

**Rural Chinese Older Adults Use of Social Media as a Learning Tool: Opportunities and
Obstacles to Learning**

by

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ABSTRACT

Because of the development of digital technology, social media is becoming an indispensable software in everyone's mobile phones and computers. The rise of social media has led educators and learners to explore the possibilities of integrating it into the field of learning. Social media's unique features of personalisation, comprehensiveness and breadth make it an invaluable learning tool. In China's vast rural areas, social media is gradually becoming a major learning tool for older adults. However, in such an era of rapid development of the Internet and social media, older people in rural areas, who are in a weaker position in the composition of all Internet users, are becoming more and more marginalised.

Currently, academics widely discuss how social media are used by students in their learning, but few studies have focused on the use of social media for learning by older adults in rural China, nor have they examined what social media older adults in rural China use for learning, and what is the current situation they face in their learning. Therefore, it is important to understand the experiences of rural Chinese older learners using social media as a means of learning in order to better integrate social media technologies into the learning of rural older adults, which can contribute to the development of education as well as the ability of rural older adults to develop themselves.

This qualitative study captured the experiences of older learners using social media as a learning tool through interviews in Mulan Township, