

Research Article

Exploration on the Development Path and Influencing Factors of Digital Ability of Regional Elderly Learning Team —— Empirical Analysis Based on 1792 Samples and 7 Cases in the C District of S City

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Abstract

This study focuses on the exploration of the path to improve the digital ability of elderly learning teams, focuses on the current situation of elderly learning teams in C District of S City, and carries out a comprehensive and in-depth questionnaire survey, with 1,792 valid questionnaires recovered, and 7 interviews recorded and relevant cases formed to validate the results of the questionnaire survey. The study found that the conditions of the elderly learning teams themselves have a decisive influence on their digital ability, and that the courses and activity experience programs at the district level can also effectively improve the digital ability of the elderly learning teams. The study suggests further development of relevant courses, brands, and activity programs, as well as the use of guided education models to stimulate team members' own active learning motivation and digital radiation influence.

Keywords

Education for the Elderly, Digital Ability, Learning Experience, Elderly Members

1. Introduction

At present, China is the only country in the world with an elderly population exceeding 100 million, and the aging trend is further deepening [1]. However, due to intergenerational differences, functional decline, conservative mentality and other reasons, the elderly have a relatively weak acceptance of digital knowledge, leading to the generally low digital ability of the elderly, forming a "Digital Divide". The learning team for the elderly is a typical learning organization for the rural elderly. It has the characteristics of high basic literacy, wide distribution range, strong plasticity, and

strong radiation influence. It is especially suitable to become an important starting point for the improvement of the digital ability of the elderly in the region. This study takes the exploration of the intelligent development path of the elderly learning team as the breakthrough point to find ways to effectively improve the information literacy of the elderly in rural areas. In order to deeply understand the current situation, needs and challenges of the elderly in digital learning, and to evaluate the operation effect and influencing factors of the elderly learning team. The research team used question-

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naires and follow-up interviews as the main research methods. By collecting the real feedback and opinions of the elderly, the design and implementation strategy of the intelligent development path of the elderly learning team will be further optimized, so as to improve the service quality and efficiency of the learning team, and build a bridge for the elderly to the digital world, so as to jointly promote the prosperity and development of education for the elderly.

With the increasing trend of population aging in the world, how to help the elderly to cross the Digital Divide and improve the digital ability of the elderly has gradually become a focus of academic research. Based on the Scopus database search, a total of 343 related papers were found. After analysis, it is found that the current international research on the "digital ability improvement of the elderly" mainly focuses on daily life, social participation, their own conditions, technical training, peer communication and other aspects. After research, Korean scholar Lee Ho-zhe believes that the life satisfaction of the elderly is significantly and positively correlated with digital access, digital capacity and digital utilization [2]. The sense found that South Korea is in a rapid digital society and increasingly aging population intersection, digital health literacy enables the elderly to maximize the effective use of emerging digital technology to ensure health and improve the quality of life [3]. Park Yu-jin and Zhang Soon-ju conducted a regression analysis on the data from the National Survey of Korean Elderly (9,920 participants), and found that agediscrimination experience and digital literacy are important predictors of social participation [4]. Dario Pizizur et al. jointly proposed that one of the most suitable methods of digital education for the elderly seems to be peer education [5]. Mei Ying suggested from the digital application ability of the elderly that the digital literacy level of the elderly will affect their perceived usefulness of mobile banking services [6]. Claudia suggests that the elderly are the group with the largest digital divide, so their digital literacy is important to improve their retirement conditions [7]. According to Lisa M, there are differences in technology adoption and use among older people, and even greater differences among lower-income older people [8]. Jacqueline proposed practical guidelines for creating effective technical training programs that enable older people to live more connected, more independent and richer lives [9]. El-bath Sasha et al. found that older people are increasingly relying on technology to connect and communicate with others around the world [10]. However, the international research lacks the experience of the elderly learning community, that is, the construction of the learning team for the elderly, so this has become the bottleneck of the development of the international elderly education research. This study is based on the unique and advanced development experience of the elderly learning team in Shanghai, from learningStart with the Digital Ability of the team to explore the improvement path of the learning team.

