Journal of Theoretical and Applied Information Technology
31st January 2024. Vol.102. No 2

ISSN: 1992-8645 www.jatit.org E-ISSN: 1817-3195

FROM THEORY TO PRACTICE: UNDERSTANDING THE FACTORS AFFECTING THE DEVELOPMENT OF DIGITAL COMMUNITY EDUCATION IN CHINA.

SITI SARAH MAIDIN[1], LIU FAN[2], SIMON LAU BOUNG YEW[3]

[1,2]FDSIT, INTI International University, Nilai, Malaysia

[3]Senior Technical Consultant. Quandatics Academy, Kuala Lumpur, Malaysia

E-mail: [1]sitisarah.maidin@newinti.edu.my, [2]I21021456@student.newinti.edu.my
[3]simon.lau@quandatics.com

ABSTRACT

Digital community education in China is still in the development stage, with large regional differences and a low penetration rate. There is a lack of empirical studies on the influencing factors of the development of digital community education. This study investigates the use of digital community education online platform by Jinan residents, exploring the influencing factors, namely the residents use intention, education platform, education resources, team construction and the national government. A model of the influencing factors is established, and hypotheses about the relationships among the factors are made and validated using a structural equation model. The results provide a scientific basis for the proposed development strategy of digital community education, and recommendations are proposed for residents, platform resources, and national government to explore new paths for the development of digital community education. This study contributes to the understanding of digital community education development and provides practical implications for its improvement.

Keywords: *Digital Community Education, Influencing Factor, Empirical Study,*

1. INTRODUCTION

Digital community education refers to the use of modern information technology to disseminate quality educational resources to residents, allowing for convenient and efficient access to educational services. This type of education is crucial in promoting the construction of a learning society, as it provides lifelong learning opportunities that break down constraints of time, place, and age. The literature highlights the importance of digital community education in improving the overall education level of the population, keeping people up to date with the latest knowledge, and promoting active learning. However, academic research that identifies the factors influencing the development of digital community education is still lacking in China. Therefore, this paper aims to expand the research field of community education by conducting an empirical study to identify these factors and provide a reference for the development of digital community education.

Digital community education is the dissemination of quality educational resources to residents with learning needs through community education platforms. It uses modern information technology to form a learning society consisting of communities, enabling residents to freely dispose of their learning time, making educational services available in multiple forms, and allowing for the rational allocation of educational resources. Digital community education breaks down the constraints of time, place and age, making learning intertwined with our lives. It is effective in keeping people responsive to the times and turning passive learning into active acceptance. While digital community education has been extensively researched, academic research attempting to identify the relationship between influencing factors and the development of digital community education is still lacking, especially within the context of China. Therefore, an empirical study using data measurement is anticipated to expand the research field of community education and provide a reference for the development of digital community education. [1][2][3][4].

2. RESEARCH PROBLEM

At present, the development of digital community education in China is still in its early stages, with low penetration rates and regional disparities. Current research on the influencing factors of community education in China is mainly theoretical, with few empirical studies [5].

As such, there is a need for further empirical research to identify the factors that affect the development of digital community education in China. In this regard, this paper establishes a structural equation model of the influencing factors of digital community education and conducts an empirical study using data measurement in order to expand the research field of community education with a view to providing a reference for the development of digital community education. Based on the studies in the literature [6][7], the five key influencing factors, namely the residents use intention, education platform, education resources, team construction, and the national government are put forward for testing in this paper.

3. LITERATURE REVIEW

In this section, literature on digital community education from both a Chinese and global viewpoint, as well as the factors that influence digital community education is investigated. The main question this student wants to answer through this literature review is “What is the gap in digital community education in China”

Globally, community education was developed from Dewey's idea of school as the foundation of society [8]. Community education originated in the West, developed in Europe, and later spread to Southeast Asia and Latin America [1]. Most countries have their own interpretations of community education based on their own development, such as "mass education is community education" and "social education is community education" [5].

In China, most of the definitions of community education emerged from early studies since the mid-1980s, but because the understanding of community education was not comprehensive at that time, researchers put forward understandings with different focuses. As research on community education in China progressed, a consensus was largely reached that it was more appropriate to define it as an educational activity. In China, digital community education is a rapidly growing field that is projected to play an increasingly larger role in the future especially in knowledge sharing. Online courses, interactive webinars, and online forums for peer discussion are some of the fundamental aspects of digital community education in China [18]. Tsinghua University in Beijing, for example, provides e-college courses through its online platform, including courses in digital engineering and technology [19]. In recent years, China has seen substantial growth and development in digital community education. With the increased adoption of the internet and digital technologies, online platforms have become critical in the provision of educational resources and the development of learning communities. The massive open online course (MOOC) platform XuetangX is a renowned example of digital community education in China. Founded in 2013, XuetangX provides a diverse choice of courses from China's top universities and institutions. These courses span a wide range of topics, including science, technology, humanities, business, and others. Students can take the courses for free or pay to receive a certificate of completion. XuetangX has amassed millions of users and has established itself as a popular platform for lifelong learning [22].

