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Investigation on the Willingness and Influencing Factors of Digital Reciprocity among Digital Natives

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Abstract

With the development of China's internet industry and the emergence of new technologies, digital services have been widely utilized, altering production and lifestyles while enhancing societal efficiency. However, the rapid growth of the elderly population has highlighted the issue of the digital divide. To address this challenge, it is crucial to enhance the digital skills of the elderly. The "Digital Feedback" initiative relies on the assistance of young people, who provide solutions, share knowledge, and impart skills to promote the widespread adoption of digital technology among the elderly, thereby reducing the digital divide. By investigating and analyzing the willingness of digital natives to engage in digital feedback, practical references are provided to improve the digital literacy of the elderly and enhance their quality of life. This investigation, combining previous research and semi-structured interviews, employs the UTAUT model and introduces three new variables— "self-efficacy," "intergenerational relationships," and "risk perception"—to construct a model influencing the willingness to engage in digital feedback. A questionnaire was designed for digital natives in Zhejiang Province, and 470 valid responses were collected. Through statistical software analysis, pathways to enhance willingness for digital feedback are proposed, along with suggestions for optimizing solutions to the digital divide among the elderly in the future.

Keywords

Digital feedback, Elderly digital skills, Digital natives, Digital divide, UTAUT model

1. Introduction

In 2023, according to the 51st Statistical Report on Internet Development in China released by the China Internet Network Information Center (CNNIC), the Internet industry in China has continued to grow steadily. As of December 2022, the number of Internet users in China reached 1.067 billion, an increase of 35.49 million from the previous year, with an Internet penetration rate of 75.6%. This indicates that China has established a large and vibrant online society. With the rapid development of new technologies such as the Internet, big data, and artificial intelligence in China, intelligent and digital services have been widely used, fundamentally changing production and lifestyle, and improving social governance and service efficiency.

However, the elderly population in China is growing rapidly. By the end of 2022, the population aged 60 and above reached 280 million, accounting for 19.8% of the total population, with an additional 12.68 million elderly people. The increase in the elderly population has brought significant challenges in adapting to the Internet. According to the Statistical Report on Internet Development in China, the proportion of Internet users aged 50 and above has increased to 30.8%, an increase of 4 percentage points from the previous year. The Internet is penetrating further into the middle-aged and elderly population, presenting both opportunities and

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challenges. Many middle-aged and elderly people are not familiar with the Internet, do not know how to use smartphones, and therefore encounter many inconveniences in daily life, unable to fully enjoy the convenience brought by digital and intelligent services. Due to differences in cultural literacy, integration ability, and social networks, the "digital divide" between some middle-aged and elderly people and digital life is increasingly prominent.

To address this challenge, the concept of "Digital reciprocity" has emerged. Digital reciprocity is a way for young people to help older people learn and apply digital technology. It aims to achieve the transformation of information and technology between middle-aged and elderly groups and young people by providing solutions, sharing knowledge, and imparting skills, thereby eliminating the digital divide, improving the digital literacy of the elderly, improving their quality of life, alleviating social isolation risks, and promoting the benign development of intergenerational relations.

In recent years, the government has paid great attention to this issue and issued a series of related documents. The "14th Five-Year Plan" for Digital Economic Development explicitly aims to formulate a special training plan to improve digital skills and abilities for the elderly and other groups. In addition, the "Implementation Plan for Effectively Solving the Difficulties of the Elderly in Using Intelligent Technology" proposes to basically establish a long-term mechanism to solve the digital divide among the elderly by the end of 2022.

As a new way of information transmission, digital reciprocity can bridge the gap between generations, regions, and cultures, promote mutual communication between older and younger generations, reduce age gaps and ideological differences, and alleviate the loneliness of the elderly, enhancing their happiness. In the future, with the acceleration of technology and knowledge transmission, the phenomenon of digital reciprocity between generations will have more development space.

Existing research still has some shortcomings. There is a lack of specific research on the willingness of digital natives to engage in digital reciprocity, and the UTUAT model used in the study, as a basic model, does not fully explain all the variables in this study. Therefore, this study will systematically explore and investigate the willingness and influencing factors of digital reciprocity among digital natives.