Up to now, the research experience in China (mainly the

reports from Shanghai) is as follows: The domestic research mainly focuses on the perspective of elderly learning team, learning activities and experience, management and radiation, and forms relevant discussions. First, their own development perspective. Elderly learning team is a new model of learning for the elderly that is "quietly emerging" and booming [11]. Developing education for the elderly and realizing it is an effective means to transform the aging population from social burden to social resources [12]. The elderly can improve their happiness through learning, but also can develop their physical resources to reduce the social burden. The elderly learning community (elderly learning team) is an important way to realize the elderly learning and improve the learning effect. The elderly learning community is a learning group organized based on the interests of the elderly, which can meet the diverse needs of the elderly [13]; second, the perspective of learning activity experience. Team learning for the elderly is a way of self-education and learning [14]. Lin Dandan emphasizes the connection between team learning for the elderly and "community learning". She points out that community learning refers to the lessons of individuals by using or creating learning resources in team learning activities [15]. In the aspect of team cultivation path, Wei Yaming et al. pointed out that cultivating and establishing a community-based learning team for the elderly can effectively alleviate the contradiction between supply and demand of elderly education to meet the learning needs of elderly residents, and improve the learning ability and life quality of elderly residents [16]. third, the perspective of management and radiation influence. Luo Liyang emphasized the team management mode from the perspective of the teams rules and regulations. He said that the breakthrough changes in the learning team for the elderly are reflected in the improvement of learning quality, the formulation of learning norms, the expansion of learning practice and the improvement of the team structure [17]. Luo Yuhua proposed from the perspective of guidance and support that supporting the learning team for the elderly is an important choice to break through the bottleneck of the development of education for the elderly [18]. Chinese scholars, starting from the three aspects of their own development, learning activity experience, management and radiation, discussed the important role of cultivating the learning team for the elderly in the process of crossing the digital divide. These studies also show that the development path of the learning team can be developed from the perspective of team guidance, the experience of first-level management and radiation of learning activities, which can play a good role.

To sum up, the digital learning model with the elderly learning team (learning community) as the carrier is an important channel to improve the life satisfaction of the elderly, promote the development of education for the elderly, and alleviate the aging of society. Related studies also show that upper-level guidance, digital skills training, social activity implementation, peer communication and mutual assistance

can play an important role in improving the digital ability of the elderly learning team. In view of this, combined with the existing research conclusions and relevant literature, the following assumptions are proposed:

Hypothesis 1: The own conditions of the elderly learning team members will affect the development of digital ability in the elderly.

Hypothesis 1a: The better the members own conditions, the higher the digital ability of the elderly.

Hypothesis 1b: The worse the members own condition, the lower the digital ability of the elderly.

Hypothesis 1c: There is no correlation between the members own condition and the digital ability.

Hypothesis 2: Course learning and activity experience guided based on the district level will have a significant impact on the Digital Ability of team members.

Hypothesis 3: The improvement of the digital ability of the elderly learning team can play a good radiation effect on the elderly around them.

2. Research Design

2.1. Design of the Questionnaire

This questionnaire is based on the learning experience scale [19], digital survival ability scale [20], also in Shanghai Open University residents lifelong learning monitoring research center project team established residents digital learning ability monitoring index framework, and combined

with the basic distribution of C elderly learning team status and activity of the original item and expression, the questionnaire contains basic information demographics, team activity basic situation, digital cognitive survey learning, digital learning status and digital ability assessment. This questionnaire included 4 items and 16 questions, using Likert scale to assign the variables. Table 1 shows the coding situation of the main variables in the questionnaire design process. Among the gender variables, "1= male" and "2= female"; age is divided into three stages: "1=51-60 years old", "2=61-70 years old" and "3=70 years old and more"; educational level, "1= middle school and below", "2= high school", "3= junior college", "4= undergraduate" and "5= graduate". The range corresponds to 18 towns in District C, indicated by numbers 1 to 18. Among the team types, "1= health education", "2= practical skills", "3= civic education", "4= sports and fitness", "5= cultural literacy" and "6= artistic accomplishment". In the evaluation of the learning activity experience and digital ability, the learning activity experience ranges from "1= very dissatisfied" to "5= very satisfied"; digital creation ability, numberWord learning ability, digital acquisition ability, digital communication ability, digital protection ability and digital application ability have all changed from "1= completely inconsistent" to "5= very consistent"... this coding method lays the foundation for data statistical analysis and research conclusions. By calculating the relevant mean, a new variable of learning team members can be formed: "Personal Conditions", "Learning activity experience" and "Digital Ability".

Table 1. Encoding of the primary variables.

Variable name	Short-cut process	Variable interpretation
Sex	1-2	1= male; 2= female
Age	1-3	1 – 3 were 51 – 60, 61– 70, and over 70, respectively
Degree of education	1-5	1-5 are junior high school and below, senior high school, junior college, undergraduate, graduate students
Number of team participation	1-5	1 – 5 correspond to 1, 2, 3, 4, 5 and more, respectively
Motion frequency	1-5	1-5 correspond to 1-2, 3-4, 5-6, 7-10, and more than 10 times, respectively
Learning activity experience	1-5	From 1 "totally dissatisfied" to 5 "very satisfied"
Digital creation ability	1-5	From 1 "totally not fit" to 5 "perfectly fit"
Digital learning ability	1-5	From 1 "totally not fit" to 5 "perfectly fit"
Digital acquisition ability	1-5	From 1 "totally not fit" to 5 "perfectly fit"
Digital communication ability	1-5	From 1 "totally not fit" to 5 "perfectly fit"
Digital protection ability	1-5	From 1 "totally not fit" to 5 "perfectly fit"
Digital application ability	1-5	From 1 "totally not fit" to 5 "perfectly fit"