Another noteworthy endeavor is the creation of online learning communities known as "zhihuishu." These communities provide a venue for students to interact with one another as well as with skilled teachers. To provide a compelling learning experience, Zhihuishu integrates live-streamed lectures, discussion forums, and interactive features. Students can ask questions, participate in debates, and access study resources all within the context of a digital community. Social media platforms such as WeChat and Weibo, in addition to these, have become key means for digital community education in China. Many educational institutions, teachers, and organizations use these platforms to distribute educational information, provide course or workshop updates, and stimulate learner interactions [20][21][22].

Moreover, the Chinese government has recognized and actively promoted the growth of digital community education. To promote the integration of technology into the educational system, initiatives such as "Internet + Education" have been created. This has resulted in greater investment in educational technology startups as well as the development of favorable regulations to foster innovation in the industry.

However, while digital community education in China has grown significantly, it also operates within the larger context of internet control and restriction in the country. Certain subjects or discussions may be banned or controlled on online platforms due to tight content standards and oversight. This can have an impact on the accessibility and openness of educational resources and conversations in online communities.

Overall, digital community education in China has emerged as a potent instrument for increasing educational access, building learning communities, and encouraging lifelong learning. It is projected to continue playing an important role in China's educational landscape with the continued growth of technology and the government's backing.

Currently, research on digital community education in China is still in the exploration stage. [3], among others, proposed that digital community education is a learning society composed of communities that use modern information technology as a tool. The goal of digital community education is to enable residents to freely allocate their learning time and access education services in multiple forms, making it more convenient, faster, and accessible. The objective is to rationalize the allocation of educational resources to optimize the provision of education services in various forms.

[10] proposed factors influencing digital community education such as resource construction, users' information literacy, residents' willingness to learn digitally, and promotion and publicity efforts; [17] outlined influencing factors such as residents' learning needs, information literacy, resource construction, guarantee system, and talent team; [6] analyzed factors influencing digital community education such as organizational structure, service platform, resource development and utilization, and service management guarantee.

This research will investigate the progress of digital community education in China through a thorough examination of literature and theory. The study is conducted based on the following theoretical framework that comprises five independent variables, namely residents' willingness to use the education platform, availability of education resources, team building, and the role of the national government as shown in Figure 1 below.

Dependent Variable
Development of digital community education
Independent Variables:
1. Residents' willingness to use 2. Education platform 3. Education resources 4. Team building 5. National government

Figure 1: Theoretical Framework

The objective of this research is to conduct an in-depth exploration of the factors that affect the growth of digital community education in China using a quantitative approach. The purpose of this study is to identify the factors that influence the development of digital community education, and the study will measure the strength of each influencing factor. The hypotheses of this research are as follows.

- ✓ H1: Residents' willingness to participate positively influences the development of digital community education
- ✓ H2: Educational resources directly and positively influence the development of digital community education through the willingness of residents to participate
- ✓ H3: Educational platforms directly and positively influence the development of digital community education and indirectly influence the development of digital community education through residents' willingness to participate
- ✓ H4: Team building positively influences the development of digital community education
- ✓ H5: National government positively influences the development of digital community education

4. RESEARCH METHODOLOGY

The study will be conducted offline in a non-invasive environment that does not disrupt normal working procedures. The unit of analysis will be individuals who have studied or experienced digital community education, and the study will employ a cross-sectional quantitative approach. A sampling design based on non-probability sampling procedures will be used to collect data from a defined population, with 400 questionnaires to be distributed to increase the chances of collecting sufficient data. The data collection method will be through the offline distribution of questionnaires. The study will use a five-point Likert scale to measure all the latent variables and establish the degree of development of digital community

education. SPSS will be used to conduct exploratory factor analysis on the scale, and the results will be analyzed to establish the structural validity of the scale. The data from the questionnaire will be used to conduct a validation factor analysis of the measurement model, test the fit of the structural equation model, make corrections, and finally, derive the impact of each influencing factor on the development of digital community education based on path analysis.

