Factors Affecting Participation in Lifelong Learning of Elderly in China: The Case of Beibei District Chongqing Municipality

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Abstract

China's aging population poses a growing challenge, and the participation of elderly in lifelong learning is becoming increasingly important. This study aimed to study the international good practices of lifelong learning for elderly and investigate the factors affecting participation in lifelong learning for the elderly in Beibei District. This study employed a mixed-methods approach, developing practices and models of lifelong learning for the elderly from various countries through documentary research and surveying 400 elderly aged 60 and above from Beibei District. The study results indicated that learning engagement among elderly was closely related to access to diverse learning resources, a positive learning attitude and basic digital literacy, with learning resources being the factor of strongest influence. However, difficulties using modern devices and online platforms can hindered participation. In conclusion, diverse and accessible learning opportunities when combined with a supportive learning environment, can help enhance lifelong learning participation among elderly, consistent with international good practices.

Keywords: Lifelong learning, Elderly, China

1. Introduction

Population aging is reshaping global society. It is projected that by 2050, the number of people aged 60 and over will reach 2.1 billion, accounting for approximately 22% of the global population (United Nations Department of Economic and Social Affairs [UN DESA], 2021). China is one of the fastest-aging countries, with people aged 60 and above accounting for 18.9% of the total population, a figure projected to exceed 30% by 2035 (Ministry of Education of the People's Republic of China, 2021). While challenges posed by an aging population include increased healthcare and pension costs and a shrinking labor force, it also presents opportunities, such as the "silver economy," which encompasses re-employment pathways, improved healthcare, age-friendly environments, and the promotion of lifelong learning (Eatock, 2015; Organisation for Economic Co-operation and Development [OECD], 2020). Within the framework of active aging, health, participation, and safety constitute the pillars of well-being (World Health Organization [WHO], 2002). Lifelong learning aligns with this concept, building capabilities,

maintaining cognitive function, enhancing social connections, and fostering inclusion in a rapidly digitalizing society (UNESCO Institute for Lifelong Learning [UIL], 2015).
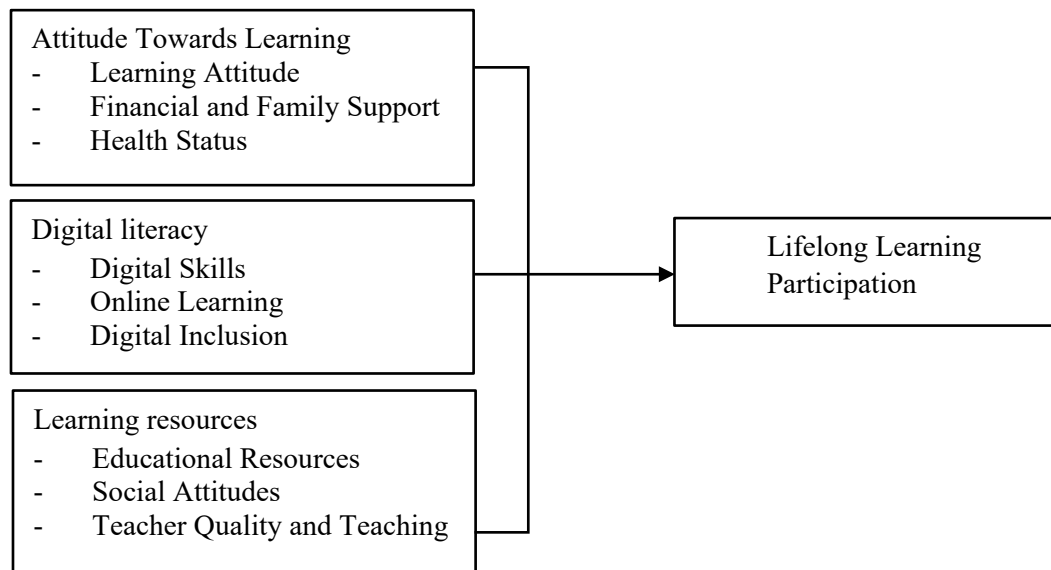
Despite China's emphasis on the development of University of the Third Age (U3A) and "Internet + Senior Education," significant barriers remain. Many elderly face sensory and mobility limitations, which undermine their confidence and even limit their participation in learning (WHO, 2024). Digital barriers are also a common problem, with difficulties using mobile devices, low platform literacy, and anxiety about online transactions often hindering participation in online learning (Mubarak & Suomi, 2022). Uneven urban-rural resource distribution, insufficient elderly education teachers, and limited community support further limit elderly access to education (China Association of Elderly Education, 2021). The aging population exacerbates these issues, with the number of "empty nesters" rising, potentially exceeding 200 million by 2030. This increases the likelihood of isolation among elderly and highlights the need for lifelong learning (He et al., 2020; Chen, 2012).

Chongqing is one of China's most aging cities. This study focuses on Beibei District, a district in Chongqing. With its dense urban communities and marginal rural and urban-rural fringe, the district epitomizes China's geographic and resource diversity. Beibei has 177,300 residents aged 60 and over, representing 21.23% of its total population of 834,900, exceeding the national average (Chongqing Municipal People's Government, 2022). Beibei District prioritizes the learning needs of elderly, with initiatives such as skills training and digital experience activities for elderly demonstrating a strong commitment to promoting lifelong learning (Sohu News, 2024).

Research on aging and education has developed, but most of research focuses on formal education or younger groups, resulting in a lack of learning opportunities for elderly. In China, although the policy framework has expanded, promoting the participation of elderly in learning in specific implementation is affected by different factors, such as learning resources, digital literacy, and attitude towards learning. To bridge the gap between these factors, the designed interventions need to consider local conditions. This is where the importance of drawing on good practices in lifelong learning for elderly in various countries becomes prominent. This study combines documentary research of global good practices with a survey of people over 60 years old to provide practical evidence for policymakers, educators, U3As, and senior learning centers.

The dependent variable in this study is the lifelong learning participation. As with the analysis of the independent variable above, elderly participation in lifelong learning cannot be separated from the influence of the independent variables of attitude towards learning, digital literacy and learning resources.

The following diagram shows the conceptual framework of this study:

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┌─────────────────────────────────┐
│ Attitude Towards Learning       │
│ -   Learning Attitude           │
│ -   Financial and Family Support│
│ -   Health Status               │─┐
└─────────────────────────────────┘ │
┌─────────────────────────────────┐ │    ┌──────────────────────┐
│ Digital literacy                │ │    │ Lifelong Learning    │
│ -   Digital Skills              │ ├──→ │ Participation        │
│ -   Online Learning             │ │    └──────────────────────┘
│ -   Digital Inclusion           │─┤
└─────────────────────────────────┘ │
┌─────────────────────────────────┐ │
│ Learning resources              │ │
│ -   Educational Resources       │ │
│ -   Social Attitudes            │ │
│ -   Teacher Quality and Teaching│─┘
└─────────────────────────────────┘
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Figure 1: Conceptual Framework

2. Research Objectives

2.1 To study the international good practices of lifelong learning for elderly.
2.2 To investigate the factors affecting participation in lifelong learning of elderly in Beibei district, Chongqing municipality.