2.2. Interview Design

In order to more deeply verify the accuracy and authenticity of the information collected by the questionnaire, the research team decided to conduct a series of offline interviews with the core members and key members of the learning team participating in the questionnaire between September 11, 2024 and September 21, 2024. These interviews aimed to gain more direct and in-depth insights to provide a comprehensive and detailed understanding of the overall situation of the learning team. Based on a comprehensive analysis of the study team, the study team carefully designed the Interview Outline of Senior Study Team Leaders in District C, which covers three main dimensions and eight key elements. Table 2 shows the three major interview dimensions and eight elements in the design process of the interview outline for the leaders of the elderly learning teams. These three dimensions are respectively "basic information of the learning team", "learning team activities" and "intelligent activities of the

learning team". Through these dimensions, the research team hopes to fully grasp the basic composition of the learning team, the development of daily activities, and the implementation effect of intelligent activities. During the interview, the research team conducted in-depth communication and discussion on the outstanding representatives of the learning team in District C in the way of different time periods and batches. Through this orderly interview arrangement, the research team was not only able to ensure that each respondent had enough time and space to express their views and experiences, but also that the collected information collected was highly representative and reliable. Through these well-planned and implemented interviews, the research team expects to obtain valuable first-hand information that will be crucial to the accuracy and depth of the study results. At the same time, these interviews will also provide strong data support and practical guidance for the further development of the elderly learning team in District C.

Table 2. List of interview elements of the head of the elderly learning team in District C.

Interviews dimension	Interview elements
Essential information	1) Background of the team leader 2) Team star-level team construction situation 3) Transformation of team intelligent learning student team
Activity situation	1) Team activity content, activity location and activity cycle 2) Team growth process
Smart activities	1) Digital learning situation of team members 2) Team network radiation situation 3) Team community and social wisdom services

3. Research Finding

Taking "questionnaire star"(application software) as the carrier, the research group distributed questionnaires online in 18 towns in C District of S City. A total of 1,848 questionnaires were collected, among which as many as 1,792 were valid ones. The effective recovery rate of the questionnaires was 96.97%. In order to ensure the validity of the questionnaire survey, the monitoring was conducted by online stratified sampling method. On the basis of comprehensive consideration of the differences in population, neighborhood committees, learning distance and other factors, combined with the characteristics of the community environment around different points, such as different population structure and density, industrial characteristics, distribution of cultural and educational resources and other factors, community activity centers and community schools are preferentially selected as the main

points. Seven elderly learning teams were also followed up to support the follow-up analysis.

3.1. Accuracy and Reliability Detection of Relevant Data

It is very important to analyze whether there is a linear regression relationship among the variables in the learning process, which is very important to study the development of learners learning ability and the influencing factors [21]. Testing for a linear correlation between variables is an important prerequisite and foundation for regression analysis. This is because the core purpose of regression analysis is to explore the degree and mode of one or more independent variables on the dependent variables, and this influence relationship is often based on the existence of some linear or non-linear relationship between the variables. If there is no correlation between the variables, then performing the regression analysis loses its practical significance. Thus,

accurately identifying and quantifying correlations between variables is crucial for subsequent analyses.

Table 3. Reliability analysis of six digital abilities.

Cronbach Confidence analysis			
Name	Corrected Item-Total Correlation (CITC)	Item Deleted Coefficient α	Cronbach Coefficient α
1. Digital creative ability	0.617	0.850	0.864
2. Digital learning ability	0.754	0.823	
Digital acquisition ability	0.768	0.821	
4. Digital communication ability	0.603	0.850	
5. Digital protection ability	0.595	0.851	
6. Digital application ability	0.627	0.846	
Note: Standardized Cronbach Coefficient α = 0.865			

Reliability analysis is used to study the reliable response accuracy of the quantitative data, especially the attitude scale questions [22]. Table 3 presents the six digital ability reliability analysis. With the help of SPSSAU data analysis platform, the analysis found that the reliability value of the research data is higher than 0.8, which comprehensively shows that the data reliability quality is high and can be used for further analysis. The common degree value corresponding to all study items is higher than 0.4, indicating that the study item information can be effectively extracted effectively. In addition, the KMO value is 0.879, greater than 0.8, the data can be effectively extracted information. In addition, the variance interpretation rate value for each factor is 60.057%, and the cumulative variance interpretation rate after rotation is 60.057% > 50%. It

means that the amount of information can be effectively extracted. Performing the Bartlett sphericity test validity analysis [23], the corresponding p-value is also less than 0.05. It shows that the relevant series data is very suitable for information extraction, which shows good validity from one side. The results of collinearity analysis using Pearson correlation coefficient value: the absolute value between the correlation coefficient between the other five is less than 0.8; the absolute value between the four and the other four is less than 0.8; the absolute value between the other three is less than 0.8; the absolute value between the other two is less than 0.8; For the Digital protection ability, the absolute correlation coefficient between the other item is less than 0.8. This indicates that there is no covariance problem.