4.1 Questionnaire Design

The questionnaire designed is a closed structured questionnaire, and respondents were asked to respond anonymously. The questionnaire consists of four parts: first, the introduction, which explains the reason and purpose of the survey, notes on the answers, and explains the concept of digital community education. The questionnaire then contains 45 questions, i.e., 45 measurable variables, corresponding to the ten variables of the relationship model: national government, residents' willingness to use, educational platform, team building, performance expectation, effort expectation, community impact, convenience, educational resources, and the current development of digital community education. In order to ensure the accuracy of the collected questionnaire data for a more scientific follow-up study, the researcher used a five-point Likert scale to develop the questionnaire. The questions were all single-choice, and each question contained five options, A, B, C, D, and E, which were "strongly disagree", "disagree", "neutral", "agree", and "agree" respectively, according to the respondent's level of agreement. The five options are "strongly disagree", "disagree", "neutral", "agree", and "strongly agree", and each of the five options is assigned a score of 1-5. The higher the score, the higher the residents' approval of the option, and conversely, the lower the score, the lower the approval.

The main part of the questionnaire consists of 45 questions, which correspond to ten variables: (1) 4 questions on the variable residents' willingness to use; (2) 4 questions on the variable national government; (3) 4 questions on the variable performance expectation; (4) 3 questions on the variable effort expectation; (5) 3 questions on the variable community influence module; (6) 4 questions on the variable convenience; (7) 4 questions on the variable educational platform; and (8) 6 questions on the variable educational resources. 6 questions for the variable educational resources; 6 questions for the variable team building; and 5 questions for the variable digital community education development. The questions of the actual distribution questionnaire were consecutively numbered, eliminating the modularity feature to ensure the continuity of the respondents' thinking and to improve the quality of the questionnaire responses. The corresponding design table of measurement variables prepared is shown in Table 1.

Table 1: Measures of factors influencing the development of digital community education

Potential Variables	Code	Measurable variables
Residents' willingness to use	XA1	I am willing to use the digital community education platform for learning.
	XA2	I am willing to recommend others to use the digital community education platform for learning.
	XA3	I will maintain the habit of using the digital community education platform for learning.
	XA4	If I need to learn something new, I will give priority to digital community education.
National government	XB1	There is strong government support and advocacy for digital community education.
	XB2	The national policies related to digital community education are very well developed.
	XB3	The government has increased its investment in digital community education.
	XB4	The government has increased the regulation of digital community education construction.
Performance expectations	XC1	Participating in digital community education can improve my ability to do my job.
	XC2	Participating in digital community education can improve my quality of life.
	XC3	Participating in digital community education can help me spend my leisure time and make me feel good.

	XC4	Participating in digital community education can broaden my field of knowledge.
Effort expectations	XD1	Using the digital community education platform is easy for me.
	XD2	I can easily find the content resources I need to learn.
	XD3	The depth, breadth, and difficulty of the content is appropriate and I can easily master it.
Community impact	XE1	People around me participate in digital community education I also participate.
	XE2	Recommendations from my family and friends will influence my use of the digital community education platform.
	XE3	Digital community education is good for me to get recognition from others.
Facilitation conditions	XF1	The first time I used the digital community education platform, I was able to use it unaided.
	XF2	Conducting digital community learning is easy to use and easy to operate.
	XF3	The digital community education platform is user-friendly.
	XF4	The digital community education sites are close to my home, so it is easy to go to them.
Education platform	XG1	The interface of digital community education platform is clear and beautiful.
	XG2	The interface of the digital community education platform is well-functional.
	XG3	The digital community education platform is highly interactive, and the questions raised can receive timely feedback.
	XG4	The content of the digital community education platform is updated in a timely manner.
	XG5	The digital community education platform operates stably.
	XG6	The digital community education platform can provide personalized push services.
Education resource	XH1	The digital community education platform is rich in resources and can meet my personal needs.
	XH2	The content of digital community education platform resources is novel and keeps up with the times.
	XH3	The content of the digital community education platform resources is targeted and can meet my learning requirements.
	XH4	The digital community education platform resources are interesting and can stimulate my interest in learning.
	XH5	The digital community education platform resources are practical.
	XH6	The tangible resources (tables, chairs, and computers) of digital community education are sufficient.
Team building	XI1	Digital community education has a strong faculty.
	XI2	The instructors have deep professional level knowledge.
	XI3	The instructors are well organized and grasp the key points.
	XI4	There are volunteers who serve the digital community education from time to time.
	XI5	The technical staff of digital community education are in place to serve and platform problems can be solved in time.
	XI6	The managers of digital community education are in place to serve and carry out community education activities on a regular basis.

Development of digital community education	XJ1	The education model of digital community has been well developed
	XJ2	Educational resources for digital community education are already abundant
	XJ3	Digital community education in my community is quite large.
	XJ4	I and others around me are involved in digital community education.
	XJ5	I have made great progress through digital community education.