3. Research Questions

3.1 What are the international good practices of lifelong learning for the elderly?
3.2 What key factors influence the participation of elderly individuals in lifelong learning in Beibei district, Chongqing municipality?

4. Literature Review

4.1 Lifelong Learning for the Elderly

Lifelong learning refers to "all learning activities undertaken throughout life that aim to enhance knowledge, skills, and abilities for personal, civic, social, and employment purposes" (UIL, 2015). It encompasses formal, informal, and non-formal education (UIL, 2023). Formal learning is primarily structured and degree-oriented (Ainsworth & Eaton, 2010); for elderly, formal education offers them the opportunity to pursue a degree. Non-formal education, rather than degree-oriented, is structured and purposeful, prioritizing elderly interests, health, and social engagement (Eshach, 2007). Informal education is integrated into daily activities such as reading, hobbies, intergenerational exchange, community interaction, and travel, and increasingly, learning is conducted through smart devices (Maarschalk, 1988).

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Lifelong learning spans the entire human lifecycle and holds special significance for elderly, supporting their ability to "learning to learn" in a rapidly changing environment (Bhatia, 2015). Research has shown that engaging in lifelong learning can reduce loneliness, expand social networks, and foster a sense of purpose (Adamczyk & Budny, 2016). Engaging in cognitive activities such as reading, gaming, and music can help mitigate decline (Wilson et al., 2012); for example, music learning can alleviate age-related deficits in speech perception and attention (Tierney et al., 2023). Furthermore, to adapt to the digital age, many digital skills courses are being offered for elderly. These courses allow them to learn how to use smart devices to increase their autonomy in daily life, such as through online payments, telemedicine, and e-services. These benefits are particularly important given the increasing prevalence of the "empty nest" phenomenon and the increasing risk of isolation.

4.2 Lifelong Learning for the Elderly in China

With the accelerated aging of China's population, a thriving lifelong learning system is emerging, with U3As, community learning centers, museums, libraries, and online platforms serving many older learners (CAEE, 2021). Education coverage between urban and rural areas is increasing with the expansion of distance education and online learning platforms (State Council of the People's Republic of China, 2021). However, regional disparities persist. Furthermore, community education is relatively new and faces uneven resource endowments and capabilities (Zhu & Zhou, 2023).

The Law of the People's Republic of China on the protection of the rights and interests of the elderly (1996) first recognized the right of seniors to education in China and stipulated that the government should support it. While China's elderly population started relatively late, laws and policies have gradually incorporated senior education into its framework, with further initiatives proposed to promote lifelong learning. Subsequent plans have integrated senior education into the broader agenda of a learning society, setting goals for senior universities and community learning centers, and promoting "Internet + Senior Education" (General Office of the State Council, 2016; State Council of the People's Republic of China, 2021). To address the intensification of the aging population, strategies related to the "silver economy" have further emphasized human capital development, digital inclusion, and the integration of education, culture, and social services (State Council of the People's Republic of China, 2024).

China has made unremitting efforts to promote lifelong learning, but many challenges remain, such as the uneven supply of resources between urban and rural areas, limited resources for senior education teachers, and barriers related to health, mobility, and technology (Wang et al., 2016). Addressing these issues requires tailoring service content to the needs of elderly, diversifying service formats, and strengthening community support and outreach.

4.3 Factors Influencing Participation in Later life Learning

To enhance the well-being of the elderly and the healthy development of society, many countries are advocating the promotion of lifelong learning for the elderly but face many obstacles. The most common obstacles are imperfect lifelong learning policies for the elderly, insufficient financial support and insufficient learning opportunities (UN

DESA, 2020). In addition, from the perspective of the elderly themselves, they face physical health limitations, economic barriers and social prejudices. These are obstacles that hinder the elderly from participating in lifelong learning. This section mainly discusses three major factors that affect the participation of the elderly in lifelong learning: "Attitude Towards Learning," "Digital Literacy," and "learning resources."

4.3.1 Attitudes Toward Learning

Students' attitudes towards learning lead them to engage in learning activities. Positive attitudes towards learning are very important in learning and lead people to engage in lifelong learning (Kara, 2009, p. 100). Paul (2017) found that active learning leads to more enjoyment, less boredom, enhanced thinking and critical skills. Positive attitudes towards learning promote active learning, as does elderly's engagement in lifelong learning. However, elderly's attitudes to learning are influenced by many factors and not all elderly have positive attitudes to lifelong learning. Conversely, health issues can directly impact elderly lifelong learning and undermine their confidence in learning. Globally, many elderly suffer from health issues, with approximately 16% experiencing hearing impairment and 12% experiencing visual impairment (WHO, 2024). While health conditions inevitably affect elderly learning participation, they should not be an absolute barrier to learning.

Elderly attitudes toward learning are influenced by financial and family support. Most elderly who participate in lifelong learning typically live stress-free lives and have pensions, stable living security, and a stable income. The financial pressure to participate in lifelong learning is relatively low, and elderly are more likely to participate (Narushima et al., 2018). For those who do not participate in lifelong learning, part of the reason is financial constraints, especially in rural areas, where elderly prefer to earn money through farming rather than spending it on education. Furthermore, due to the Chinese concept of family responsibility, elderly often take on the responsibility of caring for their grandchildren. In a study by Li, Li, and Wan (2021), it was found that intergenerational rearing is intense and very testing for the physical fitness of the carers. The physical aspect of the elderly tends to be more susceptible to disruptions of disease and pain, and the elderly have to sacrifice their time to participate in social activities and even normal rest, much less to engage in lifelong learning.

4.3.2 Digital Literacy

In recent years, China has continuously explored digital literacy to promote lifelong learning among elderly. Research by Li, Gao, and Xue (2022) indicates that insufficient technological literacy limits the digital dividend for elderly, with disparities between urban and rural areas. Elderly with higher technological literacy are more likely to master digital cultural products, increasing their enthusiasm and engagement. Many U3As and senior learning centers now offer online courses to facilitate access for elderly. However, many lack basic digital skills training and struggle to adapt to the required operations, or even be unable to attend classes (Shi et al., 2023).

Park (2024) noted in her research that while digital device usage among elderly is relatively high at 95.1%, due to limited purchasing power and a lack of awareness of the necessity of technological devices, elderly digital proficiency is only 54.5%,

significantly lower than other disadvantaged groups. Furthermore, the interface design of online learning platforms makes it difficult for elderly to adapt and use them (Shi et al., 2023). Many learning platforms fail to address the specific needs of elderly, such as using larger fonts, simplified interfaces, and simpler operations. Many elderly have visual and hearing impairments, but learning platforms lack voice guidance and automated assistance, which can increase their resistance to new experiences.