Table 4. Analysis of the six ability collinear problems.

Collinearity Diagnostics		
Item	VIF Price	Tolerance (Tolerance)
1. Digital creative ability	1.699	0.589
2. Digital learning ability	2.573	0.389
3. Digital acquisition capability	2.627	0.381
4. Digital communication ability	1.611	0.621
5. Digital protection ability	1.589	0.629
6. Digital application ability	1.698	0.589

Table 4 shows the data related to the analysis of the six digital ability covariate problems. The six digital abilities VIF values

were tested, and the values were 1.699, 2.573, 2.627, 1.611, 1.589, 1.698 which were all lower than the strict standard $VIF < 5$, and the tolerance of 0.589, 0.589, 0.389, 0.381, 0.621, 0.629 and 0.589 were also lower than the strict standard tolerance > 0.2 , indicating that there is no collinearity problem.

Based on the above data analysis, the study data meet the criteria of statistical significance and can be used for further analysis.

3.2. Overall Analysis of Digital Ability

Shown in Table 5 are the overall digital ability means as

Table 5. Descriptive statistics of the Digital Ability of the elderly members.

Primary dimension	Mean (M)	Secondary Dimension	Mean (M)
Digital ability	3.81	Digital creation ability	3.46
		Digital learning ability	3.8
		Digital acquisition ability	3.92
		Digital communication ability	3.94
		Digital protection ability	4
		Digital application ability	3.76

Further analysis shows that the members of the elderly learning team in District C are the weakest in digital creation ability, which mainly reflects the weak application ability of related smart phone APPs such as TikTok. While the average value of digital learning ability is higher than that of digital creation ability, it shows a certain learning adaptability. Older team members performed well in digital acquisition ability and digital communication ability, indicating that they could make better use of digital technology in information acquisition and interpersonal communication. In addition, they performed well in the digital protection ability, reaching the highest average score of the six items, showing a strong sense of network security. Finally, in terms of digital application ability, the average score of 3.76 points, that they are only preliminary to digital technology applied in daily life and travel, combined with the digital creation ability mean minimum comprehensive analysis, shows the elderly team members in higher complexity of smartphone application learning and use is still large rising space.

3.3. Analysis of the Correlation Between Members Personal Conditions and Digital Ability

The research group used the following variables with the mean — education level, the number of team participation

well as the six digital ability means for the older learning team members. The average digital creation ability of the elderly is 3.46, digital learning ability is 3.8, digital acquisition ability is 3.92, digital communication ability is 3.94, digital protection ability is 4, and digital application ability is 3.76. The average overall digitization capability of 3.81 is above average. That is, digital protection ability $>$ digital communication ability $>$ digital acquisition ability $>$ digital learning ability $>$ digital application ability $>$ digital creation ability, the average is slightly lower than the theoretical average of 4, the overall situation is general or good.

and the frequency of activities to form a new variable "Personal Conditions". The variables were further analyzed, with "digital ability" as the ordinate and "personal conditions" as the abscissa, and the distribution trend between the two was drawn based on the scatter plot of SPSSAU platform. Figure 1 shows the relationship between the "Personal Conditions" variable of the members of the elderly learning team and their digital ability. This scatter plot shows the relationship between a members own condition and Digital Ability. As can be seen from the figure, the members themselves conditions and digitization capabilities are presented on two axes. Moreover, the scatter of the two are mostly distributed in the [3, 4] interval of the first quadrant, that is, between "average degree (frequency)" to "high degree (frequency)" and "general" to "somewhat consistent". The scatter distribution in the figure shows the performance of the different members in these two aspects. Through calculation, the potential association between members own conditions and Digital Ability can be analyzed. The linear fitting formula of the scattered data is: Digital ability = $-0.022 + 1.192 * \text{Personal Conditions}$, and the R square value is 0.293. These scatter are distributed around the diagonal, showing an obvious positive correlation trend, that is, with the improvement of members own conditions, the digital ability also improves. Therefore, hypothesis part 1 holds. Hypothesis 1b, hypothesis 1c are wrong, and hypothesis 1a is correct.

