40
R-squared	0.253	0.609	0.771	0.764	0.814	0.888
rank	5	9	14	14	13	11
r2_a	0.239	0.595	0.757	0.738	0.759	0.850
r2	0.253	0.609	0.771	0.764	0.814	0.888
F	22.75	144.3	134.9	112.1	.	97.14
Robust standard errors in parentheses, *** p<0.01, ** p<0.05, * p<0.1						

From the overall situation analysis, the following conclusions can be drawn.

Age has a significant negative effect on the digital skills literacy of rural elderly people, with each year of age leading to a 0.01 decrease in digital skills literacy, all other things being equal. Digital skills as a novelty will take a lot of time to cultivate, so the older we are, the less energy we can put in and the less we are willing to put in, which has a negative impact on digital skills literacy.

Income has a significant positive impact on the digital literacy of the rural elderly, and for every 1,000RMB increase in income level, the digital literacy of the rural elderly will increase by 2. The direct impact of income level on the digital literacy of the rural elderly is that it affects the channels and frequency of digital literacy. The higher the income level is, the more diverse the channels are, including but not limited to cell phones, computers, outings, etc., and the more free time they have at their disposal, i.e., the more energy they can devote to digital skills; the indirect effect of income level on the rural elderly group is to influence the atmosphere and willingness of the elderly group to receive digital skills, the higher the income level is, the higher the average level of digital skills literacy of the groups they come into contact with, the more the elderly group's The higher the income level, the higher the average level of digital skills literacy of the groups they are in contact with, and the homogenization and sharing of the social circle of the elderly group still exist, so the elderly group in rural areas will be more willing to learn and use digital skills for the need of socializing in old age.

Gender had a negative but non-significant effect on digital skills literacy among rural older adults. Other things being equal, females have a weaker effect with an average of 0.009 points lower than males, with a significant effect before adding education for regression, but no longer significant after adding the education factor. In general, in rural areas, productivity is at a lower level, and traditional manufacturing and agriculture are still the main pillar industries of the region, and the jobs available in these pillar industries are mainly oriented to men, so the exposure to the Internet and the ability to support exploration of the Internet are higher for men compared to women, which may have a negative effect on digital literacy skills.

Education had a significant positive effect on digital skills literacy among the rural elderly group. Compared with those who did not attend school, the digital skill scores of those with elementary school education are on average 0.128 higher and those with bachelor degree or above are on average

0.816 higher, which can be explained by the following two dimensions. Their potential willingness and ability to accept new things will increase, and after systematic and systematic education, they will be more likely to accept digital skills in the form of rules and regulations; secondly, the older people surveyed in this project are basically over 50 years old, and they received their education in the 1960s-70s, which was limited by the productivity constraints at that time, and education was more scarce than resources at that time. Therefore, the families of the respondents who could receive good education at that time had certain economic strength, and compared with other respondents, these respondents often had more opportunities and better economic conditions to access digital skills carriers and the average level of digital skills literacy in their social circles was higher compared with other respondents. This is a significant increase in digital skills literacy.

Government advocacy and smartphone ownership by 2020 have a positive effect on the digital skills literacy of the rural elderly. In comparison with areas and residents who did not receive government promotion and support, those who received promotion and support scored 0.497 higher on average, which shows that the government should reach all people more widely and deeply in the construction of digital villages and fill the gap of promotion and support to improve the digital skills of rural residents. Therefore, the team chose "whether or not to own a smartphone before 2020" to avoid the external influence of special factors to a certain extent. The results show that those who have already used smartphones before 2020 have a higher digital skills score of 0.459 on average than those who start using smartphones after 2020, although this is influenced by the chronological order, as those who have access to smartphones and the Internet earlier generally have a longer time to adapt to digital products and their use and longer practice.

In addition, the attitudes of rural digital residents towards the Internet also have an impact on digital skill literacy, with the group holding negative attitudes scoring 0.203 lower in digital skills compared to the group holding positive attitudes. due to the large number of people choosing the neutral option as a whole, the indicative nature of the results is distorted, but it is still possible to obtain that the group that does not hold negative sentiments towards the Internet may be better able to embrace digital tools and products, contributing to digital skills improvement.

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