2. Research Design

2.1. Model

After reviewing relevant literature and documents both domestically and internationally, we designed a study on the factors influencing satisfaction with vocational skills training participation. The UTAUT model, as a basic model, does not cover all variables of this survey. Based on the results of interviews and data collection, we introduced three core variables: self-efficacy, intergenerational relationships, and risk perception, to address the shortcomings of the single model and then construct the research model, define variables, propose research hypotheses, design survey questionnaires, and collect and analyze data as the basis for empirical analysis. The model proposed in this survey is as follows:

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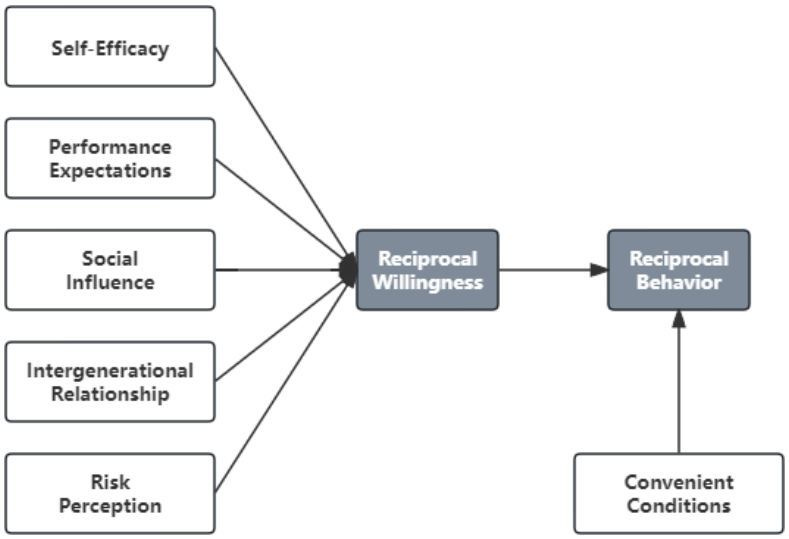

Figure 1: Research Model

2.2. Objects

"The digital natives," also known as "digital aboriginals" or "digital natives," is a concept first proposed by educational game expert Marc Prensky in 2001, referring to those who are born, grow up, and become adults alongside high technology. Digital natives can quickly and conveniently access the information they need through the Internet, and the way they communicate information breaks down barriers in interpersonal communication in real life. Therefore, this group of people possesses the ability for digital mentoring and often faces scenarios or needs for digital mentoring, making them suitable subjects for this survey.

For ease of statistical research and in accordance with the actual situation of the survey participants, the following conditions are required:

(1) They belong to the digital natives, i.e., those born after 1980, with an age of up to 43 years old.

(2) They have had experiences of digital mentoring or have elder family members with digital mentoring needs. According to the research purpose, it is necessary to study the willingness for digital mentoring, so the survey participants must have had experiences of digital mentoring or have elder family members with digital mentoring needs, requiring the survey participants to engage in digital mentoring.

Regarding face-to-face interviews, the interviewees included 4 elderly individuals, 4 teenagers and 4 smart software suppliers, totaling 12 participants.

2.3. Data Processing

SPSS 27.0 was used to input the data, descriptive analysis and correlation analysis were carried out. AMOS 25.0 was used to establish the model and analyze the path. $P<0.05$ was considered statistically significant.

3. Results

This survey adopted a combination of online and offline methods. A total of 620 questionnaires were distributed, with 551 questionnaires returned and 470 valid responses, resulting in an effective rate of 85.30%. Among the respondents, 45.11% were male and 54.89% were female. The age distribution was as follows: 26.60% were aged 20 or below, 51.49% were aged between 21 and 30, 15.53% were aged between 31 and 40, and 6.38% were aged 41 and above.

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3.1. Questionnaire Quality

3.1.1. Reliability Analysis

This study measures the internal consistency of the questionnaire scale using Cronbach's α coefficient for the factors. According to Gueford (1965), a Cronbach's α value greater than 0.7 indicates high reliability. The Cronbach's α value for this study is 0.936, indicating excellent reliability level of the questionnaire, see Table 1.