4.2 Item Analysis of the Pre-Test Questionnaire

4.2.1 Purpose / Function

The pre-test questionnaire was selected for item analysis in order to test the adequacy of the questionnaire and to remove or modify questions that did not have high distinction and reliability.

4.2.2 Design Rule

In this study, the critical ratio method was used to find the CR value of each question in the questionnaire and to remove questions whose CR values were not within the specified range.

Item analysis was carried out by arranging the total scores of all the questions in the completed questionnaire in descending order, calculating the top 27% of the questionnaire as the high group and assigning a value of 1 to them, and the bottom 27% as the low group and assigning a value of 2 to them. t-tests were conducted for the differences between each question item in the two groups, and those questions whose test results did not reach significance were deleted. In the test scale, if the sig value is below 0.05, this item is considered to be significant and can differentiate the response level of different residents and can be retained, while those that do not meet the criteria need to be deleted [11].

4.3 Questionnaire Reliability Analysis

4.3.1 Purpose / Function

The reliability of a questionnaire refers to the stability and uniformity of the data being measured.

4.3.2 Design Rule

Questions that measure the same attributes should end up with approximately the same score, i.e., if a respondent chooses a high score for one question, they should also choose a high score for the corresponding question. If the questionnaire is not designed properly, the results will not reflect the true views of the community and may lead to bias in the study. In this study, the reliability of the questionnaire was tested using the highly accepted Cronbach's alpha value, which indicates that the higher the alpha value, the higher the reliability of the questionnaire [12]. In general, the alpha coefficient should be between 0 and 1, with an alpha coefficient of 0.8 or above indicating high reliability; between 0.5 and 0.7 indicating acceptable reliability; and when the alpha coefficient is less than 0.5, it should be discarded [14]. Using the above indicators as a reference, the reliability value in this study was set at 0.5 [12].

4.4 Exploratory Factor Analysis

4.4.1 Purpose / Function

Validity is a measure of the validity of a scale and the trait it is designed to measure. It consists of content validity and structural validity, and the level of validity can positively reflect the good or bad results of the measurement.

4.4.2 Design Rule

The design of the questionnaire was based on a large amount of literature, theories and discussions with community members. Under the guidance of the supervisor, the grammar of the questionnaire and the reasonableness and representativeness of the questions were analysed and modified. The independent variables selected can influence the dependent variables to some extent, so the questionnaire can truly reflect the situation of the factors affecting the development of digital community education.

From the structural validity of the questionnaire, SPSS was used to conduct exploratory factor analysis on the scale, and the KMO values, Bartlett's spherical test and factor loadings of the results were used to analyse the structural validity of the scale [13]. If the KMO value is above 0.6 (the closer to 1 the better), the factor loading is greater than 0.5, and the Bartlett's spherical test, the sig value is less than 0.05, then the questionnaire is suitable for factor analysis, i.e. it has good structural validity [13].

5. DATA ANALYSIS AND FINDINGS

This section presents the data analysis and results of the study. Data analysis is conducted using statistical analysis tools and the results and findings are discussed in this section. The formal implementation and analysis of the questionnaire are

also discussed, including questionnaire distribution, descriptive statistics of the sample, and reliability analysis.

The analysis of each item helps to explain the relationship hypothesis and model among the factors that influence the development of digital community education.

5.1 Item Analysis of the Pretest Questionnaire

In this study, the critical ratio method was used to find the CR value of each question in the questionnaire, and the questions whose CR values were not within the specified range were deleted. Item analysis was performed by arranging the total scores of all questions in the completed questionnaire in descending order, calculating the top 27% as the high group and assigning them a value of 1, and the bottom 27% as the low group and assigning them a value of 2. A t-test was performed for the difference between each question item in the two groups, and the items that did not reach significance were deleted. In the test scale, if the sig value is below 0.05, it is proved that this item has reached a significant level and can distinguish the level of response of different residents and can be retained, while those that do not meet the criteria need to be deleted. The researcher analyzed items on national government, residents' willingness to use, educational platform, team building, performance expectations, effort expectations, community impact, facilitation, educational resources, and the current status of digital community education. The results of the test are shown in Table 2 below.