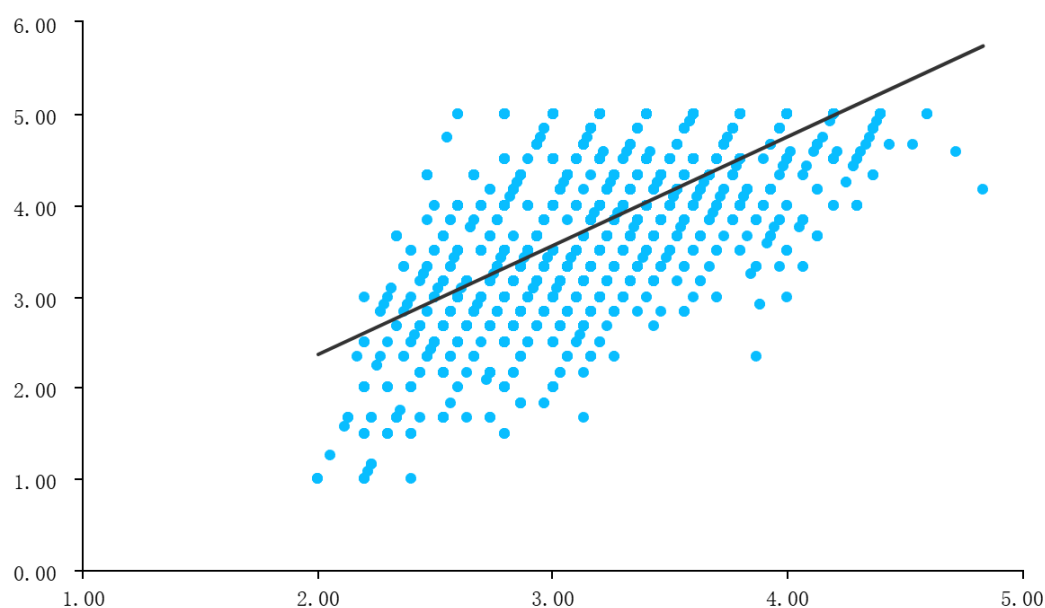


Figure 1. Scatter plot of the members Personal Conditions and Digital Ability.

3.4. The Correlation Analysis Between Learning Activity Experience and Digital Ability

Table 6. Coranalysis of learning activity experience and six digital abilities.

Variable	Analysis Items	Digital creation ability	Digital learning ability	Digital acquisition ability	Digital communication ability	Digital protection ability	Digital application ability	Total value of Digital Ability
Learning activity experience	Correlation	0.301	0.272	0.293	0.323	0.306	0.205	0.283
	VIF price	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	Tolerance	1.000	1.000	1.000	1.000	1.000	1.000	1.000
	D-W price	2.010	1.919	1.938	2.014	2.009	1.841	1.926
	F price	80.448	84.625	105.800	133.853	120.343	40.789	155.218

* $p < 0.05$ ** $p < 0.01$ *** $p < 0.01$ (source: collated by SPSSAU)

The research group took the course class and municipal (district) activities that the elderly members participated in (had participated in) as the independent variables, and took six digital abilities as the dependent variables. After the identification of the data model, all the relevant factors entered the data model, reaching the effective standard of the regression model, and the T-test of the relevant independent variables reached the significance level. Table 6 shows the correlation analysis between the variable "Learning activity experience" and the six digital abilities. According to Pearson's correlation analysis, the learning activity experience is positively correlated with the six dimensions of digital ability, with a correlation coefficient between 0.2 and 0.4. The results of the correlation test show that the experience of learning activities of the elderly members is closely related

to the digital ability. In order to explore the influence degree of the course learning activity experience and digital ability. This study conducted a regression analysis of learning activity experiences and all dimensions. The VIF value and tolerance of the following regression model are higher than 0.2, which meets the requirements, indicating that the relevant data characteristics between the variables meet the collinearity discrimination criteria, that is, there is no collinear problem, and the relevant data are available for further analysis. The D-W values are between [1.9-2.1]. It should be noted that the D-W value, referring to the value of the Durbin-Watson statistic, is a method for testing the first-order autocorrelation of the residuals in the regression analysis. D-W values range between 0 and 4:0 indicates positive autocorrelation, 4 indicates negative autocorrelation, where

value 2 is the ideal value [24]. The D-W values detected by the research team are between [1.9-2.1], which indicates that the model is well constructed and the autocorrelation be-

tween the residuals of the data is small. that is, the observed data is independent and meets the requirements of multiple linear regression [25].

Table 7. Linear regression analysis of the learning activity experience and six digital abilities.

Argument	Dependent Variable	Non-standardized Coefficients		Standard Coefficient β	t	Model Summary Statistics	
		Regression Coefficient B	Standard Error SE			Adjust R ²	F price
Learning activity experience	Digital creation ability	0.301	0.034	0.207	8.969	0.042	80.448
	Digital learning ability	0.272	0.030	0.212	9.199	0.045	84.625
	Digital acquisition ability	0.293	0.029	0.236	10.286	0.055	105.800
	Digital communication ability	0.323	0.025	0.264	11.569	0.069	133.853
	Digital protection ability	0.306	0.028	0.251	10.970	0.062	120.343
	Digital application ability	0.205	0.032	0.149	6.387	0.022	40.789
	Total value of Digital Ability	0.283	0.023	0.282	12.459	0.079	155.218

Table 7 further analyzes the linear regression of the variable "Experience of learning activities" on the six digital abilities of older learning team members. As can be seen from the data, The regression coefficient B of the learning activity experience on the digital creation ability was 0.301, The t-value was 8.969, Adjusted R² to 0.042; The regression coefficient B for digital learning ability is 0.272, The t-value was 9.199, Adjusted R² to 0.045; The regression coefficient B for the digital acquisition ability was 0.293, The t-value was 10.286, Adjusted R² to 0.055; The regression coefficient B for digital communication ability was 0.323, The t-value was 11.569, Adjusted R² to 0.069; The regression coefficient B for the digital protection ability is 0.306, The t-value was 10.970, Adjusted R² to 0.062; The regression coefficient B is 0.205, The t-value was 6.387, Adjust R² to 0.022; The regression coefficient B for the total value of Digital Ability is 0.283, The t-value was 12.459, Adjusted R² was 0.079. These data show that the learning experience and present positive correlation between the digital ability, namely with the increase of learning experience, digital creation, digital learning, digital acquisition, digital communication ability, digital protection, digital application ability and Digital Ability have different degree of ascension. Among them, the learning activity experience has a relatively large influence on the digital communication ability, with the standard coefficient β being 0.264 and the t-value being as high as 11.569. Overall, the learning activity experience is partly relevant to the development of Digital Ability play an active promotion work.

It can be seen from the above table that the learning activity experience is analyzed as the independent variable and

the digital ability (total value) as the dependent variable. The model formula is: Digital Ability = 2.642 + 0.283 * Learning activity experience, and the square-value of the model R is 0.080, which means that the learning activity experience can explain 8.0% of the change of digital ability. In the F test, the model found that the model passed the F test (F=155.218, p=0.000 <0.05), that is, it means that the learning activity experience must have an impact on the digitization ability. The final specific analysis shows that the regression coefficient value of the learning activity experience was 0.283 (t=12.459, p=0.000 <0.01), which means that the learning activity experience will have a significant positive impact on the digitization ability. Combined with the questionnaire survey results and the above analysis, it was found that the six basic abilities of the members who had participated in the course classes organized by the senior university or adult school and learning activities were higher than those of the elderly learning team members who did not participate in learning activities, and there was an obvious positive relationship between learning activity experience and digital ability.

Therefore, hypothesis 2 holds.

3.5. Interview and Case Evidence

In the case follow-up interview survey, the research team selected seven typical teams from health education, practical skills, civic education, sports and fitness, cultural literacy, and artistic accomplishment, and recorded interviews in the main places of team activities, team alliance meetings and

other places, and formed 7 interview cases. Table 8 describes the intelligent development situations of the seven major learning teams in three aspects, namely course activity evaluation, digital ability description, and service and radiation. After sorting, it was found that each learning team maintained a positive attitude towards the relevant courses, activities and other experiential activities guided by the district level. During the interview, the attitude of the seven learning teams was positive, willing, fresh, interesting, enthusiastic, happy, bliss, common language, no estrangement, broad interests and so on. This also once again confirms the positive effect of learning activity experience led by the district level organization in hypothesis 2.

In addition, each team also carries out service and radiation activities in its own forms and channels, gradually expanding

the improvement of information literacy. The Yingxin Dance learning team enthusiastically teaches digital knowledge in the form of "one-to-one" and "one-to-many". The Yingshan Red Opera Art team focuses on teaching digital life skills to the elderly in the community. Figure Time learning team, Xiang Ying Farmhouse learning team and New Creative Handcraft learning team teach knowledge through TikTok video sharing, WeChat live broadcast and other network radiation methods. The Happy Plus learning team mostly adopts the form of community service guidance, such as helping the elderly to make an appointment and register. Members of the Third Life Learning team (note: "Third Life" refers to the new life of cancer patients) to provide digital services for special groups. These radiative actions also prove that assumption 3 holds true.

Table 8. List of the wisdom development of the main learning teams.