Iancu and Iancu (2020) analyzed how poorly designed online platforms for elderly can lead to poor learning experiences. Online learning platforms with complex designs and unclear functional layouts can discourage elderly from learning, leading them to believe they cannot master the content and give up. This is especially true when they cannot find the functions they need or make operational errors, further undermining their confidence and causing them to resist online learning and be unable to acquire knowledge and skills through online platforms.

4.3.3 Learning Resources

The availability of learning resources directly impacts lifelong learning for elderly. First, there is an inequality in educational resources between elderly and young people. Because educational resources tend to be allocated to younger people, elderly education is neglected. Coupled with negative social stereotypes such as the elderly's poor learning ability, age discrimination, and a low return on educational investment, the lifelong learning needs of elderly are often overlooked (Findsen & Formosa, 2011). Second, there are regional disparities in elderly education resources. These resources are often concentrated in economically developed cities, making these opportunities difficult for seniors in rural areas (Formosa, 2012, p. 287). In some areas, transportation difficulties make it difficult for rural elderly to travel to urban areas to participate in educational activities. Finally, the lack of professional teachers in elderly education is a major obstacle. Existing teachers lack professional training in teaching elderly courses, especially in age-appropriate instructional design (Zhang et al., 2022).

5. Research Methodology

5.1 Research Design

This study employed a mixed-methods approach. To address research objective 2.1, a thematic analysis approach was employed, following the "3Cs" model (codes, categories, and concepts) proposed by Lichtman (2013, p. 252). To address research objective 2.2, a multi-stage sampling survey was conducted in Beibei District, Chongqing, to explore the factors influencing lifelong learning participation among elderly in this district.

5.2 Qualitative Approach (Research Objective 2.1)

5.2.1 Document Sources and Selection Criteria

To ensure the quality and relevance of documentary research, the following aspects were followed in the literature screening:
The literature must be directly related to the promotion, implementation or evaluation of lifelong learning policies or practices for elderly.

Only documents published by reputable institutions are included. Examples include government policy documents and legislation, reports from international organizations such as UNESCO, the OECD, and the European Commission, journal articles and academic books, as well as official websites of lifelong learning programs.

To maintain contemporary relevance, this study focused mainly on literature published in the past 10 years (2015 and beyond). However, foundational literature with historical significance was also considered if it is still influential in the current policy framework.

5.2.2 Thematic Analysis

To analyze the selected literature, a thematic analysis approach was employed, following the "3Cs" model (codes, categories, and concepts) proposed by Lichtman (2013, p. 252).

5.3 Quantitative Approach (Research Objective 2.2)

5.3.1 Population and Sampling

The target population of this study is elderly aged 60 and above in Beibei District, Chongqing. Based on multi-stage sampling, the researcher selected two streets and two townships, and two communities were each sampled separately, for a total of eight communities. The total number of people over 60 years of age in Beibei district was 173,300 and the sample size is 400 according to Yamane's formula, so 50 participants were randomly selected from each community.

5.3.2 Research Instruments

Using a structured questionnaire to collect data and a closed-ended questionnaire design. The questionnaire for this study consisted of five parts, Parts 2 through 5 used a 5-point Likert scale:

Part 1 investigated the respondents' general information: gender, age, place of residence, retirement status, financial resources, and tendency in using smart device.

Part 2 examined the influence of "Attitude Towards Learning," on the participation of elderly in lifelong learning.

Part 3 examined the impact of "Digital Literacy" on the participation of the elderly in lifelong learning.

Part 4 examined the impact of "Learning Resources" on the elderly participation in lifelong learning.

Part 5 directly investigated the participation of the elderly in lifelong education in Beibei District.

5.3.3 Quality of Research Instruments

The questionnaire was tested for validity by having three experts assess the relevance of each item to the research objectives using the item-objective congruence (IOC) technique. Only items with scores between 0.66 and 1.00 were retained. Reliability of the questionnaire was assessed using the Cronbach's α coefficient (1970), which was greater

than 0.9 in a pilot study of 40 elderly people in Beibei District before formal data collection. This indicates that the questionnaire has good reliability and validity, and the research instrument is of high quality. Table 1 shows the reliability and validity of each variable.

Table 1: Validity (IOC) and Reliability (Cronbach's α) of Each Variable

Variables	IOC	Cronbach's α
Attitude Towards Learning	1.00	0.905
Digital Literacy	0.66-1.00	0.932
Learning Resources	0.66-1.00	0.925
Participation in Lifelong Learning	0.66-1.00	0.955

5.3.4 Data Collection

The questionnaire was distributed both online and offline. The online questionnaire platform was "Wenjuanxing," while the offline questionnaire was a paper-based one. Because the research subjects were elderly, some of whom may have had reading and comprehension difficulties, the researcher provided guidance to help them complete the questionnaire.

First, the researcher requested formal approval from the Faculty of Social Sciences and Humanities at Mahidol University to collect data. Second, they sought permission from community leaders and U3A administrators in Beibei District to conduct the survey in their respective institutions, including U3As, community learning centers, and selected public venues. Third, after obtaining approval, the researcher coordinated with local community workers and learning center staff to assist in distributing the questionnaire. Helping identifies appropriate participants and ensure the smooth conduct of the survey. Finally, participants were given a Form of Informed and Voluntary Consent or Participate in Research and a Participant Information Sheet to complete, with in-person assistance provided as needed to ensure clarity.

5.3.5 Statistic and Data Analysis

After data collection was completed, invalid questionnaires were eliminated before data analysis using standard statistical analysis software, including descriptive statistics, bivariate correlations and multiple linear regression analysis. Descriptive statistics were used to summarize the demographic characteristics of the respondents (e.g. age, gender, retirement status, and tendency in using smart device), as well as the responses to the Likert scale items on attitudes towards learning, digital literacy, learning resources, and participation in lifelong learning. Pearson correlation coefficients were calculated to examine the associations between the sub-variables of the three independent variables and lifelong learning participation. Multiple linear regression analysis (Enter method) was used to predict which factors influence lifelong learning participation among elderly most. This examined the strength and direction of these relationships by assessing the impact of attitude towards learning, digital literacy and learning resources on elderly's participation in lifelong learning activities to gain insight into the main drivers of participation.

5.3.6 Research Ethics

Before completing the questionnaire, all participants were informed of the research purpose and objectives and presented an IRB certificate issued by Mahidol University's Committee of Research Ethics, with the certificate of approval number 2025/055.0506. Furthermore, researcher assured participants that their participation was entirely voluntary and that they had the right to withdraw at any time without any consequences. The questionnaire was completed anonymously and did not contain any personally identifiable information (name, home address, ID number, etc.). All information was used solely for academic research and would not be disclosed to any third party.