Table 2: Results of the analysis of the items in the residents' willingness to use questionnaire

Measurement indicators	Sig. (2-tailed)	Measurement indicators	Sig. (2-tailed)
XA1	.008	XG2	.021
XA2	.000	XG3	.042
XA3	.004	XG4	.008
XA4	.004	XG5	.001
XB1	.035	XG6	.005
XB2	.001	XH1	.000
XB3	.000	XH2	.000
XB4	.004	XH3	.000
XC1	.006	XH4	.000
XC2	.022	XH5	.000
XC3	.029	XH6	.000
XC4	.006	XI1	.001
XD1	.040	XI2	.000
XD2	.032	XI3	.027
XD3	.026	XI4	.013
XE1	.017	XI5	.011
XE2	.003	XI5	.009
XE3	.004	XJ1	.046
XF1	.001	XJ2	.006
XF2	.008	XJ3	.000
ZF3	.000	XJ4	.010
XF4	.002	XJ5	.005
XG1	.034		

As can be seen from Table 3, the sig values of each survey item in the t-test are all less than 0.05, which is within the standard range of distinguishing significantly, indicating that the survey items of this questionnaire have a significant degree of distinguishing between different questionnaire fillers, and these survey items can be retained.

5.2 Questionnaire Reliability Analysis

The final scores of questions measuring the same attributes should be roughly uniform, that is, if a respondent chooses a high score for one question, he or she should also choose a high score for the corresponding question. If the questionnaire is not designed properly, the results will not reflect the true views of the community and will lead to bias in the study. In this study, Cronbach's alpha value, which has a high acceptance rate, was used to test the reliability of the questionnaire on the factors influencing the development of digital community education. a higher value of the alpha coefficient represents a higher reliability of the questionnaire. It is generally believed that the alpha coefficient should be between 0 and 1. An alpha coefficient above 0.8 proves high reliability; between 0.5 and 0.7, the reliability is acceptable; when the alpha coefficient is less than 0.5, it should be discarded [14][15][16]. Using the above indicators as a reference, the reliability value in this study is 0.5. The questionnaire was evaluated for reliability using SPSS19.0 for the objective part of the questionnaire, and the results are shown in Table 3.

Table 3: Overall reliability of the questionnaire

Cronbach's alpha	Cronbach alpha based on standardized terms	Number of items
.874	.876	45

As shown in Table 3, the overall reliability coefficient of the questionnaire on factors influencing the development of digital community education developed in this study is 0.876, which has high reliability and proves that the data results of this questionnaire are true and reliable.

5.3 Exploratory Factor Analysis

From the structural validity of the questionnaire, SPSS was used to conduct exploratory factor analysis on the scale, and the KMO value, Bartlett's spherical test, and factor loadings were used to analyze the structural validity of the scale. If the KMO value is above 0.6 (the closer to 1 the better), the factor loading is greater than 0.5, and the Bartlett spherical test, the sig value is less than 0.05, then the questionnaire is suitable for factor analysis, that is, it has good structural validity. The following are the results of the analysis of the structural validity of each indicator of the factors influencing the development of digital community education.

5.3.1 Level of residents' willingness to use

The KMO value of residents' willingness to use is 0.712, the overall explanation degree is 91.956%, and the sig value of Bartlett's sphericity test has passed the significance test. The factors were extracted in SPSS according to the criterion of eigenvalues greater than 1. Finally, one factor was extracted at the level of residents' willingness to use, and the factor loadings extracted for each measurement item ranged from 0.890 to 0.959, all of which were greater than 0.5, indicating good convergence among the measurement items and strong correlation of the common factors extracted from this variable. It is suitable for the next step of research analysis.

Table 4: Results of factor analysis at the level of residents' willingness to use

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XA1	0.959	0.712	0.000	91.956%
XA2	0.906			
XA3	0.890			
XA4	0.916			

5.3.2 National government level

From Table 5, it can be seen that the KMO value of the national government-level questionnaire is 0.723, the overall degree of explanation is 75.958%, and Bartlett's spherical test results reach the significance level. Factors were extracted in SPSS according to the criterion of eigenvalues greater than 1. One factor was extracted at the national government level and the factor loadings extracted for each measure ranged from 0.672-0.847, all of which were greater than 0.5, indicating that the common factors extracted for this variable were highly correlated. It is suitable for the next step of research analysis

Table 5: Results of country government-level factor analysis

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XB1	0.809	0.723	0.000	75.958%
XB2	0.697			
XB3	0.672			
XB4	0.847			

5.3.3 Performance expectation level

The four items XC1, XC2, XC3, and XC4 in the performance expectation dimension were selected for the principal component factor analysis. As shown in Table 6, the KMO of the performance expectation level questionnaire is 0.710, Bartlett's spherical test reaches the significance level, and the overall explanation degree is 79.588%. A total of one factor was extracted for the performance expectation dimension by the criterion of eigenvalue greater than 1 in SPSS, and the factor loadings extracted for each measure ranged from 0.760-0.954, all of which were greater than 0.5, indicating good convergence between this variable and strong co-factor correlation. It is suitable for subsequent research analysis.