Table 1: Reliability Statistics

Cronbach's Alpha	N of Items
0.936	21

3.1.2. Reliability Analysis

KMO is a test conducted to examine the strength of the partial correlation (how the factors explain each other) between the variables. KMO values closer to 1.0 are consider ideal while values less than 0.5 are unacceptable. In this study, we had a KMO value of 0.862. This indicates that the degree of information among the variables overlap greatly/the presence of a strong partial correlation, see Table 2.

Table 2: KMO and Bartlett's Test

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.		.862
Bartlett's Test of Sphericity	Approx. Chi-Square	18580.416
	df	20
	Sig.	.000

3.2. Correlation Analysis

The correlation analysis showed that 'Self-Efficacy', 'Performance Expectations', 'Social Influence', 'Intergenerational Relationship' and 'Reciprocal Willingness' were positively correlated with each other, 'Risk Perception' was negatively correlated with other factors. All the correlations showed statistically significnce(P<0.01). Results are shown in Table 3.

Table 3: Descriptive statistics and Correlation Analysis (n=470)

	M±SD	1	2	3	4	5	6
Self-Efficacy	3.95±1.091	1					
Performance Expectations	3.79±0.973	.863**	1				
Social Influence	3.95±.998	.871**	.866**	1			
Intergenerational Relationship	3.84±.993	.803**	.794**	.803**	1		
Risk Perception	2.92±1.054	-.372**	-.461**	-.395**	-.457**	1	
Reciprocal Willingness	3.71±1.069	.813**	.805**	.788**	.832**	-.508**	1

3.3. Structural Equation Modeling

On the basis of literature review, correlation analysis and model assumption, structural equation model was used to analyze the mechanism of 'Self-Efficacy', 'Performance Expectations', 'Social Influence', 'Intergenerational Relationship' and 'Risk Perception' on 'Reciprocal Willingness', as well as the mechanism of 'Reciprocal Willingness' and 'Convenient Conditions' on 'Reciprocal Behavior'.

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The output of the model data analysis did not indicate any violations of estimation assumptions. The fit indices of the model all meet the evaluation criteria, indicating that the proposed model for the influencing factors of digital natives' willingness to reciprocate fits well with the observed data. From a statistical perspective, it is acceptable. The fit indices of the model are as follows, see Table 4.

Table 3: Fit Indices of Structural Equation Model

Fit Indices	χ^2/df	RMSEA	PCFI	PGFI	PNFI	GFI
Referance	＜3	＜0.8	＞0.5	＞0.5	＞0.5	＞0.8
Model	2.752	0.78	0.785	0.629	0.769	0.865

As is shown as Figure 2, the path coefficients on each path are extremely significant. Therefore, 'Self-Efficacy', 'Performance Expectations', 'Social Influence' as well as 'Intergenerational Relationship' positively affects 'Reciprocal Willingness'. 'Risk Perception' negatively affects 'Reciprocal Willingness', which also corroborated by the results of the correlation analysis, supporting our hypothesis.

Meanwhile, the chain mediating effect from 'Reciprocal Willingness' to 'Reciprocal Behavior' is also significant. Moreover, 'Convenient Conditions' positively affects 'Reciprocal Behavior'.