Learning Team Name	Evaluation of Course Activities	Description of the Digital Ability	Service and Radiation
Ying Xin Dance	Positive, willing to	Good digital communication; Digital creative ability is mediocre	"One to one" and "one to many" form
Yingshan Red Opera Art	Fresh and interesting	Good digital application ability	Closely teach the elderly about digital life skills
Figure Time	Enthusiasm and high enthusiasm	Outstanding digital creation ability	Teach other old people about digital creation
Happy plus	Happy, bliss	Digital communication ability is outstanding	Community service, help to make appointments
Third Life	Common language, no estrangement	Digital access capability is outstanding	Special population digital services
Xiang Ying Farmhouse	Positive, with a wide range of interests	Outstanding digital creation ability	Implement the digital service mode of "Responsible Person-Member-Residents"
New Creative Handcraft	Also teachers and friends, grow up together	Excellent digital acquisition ability and digital creation ability	Radiation influence in the way of "WeChat Live Broadcast"

4. Conclusion and Suggestion

4.1. Study Conclusions

After study, it is found that the conditions of the elderly learning team in District C will have a positive impact on their digital ability. The higher the education level and the more active the team is, the higher the digital ability; The digital ability of the elderly learning team members is at the above average level, digital communication ability and digital protection ability are relatively excellent, and digital application ability are relatively weak. Member course learning activities experience good participation and positive response.

The district-level experiential actions of related courses and large-scale activities can promote the digital ability of the elderly learning team members, including the digital communication ability of the elderly learning team. In the process of improving the digital ability, the actions and tendencies of the excellent team members, the elderly in the community, and the elderly Internet users.

4.2. Relevant Suggestions

4.2.1. Actively Absorb and Cultivate the Elderly Learners with Their Own Excellent Conditions

It is recommended that older learners with high literacy

levels, stable financial resources, ample free time, and high motivation be recruited as team learners. These older learners have excellent performance in the six basic digital abilities and can be easily trained to become the backbone of the learning team. By absorbing and cultivating them to become the core of the team, they can not only lead the whole learning team to rapidly improve their digital literacy and promote the transformation of the learning team into an intelligent learning support team, but also occupy a central position in the digital learning radiation network, create a positive team digital learning atmosphere, and form a good situation of digital radiation leadership.

4.2.2. Strengthen the Guiding Force in Courses and Activities

Focusing on the leadership and guidance at the city and county level, the team will further develop relevant digital learning courses and arrange relevant activity programs, so as to enhance the digital competence of the elderly learning team in course learning and activity experience. And according to the characteristics of various dimensions of digital literacy of senior members, the course content can be targeted. For the problem of weak digital creation ability, more courses can be set up on the use of digital creation tools and creation skills, such as "Learning smartphones for the elderly", "Playing with mobile phone shooting", In terms of activity design, some digital device experience and practical operation links can be added, so that the elderly team members can improve their digital skills in practical operation, and guide the elderly to gain digital skills in the learning experience of smart devices. At the same time, to improve the participation and enthusiasm of elderly members, the form of activities can be more diversified, such as smart learning scene experience interaction, digital education in the townships, etc.

4.2.3. Give Full Play to the Digital Learning Ability and Radiation Learning Ability of the Learning Team

Give full play to the active learning motivation of the team members themselves, stimulate the digital learning consciousness of the elderly members, and make them more active in the learning process. Encourage mutual learning among elderly members to form a positive learning atmosphere. Through "one-to-one", "one-to-many", "community participation", "network radiation" and other forms, in addition to the realization of In addition to the learning and mutual support mode of "older people" teaching "older people", it can also realize the implementation of assistance to older people in the surrounding living circle through the production of teaching videos by the learning team, webcasting, etc. The service targets include, but are not limited to, other team members, community seniors, and network elderly learners.

Abbreviations

CITC	Corrected Item-Total Correlation
APP	Application
SE	Standard Error
VIF	Variance Inflation Factor
D-W	Durbin-Watson

Author Contributions

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Conflicts of Interest

The author declare no conflicts of interest.

References

- [1] Wang Lu. Study on the influencing factors of health information literacy in the elderly [D]. Henan: Zhengzhou University, 2021. <https://doi.org/10.27466/d.cnki.gzzdu.2021.004268>
- [2] Lee H. Analysis of the impact of digital literacy on life satisfaction (2019–2022) for older adults in South Korea: a national community-based panel study [J]. Scientific Reports, 2024, 14(1): 20399-20399. <https://doi.org/10.1038/S41598-024-71397-0>
- [3] Kyaw Y M, Aung N M, Koyanagi Y, et al. Sociodigital Determinants of eHealth Literacy and Related Impact on Health Outcomes and eHealth Use in Korean Older Adults: Community-Based Cross-Sectional Survey [J]. JMIR aging, 2024, 7e56061. <https://doi.org/10.2196/56061>
- [4] Park Y, Chang J S. The impact of ageism experiences on social participation among community-dwelling older adults: Exploring the moderating role of digital literacy [J]. Geriatric nursing (New York, N. Y.), 2024, 59372-378. <https://doi.org/10.1016/J.GERINURSE.2024.07.029>
- [5] Pizzul D, Sala E, Caliendo A, et al. Evaluating the impact of a peer-education digital literacy course on older adults digital skills and wellbeing: a mixed-methods study protocol [J]. Frontiers in Sociology, 2024, 91432607-1432607. <https://doi.org/10.3389/FSOC.2024.1432607>