Table 6: Results of performance expectation level factor analysis

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XC1	0.954	0.710	0.000	79.588%
XC2	0.896			
XC3	0.829			
XC4	0.760			

5.3.4 Effort expectation level

From Table 7, it can be seen that the KMO value of the effort expectation level questionnaire is 0.772 and the overall degree of explanation is 83.240%, Bartlett's spherical test reached the significance level and passed the test with an overall explanation of 83.240% of the corresponding variables, reflecting most of the information in the corresponding variables. Principal component analysis was conducted on the question items at the effort expectation level, and a total of one factor was extracted at the effort expectation level, and the factor loadings of each question item ranged from 0.878-0.930, which was greater than 0.5, indicating that the common factors extracted from this variable were strongly correlated, and the three question items could accurately reflect the meaning of the

corresponding variable. It is suitable for the next step of the analysis.

Table 7: Effort expectation level factor analysis results

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XD1	0.930	0.772	0.000	83.240%
XD2	0.928			
XD3	0.878			

5.3.5 Community influence levels

As can be seen in Table 8, the KMO value of the community impact level questionnaire is 0.717 and the Bartlett spherical test sig value passes the test, jointly explaining 63.917% of the corresponding variables. The principal component analysis of the survey items at the community impact level, the questionnaire extracted a factor and the factor loadings of each survey item ranged from 0.650-0.920, all above 0.5, indicating a strong correlation of the common factors extracted by this variable. It is suitable for subsequent research analysis.

Table 8: Results of Factor Analysis at the Community Impact Level

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XE1	0.920	0.717	0.000	63.917%
XE2	0.805			
XE3	0.650			

5.3.6 Convenience level

As can be seen in Table 9, the convenience level questionnaire passed the test with a KMO value of 0.790 and Bartlett's spherical test sig value of less than 0.05 reached the significance level. The overall explained 77.749% of the corresponding variables, reflecting most of the information in the corresponding variables, using principal component analysis and orthogonal rotation method in SPSS to analyze the four question items of the convenience level, and extracting factors according to the criteria of eigenvalues greater than 1. A total of one factor was extracted from the convenience level questionnaire, and the factor loadings of each survey item ranged from 0.770-0.920, all This indicates that the common factors extracted from this variable are highly correlated. It is suitable for subsequent research analysis.

Table 9: Results of Factor Analysis at the Convenience Level

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XF1	0.920	0.790	0.000	77.749%
XF2	0.905			
XF3	0.816			
XF4	0.770			

5.3.7 Education platform level

As shown in Table 10, the KMO value of the education platform level questionnaire was 0.728, and Bartlett's spherical test sig value reached the significance level, all of which passed the test and explained 65.668% of the corresponding variables overall, reflecting most of the information in the corresponding variables. The six-question items at the education platform level were analyzed using SPSS software, and factors were extracted according to the criterion of eigenvalues greater than 1. One factor was extracted from the education platform level questionnaire, and the factor loading values for each survey item ranged from 0.593-0.902, all of which were higher than 0.5, indicating a strong correlation of common factors extracted by this variable. It is suitable for the next step of the analysis.

Table 10: Results of factor analysis at the education platform level

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XG1	0.902	0.728	0.000	65.668%
XG2	0.755			
XG3	0.596			
XG4	0.593			
XG5	0.813			
XG6	0.783			

5.3.8 Level of educational resources

From Table 11, it can be seen that the KMO value of the educational resource level questionnaire is 0.844 and Bartlett's spherical test sig value reaches the significance level, all of which pass the test and overall explain 68.276% of the corresponding variables, reflecting most of the information in the corresponding variables. Using SPSS software, principal component analysis was performed on the six question items at the educational platform level and factors with eigenvalues greater than 1 were extracted, and one factor was extracted from the educational resource level questionnaire, and the factor loadings for each survey item ranged from 0.581 to 0.918, all of which were higher than 0.5, indicating a strong correlation of common factors

extracted from this variable. It is suitable for the next step of the analysis.

Table 11: Results of factor analysis at the level of educational resources

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XH1	0.918	0.844	0.000	68.276%
XH2	0.910			
XH3	0.854			
XH4	0.831			
XH5	0.818			
XH6	0.581			

5.3.9 Team building level

As seen in Table 12, the KMO value of the team building level questionnaire was 0.749, and Bartlett's spherical test sig value reached the significance level, all of which passed the test and overall explained 82.137% of the corresponding variables, reflecting most of the information in the corresponding variables. Using SPSS software, principal component analysis was performed on the six question items at the education platform level and factors with eigenvalues greater than 1 were extracted, and one factor was extracted from the evaluation system level questionnaire, and the factor loadings for each survey item ranged from 0.719-0.911, all of which were higher than 0.5, indicating a strong correlation of common factors extracted from this variable. It is suitable for the next step of the analysis.

Table 12: Results of team building level factor analysis

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XI1	0.911	0.749	0.000	82.137%
XI2	0.906			
XI3	0.801			
XI4	0.845			
XI5	0.719			
XI6	0.882			

5.3.10 Current status of digital community education development

As can be seen from Table 13, the KMO value of the questionnaire on the current state of digital community education development dimension is 0.716, and the Bartlett spherical test sig value reaches the significance level, all of which pass the test, explaining 72.706% of the corresponding variables overall, reflecting most of the information in the corresponding variables. Using SPSS software, principal component analysis was conducted on the five-question items of the digital community education development status quo level, and a factor with an eigenvalue greater than 1 was extracted from the digital community education development status quo level questionnaire, and the factor loading values of each survey item were located between 0.666-0.923, all of which were higher than 0.5, indicating the strong correlation of common factors extracted from this variable. It is suitable for the next step of the analysis.

Table 13: Results of Factor Analysis of Current Dimensions of Digital Community Education Development

Clearly defined objectives	Factor loading amount	KMO value	Significance	Overall explanation degree
XJ1	0.923	0.716	0.000	72.706%
XJ2	0.766			
XJ3	0.725			
XJ4	0.700			
XJ5	0.666			

5.4 Questionnaire distribution

A simple random sampling was used to obtain sample data from community residents in each district of Jinan where community education is available, such as Shizhong, Lixia and Huaiyin. The questionnaires were administered in two ways, one was a paper questionnaire distributed on-site and the other was an electronic questionnaire distributed using the Questionnaire Star platform. As in the pre-test, the researcher asked the community residents whether they had participated in digital community education and selected those who had participated to distribute the questionnaires and collected them on-site. The data were screened during data entry, and those questionnaires with the same answer for all questions or with many missing answers were considered invalid. A total of 250 questionnaires were distributed and 236 questionnaires were returned, of which 229 were valid, with an efficiency rate of 91.6%.

This study was intended to investigate the perceptions of the overall population of all age groups and classes on the development of digital community education, so the researcher intentionally controlled for a relatively even distribution of age and gender when distributing the questionnaires, and the results are shown in Table 14. Of the 229 valid responses, 112 (48.9%) were males and 117 (51.1%) were females. The age distribution of the respondents was 21.4% for those

under 18, 27.5% for those between 18 and 30, 26.2% for those between 30 and 55, and 24.9% for those over 55.

Table 14: Descriptive statistics of the sample

Basic Feature	Classification	Frequency	Percentage
Gender	Male	112	48.9%
	Female	117	51.1%
Age	Under 18	49	21.4%
	18-30	63	27.5%
	30-55	60	26.2%
	55 or above	57	24.9%

5.5 Reliability Analysis of the Sample

Before analyzing the data, in order to ensure the scientific validity of the data, the sample data need to be tested for reliability again. As can be seen in Table 15, the reliability of all variables reached above 0.7, and the reliability of the overall sample reached 0.878, indicating that the questionnaire has good internal consistency. The KMO value of the sample in Table 16 is 0.812, which is greater than 0.5, and the sig is 0.000, which indicates that the questionnaire has good validity and is suitable for the subsequent analysis.

Table 15: Reliability analysis of the sample

Variables	Title item	Cronbach's alpha value	Cronbach's alpha value of the overall sample
Residents' willingness to use	2	0.905	0.878
National government	5	0.739	
Performance expectations	4	0.726	
Effort Expectation	3	0.885	
Community impact	3	0.753	
Facilitation conditions	3	0.875	
Education platform	5	0.713	
Education resource	6	0.903	
Evaluation System	3	0.886	
Team building	6	0.802	

Table 16: Validity analysis of the sample

The Kaiser-Meyer-Olkin metric of sampling adequacy.	.812
Bartlett's test for sphericity Approximate chi-square	1862.847
df	302
Sig.	.000

6. DISCUSSION

This study investigates the influencing factors of digital community education through interviews and questionnaires. A model of the influencing factors is established, and hypotheses about the relationships among the factors are made and validated using a structural equation model. The results provide a scientific basis for the proposed development strategy of digital community education, and recommendations are proposed for residents, platform resources, and the national government to explore new paths for the development of digital community education. This study contributes to the understanding of digital community education development and provides practical implications for its improvement.