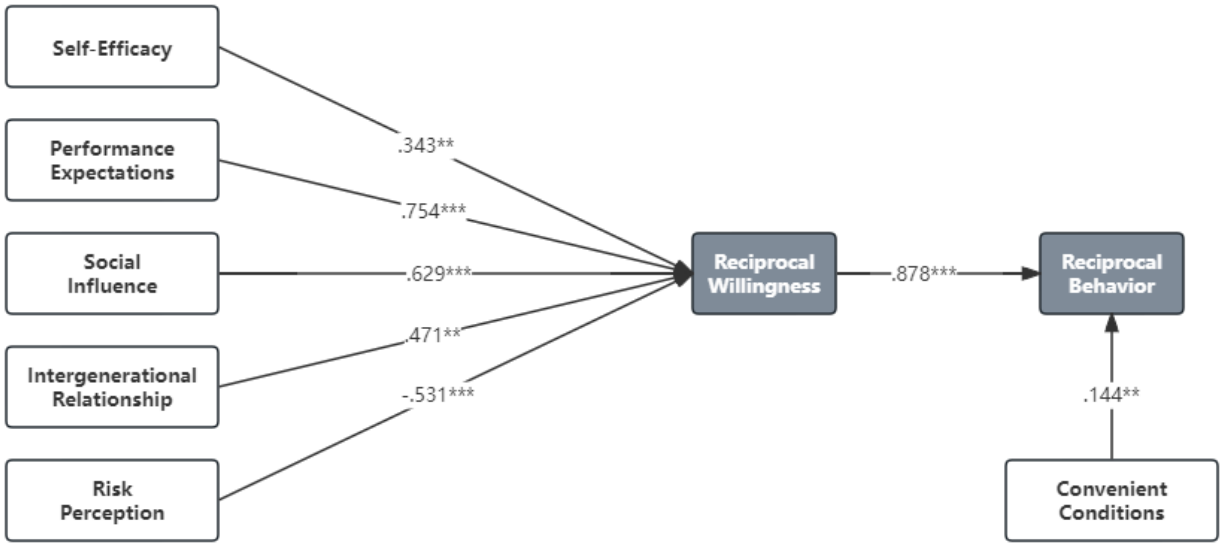

Figure 2: Path Coefficient Diagram

4. Discussion

According to the survey, the level of regurgitation behavior among digital natives is relatively high. Digital natives generally have higher levels of education and advanced reciprocal values. Moreover, they exhibit a strong sense of social responsibility and willingly undertake reciprocal responsibilities. They consciously engage in regurgitation behavior and possess strong digital skills and literacy. They are capable and patient, enabling them to effectively teach their elders digital skills.

This study utilized various analytical methods including factor analysis and structural equation modeling using SPSS, AMOS, and EXCEL software to explore the relationships among 'Self-Efficacy', 'Performance Expectations', 'Social Influence', 'Intergenerational Relationship', 'Risk Perception', 'Reciprocal Willingness', 'Convenient Conditions' and 'Reciprocal Behavior'. It also validated the research hypotheses proposed in this study. Based on these influencing factors, the following targeted recommendations are provided for enhancing reciprocal willingness

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among digital natives, recipients of reciprocal actions, and third parties, focusing primarily on 'Performance Expectations', 'Social Influence', and 'Risk Perception'.

4.1. Reasonably Set Reciprocal Goals and Cultivate Reciprocal Literacy

According to the survey, when digital natives (also referred to as digital aborigines) plan to carry out reciprocal actions to help recipients master digital skills, they tend to have high expectations. However, they may become impatient when implementing reciprocal actions or lack patience when encountering difficulties, which may affect their reciprocal behavior and willingness, or even lead to the termination of reciprocal actions. As a reciprocal group, goals can be broken down based on the ease or difficulty of devices or applications. Reasonable reciprocal goals can be set according to the different abilities of recipients. For example, starting with simple and commonly used applications, assisting recipients in mastering them can not only increase the satisfaction of recipients and enhance their trust in digital natives but also boost the confidence and sense of accomplishment of digital natives, stimulating their reciprocal willingness. In addition, as educational institutions, especially universities and colleges, should attach importance to reciprocal actions and cultivate good reciprocal literacy, becoming the creator of this positive social trend. On the one hand, by strengthening ideological and political education, students can establish correct reciprocal intentions, actively engaging in reciprocal actions both in the family as the younger generation and in society, focusing on themes such as "youth responsibility," "respect for the elderly," and "helping others." On the other hand, integrating reciprocal actions with social practices in schools allows students to gain more successful reciprocal experiences, positively influencing them, and thereby enhancing their reciprocal willingness.