6. Results

6.1 Qualitative Results: International Good Practices of Lifelong Learning for Elderly

To analyze good practices in lifelong learning for elderly, thematic analysis employed the "3Cs" data analysis framework proposed by Lichtman (2013, p. 252): codes, categories, and concepts. Forty-eight articles were coded into themes reflecting different aspects of lifelong learning practices among elderly. These themes were then organized into categories aligned with the study's conceptual framework: Attitude Towards Learning, Digital Literacy and Learning Resources, each of which contained sub-variables. Ultimately, seven concepts emerged, as follows:

Concept 1: Diversity in access to educational resources

Taiwan introduced the Healthy Aging and Intergenerational Learning (HAIL) model in 2012 and has achieved remarkable results. Students study alongside elderly in courses related to social aging. In Spain, the concept of "digital identity" has expanded the meaning of educational resources in the digital age. Structured elderly education institutions provide digital skills, online engagement, and identity building, helping older learners more fully integrate into a highly connected society (Muñoz-Rodríguez et al., 2020). Institutional education is one of the main channels for elderly in North America to access educational resources. With funding from state governments, community colleges collaborate with elderly centers; universities establish retirement learning centers to offer regular courses, workshops, and cultural activities for elderly. Furthermore, the Senior Center Humanities Project, funded by the National Endowment for the Humanities (NEH), provides local elderly centers with rich humanities learning opportunities.

Concept 2: Encourage positive learning attitudes and motivation in later life

Joseph and Human (2020) demonstrated that older participants in a music ensemble program described the experience as "*a pillar of their lives*," making them feel "s*afe and accepted*" (p. 12). As one participant emphasized, "*We relied on each other's voices*" (p. 14). Laes (2015) conducted a case study of a Finnish older women's rock band whose members primarily defined themselves as learners rather than performers. One participant even described the band as her "savior" who helped her overcome loneliness

and depression (p. 10). Mora, Quito, and Sarmiento (2017) studied how elderly in Ecuador strongly preferred active, visual, and sequential learning styles, emphasizing teamwork and practical application. "*Older adults were more likely to favor perceptual, active, visual, and sequential learning styles because they were more inclined to apply facts rather than theory*" (p. 5).

Concept 3: Integrate health and well-being into lifelong learning programs

Lifelong learning centered on health is key to successful aging. In the United States, many curricula integrate nutrition, preventive care, and wellness strategies. This systematically institutionalizes health education and integrates it into a lifelong learning environment. Tam et, al. (2016) conducted a comparative study in Hong Kong and Australia. The results showed that despite differences in societal values, Hong Kong emphasizes family-centered care while Australia emphasizes a more individual-centered lifestyle, educational participation consistently improved elderly mental health and life satisfaction. In Singapore, elderly who participated in singing, dancing, and fitness classes experienced statistically significant improvements in mental health, life satisfaction, and quality of life (Fang & Sim, 2024).

Concept 4: Promote digital literacy and bridge the digital divide

Turkalj, Kelić, and Štimac (2020) emphasize that the European Union explicitly lists digital and technology skills as foundational skills for adult and older learners. To support implementation, numerous online platforms have been launched, such as the European Electronic Platform for Adult Learning (EPALE), which centralizes educational resources, peer networks, and course databases accessible to older adults and training institutions. Lifelong learning institutions in the United States have experimented with technology-based instruction (TBI), and many older learners have expressed confidence in using computers, tablets, and smartphones and are willing to participate in blended or online courses (Hansen et al., 2019). Elderly participate in digital skills courses not only to learn new tools but also to reduce dependence on family members, maintain social connections, and build confidence in handling daily tasks. Learning environments that allow for mistakes and provide peer encouragement can alleviate technology anxiety among elderly (Pihlainen et al., 2023).

Concept 5: Foster intergenerational and community learning to foster social inclusion

In Australia, community homes operated by local nonprofit organizations serve as a model for community learning within the Adult and Community Education (ACE) field. They provide small-class formal and informal learning opportunities for older adults at low cost. Learning in these community homes is often life-centered and interactive, fostering trust and a sense of belonging, with a particular emphasis on engaging individuals from socioeconomically marginalized groups and those with disabilities (Ollis et al., 2018). Eaton and Salari (2005) studied senior centers in the United States that integrated education with social interaction and volunteering. Combining instruction with volunteering opportunities and empowerment mechanisms was found to be more effective in maintaining engagement than programs that use multi-purpose classrooms and introduce

disruptions. In the Czech Republic, a program connecting preschoolers with older learners has been shown to enhance children's understanding of aging while giving elderly meaningful roles and recognition (Tallová, 2020).

Concept 6: Strengthening policy, financial and family support mechanisms to enhance elderly participation

In Malta, the government supports U3A by subsidizing rent and teacher fees and coordinating the operation of community day centers, legitimizing learning for elderly and reducing the financial burden on older learners (Formosa, 2012, p. 189). Dhirathiti (2019) describes the "*the collaborative role of various actors，local governments, private and non-governmental entities, local communities, and elderly themselves in the provision and delivery of lifelong learning services is crucial for sustainability*" (p. 216). Ashaari et al. (2023) highlight that in Malaysia, family encouragement, often through communication technology, helps older learners overcome loneliness and maintain their learning motivation (p. 210).

Concept 7: Flexible curriculum and pedagogical adaptation

In the United States, "*designing courses that align with older learners' interests can increase participation and persistence in lifelong learning programs*" (Talmage et al., 2015, p. 237). Le and Billett (2022) observed that senior learning centers offer not only reemployment skills but also courses related to culture, the arts, and health (p. 15). Singapore's National School for the Aged (NSA) further institutionalizes flexible lifelong learning opportunities. NSA courses are designed to be exam-free, heavily subsidized, and easily accessible, and older learners have described them as "game-changing." The NSA also prioritizes interactive teaching methods and an inclusive learning environment (Maulod & Lu, 2020, p. 7).

6.2 Quantitative Research: Factors Affecting Participation in Lifelong Learning of Elderly in Beibei District

A total of 400 questionnaires were collected in Beibei District. Following the sample design outlined in the research methodology, 200 respondents were drawn from subdistricts and 200 from townships, each representing 50% of the total study population. Many respondents were aged 60-64 (47.8%), followed by 65-69 (22.5%) and 70-74 (18.3%). Women comprised the largest proportion of participants (61.3%), with 245 women participating. Regarding the respondents' retirement status, the majority (80.3%) were retired, while 19.8% were still employed. Table 1 shows the descriptive statistics of the sub-variables of Attitude Towards Learning, Digital Literacy and Learning Resources.