7. CONCLUSION

The research on community education mainly focuses on models, systems, resources, policies, and the current situation, with limited studies on the influencing factors of community education development and virtually no studies on digital community education development. The study surveyed residents of Jinan city on digital community education, but the sample size may not be representative enough for national studies. Future studies should expand the sample to improve the model's accuracy and persuasiveness. The study proposed nine influencing factors but acknowledged that they are not comprehensive enough as they did not consider factors such as literacy level and age. Future studies should strive to summarize and refine influencing factors in a more comprehensive way.

REFERENCES:

[1] S. D. Harahap, J. Jimmi, P. J. Pattiasina, Z. Trinova, and A. Damayanto, "Trends in Technological Innovation in Education During a Time of Pandemic Disruption: Examining The Perspective of Teaching Digital Pedagogy," *Nazhruna: Jurnal Pendidikan Islam*, vol. 5, no. 1, pp. 37-50, 2022.

[2] E. Midwinter, Education and the Community. Routledge, 2017.

[3] J. Ye and S. Liu, "A preliminary exploration of the market-oriented operation mode of digital learning communities and the basic idea of 'Aopeng Learning Center'," *Modern Distance Education*, 2017.

[4] Z. Wang and X. Ju, "An empirical study on the factors influencing the participation of older people in community education," *China Distance Education*, vol. 20, no. 5, pp. 50-56, 2020.

[5] C. She, "The role of multimedia technology in the construction of digital community education resources," 2022.

[6] J. Huang, "An empirical study on the factors influencing bloggers' blogging behavior in China," *Modern Educational Technology*, vol. 18, no. 2, pp. 125-129, 2019.

[7] X. Wang, "Exploring the influencing factors and ways to carry out community education in rural areas," *Jiangsu Science and Technology Information*, vol. 25, no. 28, pp. 22-23, 2019.

[8] H. Guo, "Analysis of the influencing factors of community education in China," *Journal of Economic Research*, vol. 20, no. 28, pp. 254-255, 2018.

[9] J. Ye and S. Liu, "A preliminary exploration of the market-oriented operation mode of digital learning communities and the basic idea of 'Aopeng Learning Center'," *Modern Distance Education*, 2017.

[10] Z. Wang and X. Ju, "An empirical study on the factors influencing the participation of older people in community education," *China Distance Education*, vol. 20, no. 5, pp. 50-56, 2020.

[11] T. A. Sylev, "The investigation of the validity of a single k-value for fly ash in the range of w/c ratio critical for the standards," *Construction and Building Materials*, vol. 245, pp. 118284, 2020.

[12] M. Polat, C. Toraman, and Nihan Slpük Turhan, "Reliability Analysis of PISA 2018 Reading Literacy Student Questionnaire Based on Item Response Theory (IRT): Turkey Sample," 2022.

[13] S. Chansaengsee, "Time management for work-life and study-life balance," *Humanities and Social Sciences*, vol. 10, pp. 20-34, 2017.

[14] K. S. Taber, "The Use of Cronbach's Alpha When Developing and Reporting Research Instruments in Science Education," *Research in Science Education*, vol. 48, no. 6, pp. 1273-1296, 2018.

[15] J. M. Cortina, "What is coefficient alpha? An examination of theory and applications," *Journal of Applied Psychology*, vol. 78, no. 1, pp. 98-104, 1993.

[16] L. J. Cronbach, "Coefficient alpha and the internal structure of tests," *Psychometrika*, vol. 16, no. 3, pp. 297-334, 1951, doi: 10.1007/bf02310555.

[17] L. Zhang and R. Huang, "The design of mobile learning environment in the context of connectionism," *Modern Educational Technology*, vol. 17, no. 2, pp. 115-119, 2018.

[18] Q. Shi, X.Wang, and Y. Pan, "Community education in China: Current situation and prospects", *Contemporary Education Research*, vol. 3, pp. 26-32, 2019.

[19] X. Wang, Q. Shi, and X. Li, "A study of Chinese university students' learning behaviours in MOOCs", *International Journal of Emerging Technologies in Learning*, vol. 16, no. 6, pp. 1-14, 2021.

[20] H. Jiang, L. Jiang and R. Yu, "The construction of an online interactive teaching model during the school postponed of COVID-19 pandemic", *Chin Audiovis Edu*, vol. 4, pp. 40-41, 2020.

[21] R. Huang, G. Chen, J. Zhang, P. Chen and S. Li., Five laws on technology promoting learning, *Open Edu Res*, vol. 16, no. 1, pp. 11-19, 2010.

[22] T. Zhang and B. Yuan, Visualizing MOOC User Behaviors: A Case Study on XuetangX. In: *et al.* Intelligent Data Engineering and Automated Learning – IDEAL 2016. IDEAL 2016, *Lecture Notes in Computer Science*, vol 9937, 2016. https://doi.org/10.1007/978-3-319-46257-8_10.