- [6] Mei Y. Exploring the mechanisms driving elderly Fintech engagement: the role of social influence and the elderly's digital literacy [J]. *Frontiers in Psychology*, 2024, 151420147-1420147. <https://doi.org/10.3389/FPSYG.2024.1420147>
- [7] Dajer C M C, Calzaretta V R A, Landa U S, et al. Impact of a culturally adapted digital literacy intervention on older people and its relationship with health literacy, quality of life, and well-being [J]. *Frontiers in Psychology*, 2024, 151305569-1305569. <https://doi.org/10.3389/FPSYG.2024.1305569>
- [8] Miller S M L, Callegari A R, Abah T, et al. Digital Literacy Training for Low-Income Older Adults Through Undergraduate Community-Engaged Learning: A Single Group Pre-Post Study. [J]. *JMIR aging*, 2024. <https://doi.org/10.2196/51675>
- [9] McGintyJ, OestJ, DividoJ. Digital immigrants: Leveraging the technology acceptance model to increase digital literacy in older adults [J]. *New Directions for Adult and Continuing Education*, 2024, 2024(181): 9-18. <https://doi.org/10.1002/ACE.20517>
- [10] Sasha E, Johanna G, Kaotar E, et al. Evaluation of a virtual 4-week digital literacy program for older adults during COVID-19: a pilot study [J]. *Educational Gerontology*, 2024, 50(4): 296-303. <https://doi.org/10.1080/03601277.2023.2268499>
- [11] Xu Benren. Class without classroom —— Shanghai Senior Citizens Study Team Activity Tour [J]. *Success and Employment*, 2013, (19): 14-17.
- [12] Song Wei. The Geriatric Learning Team Functional Study [D]. Tutor: Huang Jian. East China Normal University, 2016.
- [13] Su Jiao-yan. Research on the construction of elderly learning community under the perspective of aging [D]. Tutor: Li Guang. Shanxi University, 2023. <https://doi.org/10.27284/d.cnki.gsxiu.2023.001220>
- [14] Yue Yan. Retirement spirit: a multi-case study of role recognition led by the Shanghai elderly learning team [D]. Tutor: Huang Jian. East China Normal University, 2021. <https://doi.org/10.27149/d.cnki.ghdsu.2021.000054>
- [15] Lin Dandan. Community learning promotes elderly identity study [D]. Tutor: Huang Jian. East China Normal University, 2021. <https://doi.org/10.27149/d.cnki.ghdsu.2021.001872>
- [16] Wei Yaming, Li Weimin. Strategies for fostering and creating community-based aged learning teams [J]. *Contemporary Continuing Education*, 2021, 39(1): 53-58.
- [17] Luo Liyang. Study on Elderly Learning Team Growth in Shanghai [D]. Tutor: Gao Zhimin. East China Normal University, 2019.
- [18] Luo Yuhua. The elderly learning team Growth Study [D]. Tutor: Sun Meilu. East China Normal University, 2014.
- [19] Zhang Wenlan, Li Shasha. Development and Inspection of the Online Course Learning Experience Scale [J]. *Modern Educational Technology*, 2021, 31(02): 65-72.
- [20] Li Chun, Liu Junqiang. Design and application of the digital viability scale —— Take Heilongjiang Province as an example [J]. *Education Informatization in China*, 2014, (14): 38-40.
- [21] Counts E G. Unique Multiple Linear Regression Problems for Each Student [J]. *The Journal of Experimental Education*, 2015, 44(3): 24-27. <https://doi.org/10.1080/00220973.1976.11011533>
- [22] Eisinga R, Te Grotenhuis M, Pelzer B. The reliability of a two-item scale: Pearson, Cronbach, or Spearman-Brown? [J]. *International Journal of Public Health*, 2013, 58(4): 637-642.
- [23] Hung R H, Kim B S, Abreu J M. Asian American multidimensional acculturation scale: development, factor analysis, reliability, and validity. [J]. *Cultur Divers Ethnic Minor Psychol*, 2004, 10(1): 66-80.
- [24] Barassi M R. *Microeconometrics; Methods and Applications* by A. Colin Cameron; Pravin K. Trivedi [J]. 2005.
- [25] Sun Dao-de. Selection of the Linear Regression Model According to the Parameter Estimation [J]. *Wuhan University Journal of Natural Sciences*, 2000, 5(4): 400-405. <https://doi.org/10.1007/BF02850764>

Biography



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Research Field

Lu Wenfu: Lifelong Education, Metaverse Education, Brain-wave Detection and Education Research, Community Governance Education Program Development