Table 2: Descriptive Statistics of the Sub-variables of Attitude Towards Learning, Digital Literacy and Learning Resources

Independent Variable	Sub-variable	Mean	SD	Level
Attitude Towards Learning	Learning Attitude	3.71	1.03	High
	Financial and Family Factors	3.52	1.04	High
	Health Status	3.42	1.06	High
Digital Literacy	Digital Skills	3.34	1.19	Moderate
	Online Learning	3.07	1.24	Moderate
	Digital Inclusion	3.71	1.02	High
Learning Resources	Educational Resources	3.01	1.18	Moderate
	Social Attitudes	3.48	1.00	High
	Teacher Quality and Teaching	3.27	1.17	Moderate

Note: 1.00-1.80 = lowest level, 1.81-2.60 = low level, 2.61-3.40 = moderate level, 3.41-4.20 = high level, 4.21-5.00 = highest level

As shown in Table 2, among all sub-variables, *Learning Attitude* and *Digital Inclusion* had the highest mean values, both at 3.71. The three sub-variables of *Attitude Towards Learning* are at high levels. *Learning Attitude* has the one of the highest mean scores of all sub-variables (M=3.71, SD=1.03). *Financial and Family Factors* (M=3.52, SD=1.04) and *Health Status* (M=3.42, SD=1.06) are also high. This indicates that most elderly have a positive attitude toward lifelong learning. Their financial and family conditions allow them to participate, and their health status does not pose a significant obstacle to their participation. Results for the three sub-variables of *Digital Literacy* show that both *Digital Skills* (M = 3.34, SD = 1.19) and *Online Learning* (M = 3.07, SD = 1.24) are at moderate levels, indicating that elderly generally perceive themselves as average in their ability to apply digital skills and participate in online learning. In contrast, the *Digital Inclusion* (M = 3.71, SD = 1.02) is rated high, indicating that elderly face fewer barriers to accessing digital learning environments and opportunities. These results suggest that elderly still have room to make progress in digital skills and online learning. Effectively utilizing digital learning resources opens greater possibilities for participation in lifelong learning. Among the three sub-variables of *Learning Resources*, *Social Attitudes* (M=3.48, SD=1.00) reached a high level, indicating that Beibei District encourages the elderly to participate in lifelong learning. Meanwhile, *Educational Resources* (M=3.01, SD=1.18) and *Teacher Quality and Teaching* (M=3.27, SD=1.17) were at moderate levels, indicating that there is room for improvement in the richness of curriculum resources and the professional competence of teachers.

Multiple regression analysis was used to examine the combined impact of attitude towards learning, digital literacy and learning resources on lifelong learning participation. The results are summarized in Table 3.

Table 3: Regression Analysis of Factors Affecting Lifelong Learning Participation

Variable	B	β	t	p
Attitude Towards Learning	.300	.283	4.711	<.001
Digital Literacy	.266	.273	4.013	<.001
Learning Resources	.343	.345	7.172	<.001

Model Summary: R^2 = .722, Adjusted R^2 = .719
ANOVA: F (3, 396) = 342.045, p < .001

$$Z_{\text{participation}} = .283\, Z_{\text{Attitude Towards Learning}} + .273\, Z_{\text{Digital Literacy}} + .345\, Z_{\text{Learning Resources}}$$

Table 3 shows that the model is highly significant (R^2 = .722, adjusted R^2 = .719; F = 342.045, p < .001). Among the predictors, *Learning Resources* were the strongest factor (β = .345, p < .001), indicating that sufficient learning materials and opportunities are key drivers of lifelong learning among elderly. *Attitude Towards Learning* also had a significant impact (β = .283, p < .001), indicating that a positive learning attitude can significantly enhance elderly learning engagement. *Digital Literacy* was also significant (β = .273, p < .001), but its impact was relatively small.

7. Discussion

This section discusses findings of international good practices and factors influencing elderly participation in lifelong learning in Beibei District. Both results highlight the importance of learning resources, learning attitudes and digital literacy in lifelong learning. In addition to these factors, good practices also provide valuable insights for elderly in Beibei District to participate in lifelong learning.

Good practices rely on strong educational resources, a hallmark of good practices in most countries. This aligns with findings in the United States and Malta, where accessible and structured environments not only foster participation but also enhance autonomy through volunteering and leadership opportunities (Eaton & Salari, 2005). Government-funded U3As and community day centers provide rent and teacher subsidies, demonstrating that incorporating elderly learning into public policy can reduce financial barriers and ensure sustainability (Formosa, 2012, p. 189).

Cultivating positive learning attitudes and motivation is crucial for elderly themselves, as it influences their confidence in mastering knowledge and, consequently, their learning outcomes (Zimmerman et al., 1992). In Finland, joining a girl rock band provides older learners with opportunities to empower themselves and boost their self-esteem, highlighting the role of enjoyable and self-affirming activities (Laes, 2015, p. 10). Consistent with research in Ecuador, language courses tailored to elderly preferred learning styles can enhance their motivation and persistence (Mora, Quito, & Sarmiento, 2017, p. 5).

Integrating health and well-being into lifelong learning programs aligns with numerous research findings. In the United States, lifelong learning directly supports healthy aging, with curricula integrating health and preventive care components (Grosso, 2018, p. 3). Comparative studies in Hong Kong and Australia also found that, despite cultural differences in caregiving norms, participation in late life learning consistently improves mental health and life satisfaction (Tam et al., 2016, p. 34).

With the advancement of digital technology, fostering digital literacy among elderly has become essential. In Europe, digital skills are explicitly positioned as core competencies for lifelong learning, supported by initiatives such as EPALE (Turkalj, Kelić, & Štimac, 2020, p. 5).

Intergenerational and community learning not only enriches the lives of older generations but also fosters the growth of younger generations. A program in the Czech Republic connects preschoolers with older learners, fostering mutual understanding and helping to dispel stereotypes about the elderly (Tallová, 2020, p. 44). Similarly, in Australia, "Neighborhood Houses" enable elderly to learn skills while building trust networks, alleviating loneliness, and strengthening community ties (Ollis et al., 2018, p. 67).

Policies, financial and family support mechanisms are also crucial for sustaining elderly participation in learning. According to Dhirathiti (2019), Thailand's co-production model brings together government, non-governmental organizations, communities, and families to provide lifelong learning opportunities, ensuring adaptation to local needs and encouraging collective responsibility (p. 216). In Malaysia, families encourage elderly to overcome loneliness through daily use of communication tools, which also helps them maintain motivation to learn basic digital skills (Ashaari, Ahmad, & Shahrill, 2023, p. 210).

Finally, flexible curricula and teaching methods are crucial. Japanese senior learning centers design curricula that combine reemployment training with cultural and health-related courses, reflecting the diverse goals of older learners (Le & Billett, 2022, p. 15).

Quantitative research results found that "Learning Resources" are the strongest factor influencing elderly participation in lifelong learning in Beibei District, followed by "Attitude Towards Learning" and "Digital Literacy", which are also significant and of comparable magnitude. At the sub-variable level, "Health Status" and "Digital Inclusion" have particularly significant impacts.

"Learning Resources" are the most important factor influencing elderly participation in lifelong learning ($\beta=0.345$, $p<0.001$). "Educational Resources" stands out most prominently, indicating that elderly are more likely to participate when courses and facilities are adequate. This is consistent with previous research, which suggests that learning resources for elderly are often limited or not prioritized (Findsen & Formosa, 2011; Fragoso & Fonseca, 2022). U3As face funding constraints, inadequate facilities, and weak faculty, resulting in limited enrollment and a limited variety of courses (Liu, 2013). "Social Attitude" also stands out, indicating that elderly are more likely to participate in lifelong learning when they feel recognized and encouraged by their families and communities. This aligns with the view that negative stereotypes about age and learning ability can undermine self-confidence and reduce learning engagement (Formosa, 2012; Fragoso & Fonseca, 2022). Following closely behind is "Teacher Quality and Teaching" which are crucial for maintaining elderly engagement. Liu and Zhou (2024) demonstrated that high-quality teachers can stimulate elderly interest in learning and enhance their confidence by imparting knowledge in a systematic, multidisciplinary, and professional

way that is accessible to elderly. However, many teachers in U3As are part-time and have not received professional training in senior education (Zhang et al., 2022).

"Attitude Towards Learning" has a significant impact on elderly participation in lifelong learning (β=0.283, p<0.001). Regarding "Health Status" elderly with better physical and mental health are more likely to participate in lifelong learning activities, a finding consistent with the WHO (2024). Regarding "Financial and Family Factors" elderly with stable incomes, pensions, or family support are more likely to participate in lifelong learning. This is consistent with the findings that financial security makes learning easier and more sustainable (Narushima et al., 2018; Wang et al., 2016). "Learning Attitude" often determines whether elderly choose to participate in learning. Numerous studies have demonstrated that a positive attitude can enhance motivation and enthusiasm for learning (Kara, 2009; Paul, 2017).

"Digital Literacy" also influences elderly participation in lifelong learning (β=0.273, p<0.001). The "Digital Inclusion" factor has a stronger influence, indicating that elderly are more likely to participate in digital learning when barriers such as lack of devices or poor internet access are reduced. This is consistent with the findings of Mohadis and Ali (2014), who found that barriers encountered by elderly using mobile phones significantly reduced their willingness to use mobile phones and their likelihood of participating in online learning. Regarding online learning, many U3As and community learning centers have begun offering "Online Learning," but some elderly still struggle to use these platforms due to a lack of adequate training. This problem confirms previous research showing that seniors often lack basic digital training, which reduces their ability to fully utilize online learning opportunities (Shi et al., 2023). Regarding "Digital Skills," many elderly remain limited to very basic functions such as sending messages or browsing the news. This is consistent with the findings of Vercruyssen et al. (2023), who found that fear of error and a lack of confidence in using smart devices prevented elderly from trying new features such as video calling and online payments.

8. Conclusion

This study examined international good practices for elderly participation in lifelong learning through documentary research. Based on Lichtman's (2013, p. 252) "3Cs" model, identified seven key concepts: "Diversity in access to educational resources," "Encourage positive learning attitudes and motivation in later life," "Integrate health and well-being into lifelong learning programs," "Promote digital literacy and bridge the digital divide," "Foster intergenerational and community learning to foster social inclusion," "Strengthening policy, financial, and family support mechanisms to enhance elderly participation," and "Flexible curriculum and pedagogical adaptation." These transferable principles can guide the adaptive development of lifelong learning for elderly in Beibei, and indeed in China. A questionnaire survey was also conducted to investigate the factors influencing elderly participation in Beibei District. The results showed that among the nine sub-variables, "Learning Attitude" and "Digital Inclusion" share the highest mean (both M=3.71). Meanwhile, "Learning Resources" were found to be the strongest influencing factor, while "Attitude Towards Learning" and "Digital Literacy" were also significant and comparable in magnitude.

While this study yielded reliable conclusions within its design, it also has some limitations. First, the survey was conducted only in Beibei District, limiting the scope of the sample from a single region. Second, the study employed thematic analysis to analyze the literature data, which is susceptible to subjective influences in the definition and classification of codes. Third, although international "good practices" provide valuable insights for lifelong learning among elderly in China, these practices cannot be completely copied or replicated due to differences between countries.

9. Recommendations

Based on the research findings, this section presents recommendations at the policy level (District/municipal/national) and the institutional level (U3As and community learning centers).

9.1 Policy Level

Rebalance urban and rural resources by extending evening and weekend learning venue hours, ensuring accessibility, and reducing costs through tuition waivers/vouchers and transportation subsidies. Digital inclusion should be standard (device loaners/subsidies, public Wi-Fi, "digital navigation" counters, anti-fraud and privacy courses). Elderly should be involved in curriculum design. U3As and communities should collaborate to prioritize equity, such as rural, low-income, and disabled populations, and track participation for flexible expansion.

The municipal government should develop curriculum and teaching standards for elderly, using accessible language and content. A program/course certification and recognition mechanism should be established. Funding should be allocated based on regional needs to support mobile learning units, with a focus on evaluating participation, completion, and equitable coverage. A city-wide online platform for elderly should be developed, including venues and course schedules, live/recorded broadcasts, and health consultations. A cross-departmental working group on elderly education (education, civil affairs, health, and information technology) should be established and published with independent evaluations and annual reports.

At the national level, first, establish a balanced grant program that allocates funds based on need. Second, in addition to grant funding, seniors can also receive age-tiered funding, with each tier increasing every five years (60/65/70 years, etc.). These vouchers can be used for compliant learning purposes. Third, collaborate with businesses to provide low-cost learning devices tied to learning purposes. Fourth, offline learning resource packages (paper version + USB flash drive/SD card) in multiple dialects can be provided for areas with poor internet connectivity. Fifth, cultivate a professional team of senior teachers and implement lifelong learning teacher certification.

9.2 Institution Level

U3As and community learning centers should prioritize access, streamline the registration process, foster learning motivation, and support digital adoption. Furthermore, fees should be kept low and, in partnership with community councils, they should reach the

very elderly, low-income, and people with disabilities. Curriculum and instruction should integrate health and well-being into the curriculum. A supportive and encouraging classroom atmosphere should be fostered. Curriculum should be co-designed with nearby schools, youth groups, and community organizations to enable elderly to learn while meeting local needs. Each U3A and community learning center should offer a "digital navigation" help point, short-term pre and post class consultations, and online delivery options. Furthermore, institutions should provide learning guidance for family members of elderly.

9.3 Recommendations for Further Study

Future research could be conducted in more regions of China, including cities with varying economic backgrounds, geographical locations, and population densities, to obtain a more diverse sample. Furthermore, future research could consider the impact of other variables on elderly participation in lifelong learning, such as the influence of artificial intelligence on elderly learning and lives, and the role of nursing homes in promoting lifelong learning among elderly in China. Additionally, future research could expand the participant pool beyond elderly to include not only teachers at U3As, but also family members of elderly and staff from departments related to elderly education, thus providing a more comprehensive study of elderly participation in lifelong learning.

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12. References

Adamczyk, M., & Budny, A. (2016). Lifelong learning as an important element of the social integration of the elderly. *Opuscula Sociologica*, 4, 81–93. Retrieved from https://doi.org/10.18276/os.2016.4-06

Ainsworth, H. L., & Eaton, S. E. (2010). *Formal, non-formal and informal learning in the sciences*. Onate Press.

Ashaari, M. F., Norhisham, N. A. S., Subramaniam, P., Manap, J., Khatidz, H. A., & Rasit, R. M. (2023). Adapting social supports through communication technologies as a lifelong learning for older adults. *Pakistan Journal of Life and Social Sciences*, 21(1), 205–220. Retrieved from https://doi.org/10.57239/PJLSS-2023-21.1.0017

Bhatia, P. G. (2015). Lifelong learning – learning to learn. *The Business & Management Review, 5*(4), 265–268.

Chen, X. D. (2012). A new way of spiritual support for the "empty nest elderly". *Chinese Civil Affairs*, (9), 46–47.

China Association of Elderly Education. (2021). *Annual report on the development of elderly education.*

Chongqing Municipal People's Government. (2022, January 13). *Beibei: Adhering to three directions, building four models, and improving elderly care services.* Retrieved from https://www.cq.gov.cn/ywdt/zwhd/qxdt/202201/t20220113_10299196.html

Dhirathiti, N. S. (2019). Co-production and the provision of lifelong learning policy for elderly people in Thailand. *Public Management Review, 21*(7), 1011–1028. Retrieved from https://doi.org/10.1080/14719037.2018.1540723

Eatock, D. (2015). *The silver economy: Opportunities from ageing.* European Parliamentary Research Service. https://coilink.org/20.500.12592/wmj4x0

Eaton, J., & Salari, S. (2005). Environments for lifelong learning in senior centers. *Educational Gerontology, 31*(6), 461–480. Retrieved from https://doi.org/10.1080/03601270590928189

Eshach, H. (2007). Bridging in-school and out-of-school learning: Formal, non-formal, and informal education. *Journal of Science Education and Technology, 16*(2), 171–190. Retrieved from https://doi.org/10.1007/s10956-006-9027-1

Fang, Z., & Sim, N. (2024). Does lifelong learning matter for the subjective wellbeing of the elderly? A machine learning analysis on Singapore data. *PLOS ONE, 19*(6), e0303478. Retrieved from https://doi.org/10.1371/journal.pone.0303478

Findsen, B., & Formosa, M. (2011). *Lifelong learning in later life: A handbook on older adult learning.* Sense Publishers.

Formosa, M. (2012). Lifelong education for older adults in Malta: Current trends and future visions. *International Review of Education, 58*(3), 271–292. Retrieved from https://doi.org/10.1007/s11159-012-9282-8

Fragoso, A., & Fonseca, J. (2022). Combating ageism through adult education and learning. *Social Sciences, 11*(3), 110. Retrieved from https://doi.org/10.3390/socsci11030110

General Office of the State Council. (2016, October 19). *Notice of the General Office of the State Council on the issuance of the Development Plan for Elderly Education (2016–2020).* Retrieved from https://www.gov.cn/zhengce/content/2016-10/19/content_5121344.htm

Grosso, T. (2018). Lifelong learning: The key to successful aging. *Journal of Educational Leadership in Action*, 5(2), Article 10. Retrieved from https://doi.org/10.62608/2164-1102.1046

Hansen, R. J., Talmage, C. A., Thaxton, S. P., & Knopf, R. C. (2019). Enhancing older adult access to lifelong learning institutes through technology-based instruction: A brief report. *Gerontology & Geriatrics Education*. Advance online publication. Retrieved from https://doi.org/10.1080/02701960.2019.1618852

He, W., Jiang, L., Ge, X., Ye, J., Yang, N., Li, M., Wang, M., & Han, X. (2020). Quality of life of empty-nest elderly in China: A systematic review and meta-analysis. *Psychology, Health & Medicine*, 25(2), 131–147. Retrieved from https://doi.org/10.1080/13548506.2019.1695863

Iancu, I., & Iancu, B. (2020). Designing mobile technology for elderly: A theoretical overview. *Technological Forecasting & Social Change*, 155, 119977. Retrieved from https://doi.org/10.1016/j.techfore.2020.119977

Joseph, D., & Human, R. (2020). "It is more than just about music": Lifelong learning, social interaction and connection. *International Journal of Lifelong Education*, 39(5), 543–559. Retrieved from https://doi.org/10.1080/02601370.2020.1817395

Kara, A. (2009). The effect of a 'learning theories' unit on students' attitudes toward learning. *Australian Journal of Teacher Education*, 34(3), 100–115. Retrieved from https://doi.org/10.14221/ajte.2009v34n3.5

Laes, T. (2015). Empowering later adulthood music education: A case study of a rock band for third-age learners. *International Journal of Music Education, 33*(1), 51–65. Retrieved from https://doi.org/10.1177/0255761413515815

Le, A. H., & Billett, S. (2022). Lifelong learning and adult education in Japan. *Australian Journal of Adult Learning, 62*(3), 417–438. Retrieved from http://hdl.handle.net/10072/414731

Li, L., Gao, W., & Xue, Y. (2022). Analysis of the factors on learning digital cultural products for the elderly under active aging: The case of lifelong learning in China. In *2022 IEEE 2nd International Conference on Educational Technology (ICET)* (pp. 175–179). IEEE. Retrieved from https://doi.org/10.1109/ICET55642.2022.9944454

Li, L., Li, L., & Wan, Y. (2021). Intergenerational caregiving and role conflict in elderly social participation from the perspective of active ageing: An analysis based on social role theory. *Administrative Management Reform*, (5), 71–78. Retrieved from https://doi.org/10.14150/j.cnki.1674-7453.20210210.001

Lichtman, M. (2013). *Qualitative research for the social sciences*. SAGE Publications.

Liu, C. (2013). *Study on development of community college in China based on lifelong learning*. A doctoral dissertation. China University of Mining and Technology.

Liu, L. J., & Zhou, K. (2024). Professionalization of elderly education teachers: Why it is possible and how it can be achieved. *Adult Education*, (10), 41–47. Retrieved from https://doi.org/10.3969/j.issn.1001-8794.2024.10.007

Maarschalk, J. (1988). Scientific literacy and informal science teaching. *Journal of Research in Science Teaching, 25*(2), 135–146.