4.2. Strengthen Communication between Reciprocal Parties to Understand and Meet the Needs of Recipients

For the elderly, how to better integrate into the digital society has become a major issue they face in today's Internet age. However, some elderly individuals are unwilling to face this issue. On the one hand, due to objective constraints and lack of contact with digital technology, they do not experience digital challenges, thus the question of "whether they are willing to be reciprocated digitally" does not arise. On the other hand, subjective factors such as traditional thinking and concerns about "losing face" as the educated party may hinder their willingness to accept reciprocal actions. Therefore, it is necessary to adopt appropriate communication methods to strengthen information communication between reciprocal parties and recipients, understand recipients' digital usage, identify problems, and areas where help is needed, and then take targeted solutions. Furthermore, both families and communities play dual roles. China actively promotes family reciprocal actions, which is a practical and ideal way to bridge the digital gap for the elderly. Younger individuals are more likely to maintain a positive attitude toward reciprocal actions when facing repetitive learning behaviors from elders. Communities act as catalysts. For the elderly, communities are important channels for reintegrating into society. They not only provide places for exchanging digital technology but also regularly organize digital technology teaching activities. These efforts should be tailored to the individual and common differences of the elderly group, providing targeted assistance. Through the joint efforts of families and communities, the willingness of the elderly to be reciprocated digitally can be enhanced, enabling them to adapt to the digital society more quickly.

4.3. Guide the Formation of Positive Digital Reciprocal Values to Enhance Social Influence

With the rapid development of China's digital economy, the aging population issue has become increasingly prominent, and the challenges of Internet eligibility are intensifying. In this context,

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relevant government departments should actively play a role in "top-level design," acting as guides and supervisors. The "Opinions on Strengthening the Work of Aging in the New Era" issued in November 2021 by the CPC Central Committee and the State Council pointed out the need to implement the national strategy of actively responding to aging, integrate the concept of active aging into the entire process of economic and social development, accelerate the establishment of a comprehensive policy system and institutional framework, and promote high-quality development of aging work. On the one hand, appropriate policies and regulations should be introduced to further promote the resolution of difficulties encountered by the elderly in using smart technology. The traditional service should be innovated in parallel with intelligent service innovation to provide convenient services for the elderly, alleviate their "technological fears," and gradually adapt them to the changes brought about by information technology. At the same time, active campaigns on reciprocal actions should be launched, focusing on the convenience brought by digital technology and the credibility of digital natives, guiding the elderly to change their existing perceptions, actively embrace digital technology, safeguard their rights in the digital age, and avoid becoming "digital refugees." On the other hand, with the help of official media and government cooperation, positive publicity on reciprocal actions and their impacts should be strengthened, promoting relevant characters and events of reciprocal actions, fostering a "keeping pace with the times" new era filial piety culture, and introducing corresponding encouragement or reward mechanisms to encourage all parties to promote the "trend" of reciprocal actions and achieve universal digital reciprocity.

4.4. Strengthen Market Satisfaction of Elderly Needs and Safeguard Their Digital Rights

The World Health Organization (WHO) proposed the initiative of "active aging" in "Active Aging: From Evidence to Action," calling for equal rights for older people to participate in and use digital facilities, and learn digital knowledge. This requires not only "top-level design" by the national government but also strengthening the market's satisfaction of the needs of the elderly. Digital technology development and design-related enterprises should consider more scenarios for the elderly's use and provide targeted services to alleviate the "technological fears" of the elderly and safeguard their digital rights. On the one hand, digital enterprises should focus on the pain points of the elderly in using digital devices or applications, understand their real needs for digital products and services, such as launching special versions with large fonts, voice versions, and simplified versions, simplifying the use for the elderly, meeting their needs, and tapping into the "blue ocean" market of the elderly in the digital field. When the elderly have universal and convenient Internet access and usage, their willingness to accept digital reciprocal actions will be higher. On the other hand, as enterprises pursue profit maximization, they should also assume corresponding social responsibilities. "Active aging" should not only be advocated by the government but also be implemented by enterprises according to changes in the environment. Enterprises should actively play their role in helping the elderly overcome the digital gap, solving objective problems in reciprocal actions, and achieving win-win economic benefits and social values.

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ISSN: 2710-0170

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