Maulod, A., & Lu, S. Y. (2020). "I'm slowly ageing but I still have my value": Challenging ageism and empowering older persons through lifelong learning in Singapore. *Educational Gerontology, 46*(10), 628–641. Retrieved from https://doi.org/10.1080/03601277.2020.1796280

Ministry of Education of the People's Republic of China. (2021). *14th five-year plan for aging and education development.*

Mohadis, H. M., & Ali, N. M. (2014). A study of smartphone usage and barriers among the elderly. In *2014 3rd International Conference on User Science and Engineering (i-USEr)* (pp. 109–114). IEEE. Retrieved from https://doi.org/10.1109/i-USEr.2014.7009734

Mora, J., Quito, I., & Sarmiento, L. (2017). A case study of learning styles of older adults attending an English course. *Maskana, 8*(2), 1–15. Retrieved from https://doi.org/10.18537/mskn.08.02.01

Mubarak, F., & Suomi, R. (2022). Elderly forgotten? Digital exclusion in the information age and the rising grey digital divide. *INQUIRY: The Journal of Health Care Organization, Provision, and Financing, 59*, 1–7. Retrieved from https://doi.org/10.1177/00469580221096272

Muñoz-Rodríguez, J. M., Hernández-Serrano, M. J., & Tabernero, C. (2020). Digital identity levels in older learners: A new focus for sustainable lifelong education and inclusion. *Sustainability, 12*(24), 10657. Retrieved from https://doi.org/10.3390/su122410657

Narushima, M., Liu, J., & Diestelkamp, N. (2018). Lifelong learning in active ageing discourse: Its conserving effect on wellbeing, health and vulnerability. *Ageing & Society, 38*(4), 651–675. Retrieved from https://doi.org/10.1017/S0144686X16001136

Ollis, T., Starr, K., Ryan, C., & Harrison, U. (2018). Learning across the lifespan: Lifelong learning in Neighbourhood Houses in Australia. *Australian Journal of Adult Learning, 58*(3), 449–478.

Organisation for Economic Co-operation and Development. (2020). *Promoting an age-inclusive workforce: Living, learning and earning longer.* https://doi.org/10.1787/59752153-en

Park, N.-M. (2024). The digital divide and challenges on the elderly in intelligence information society. *Journal of Digital Policy, 3*(1), 11–20. Retrieved from https://doi.org/10.23149/JDP.2024.3.1.011

Paul, S. S. (2017). Active and passive learning: A comparison. *GRD Journals – Global Research and Development Journal for Engineering, 2*(9), 27–29.

Pihlainen, K., Ehlers, A., Rohner, R., Cerna, K., Kärnä, E., Hess, M., Hengl, L., Aavikko, L., Frewer-Graumann, S., Gallistl, V., & Müller, C. (2023). Older adults' reasons to participate in digital skills learning: An interdisciplinary, multiple case study from Austria, Finland, and Germany. *Studies in the Education of Adults, 55*(1), 101–119. Retrieved from https://doi.org/10.1080/02660830.2022.2133268

Shi, Y., Ma, D., Zhang, J., & Chen, B. (2023). In the digital age: A systematic literature review of the e-health literacy and influencing factors among Chinese older adults. *Journal of Public Health: From Theory to Practice, 31*, 679–687. https://doi.org/10.1007/s10389-021-01604-z

Sohu News. (2024, December 14). *Beibei Vocational Education Center in Chongqing organizes digital empowerment for the elderly skills training and experience event.* https://www.sohu.com/a/837138644_121364306

Standing Committee of the National People's Congress. (1996). *Law of the People's Republic of China on the protection of the rights and interests of the elderly*. The State Council of the People's Republic of China. https://www.gov.cn/guoqing/2021-10/29/content_5647622.htm

State Council of the People's Republic of China. (2021, March 13). *Outline of the 14th five-year plan for national economic and social development and long-range objectives for 2035*. The State Council of the People's Republic of China. https://www.gov.cn/xinwen/2021-03/13/content_5592681.htm

State Council of the People's Republic of China. (2024, January 11). *Opinions on developing the silver economy to enhance elderly well-being* (Document No. 1, 2024). Retrieved January 15, 2024, from https://www.gov.cn/zhengce/content/202401/content_6926087.htm

Tallová, B. (2020). Mezigenerační vztahy mezi dětmi předškolního věku a seniory [Intergenerational relationships between preschool children and the elderly]. *Lifelong Learning – celoživotní vzdělávání, 10*(3), 333–351. Retrieved from https://doi.org/10.11118/lifele20201003333

Tam, M. S.-L., Aird, R., Boulton-Lewis, G., & Buys, L. (2016). Ageing and learning as conceptualized by senior adults in two cultures: Hong Kong and Australia. *Current Aging Science, 9*(3), 1–17. Retrieved from https://doi.org/10.2174/1874609809666160506121845

Tierney, A. T., Patel, A. D., & Wong, P. C. M. (2023). Lifelong musical training offsets age-related decline in audiovisual speech perception. *Science Advances, 9*(41), eadg7056. Retrieved from https://doi.org/10.1126/sciadv.adg7056

Turkalj, D., Kelić, I., & Štimac, H. (2020). Lifelong learning perspectives and effects in the aging society segment through the utilization of digital technologies. *Economic and Social Development: Book of Proceedings*, 1, 437–446.

UNESCO Institute for Lifelong Learning. (2015). *Lifelong learning: Definition and goals*. Retrieved December 9, 2023, from https://uil.unesco.org/lifelong-learning

UNESCO Institute for Lifelong Learning. (2023). *Lifelong learning*. Retrieved September 2023, from https://uil.unesco.org

United Nations Department of Economic and Social Affairs. (2020). *Government policies to address population ageing*. Retrieved from https://www.un.org/development/desa

United Nations Department of Economic and Social Affairs. (2021). *World population ageing 2020: Highlights*. Retrieved from https://doi.org/10.18356/9789210051934

Vercruyssen, A., Schirmer, W., Geerts, N., & Mortelmans, D. (2023). How "basic" is basic digital literacy for older adults? Insights from digital skills instructors. *Frontiers in Education, 8*, 1231701. Retrieved from https://doi.org/10.3389/feduc.2023.1231701

Wang, R., De Donder, L., De Backer, F., Li, S., Pan, H., Thomas, V., & Lombaerts, K. (2016). Back to school in later life: Older Chinese adults' perspectives on learning participation barriers. *Educational Gerontology, 42*(9), 646–659. https://doi.org/10.1080/03601277.2016.1205385

Wilson, R. S., Barnes, L. L., & Bennett, D. A. (2012). Assessment of lifetime participation in cognitively stimulating activities. *Journal of the American Geriatrics Society, 60*(1), 140–147. Retrieved from https://doi.org/10.1111/j.1532-5415.2011.03777.x

World Health Organization. (2002). *Active ageing: A policy framework*. Retrieved from
https://apps.who.int/iris/handle/10665/67215

World Health Organization. (2024). *World health statistics 2024: Monitoring health for the
SDGs, Sustainable Development Goals*. Retrieved from
https://www.who.int/publications/book-orders

Zhu, Y., & Zhou, M. (2023). Research on the development of community geriatric education from
the perspective of active aging. *Aging Research, 10*(3), 850–854. Retrieved from
https://doi.org/10.12677/ar.2023.103110

Zimmerman, B. J., Bandura, A., & Martinez-Pons, M. (1992). Self-motivation for academic
attainment: The role of self-efficacy beliefs and personal goal setting. *American
Educational Research Journal, 29*(3), 663–676. Retrieved from
https://doi.org/10.3102/00028312029003663

Zhang, H., Meng, X., & Wu, Y. (2022). Research on the dilemma of digital learning application
in elderly education and its bridging strategies. *Adult Education*, 2022(11), 37–44.
https://doi.org/10.3969/j.issn.1001-8794.2022.11.005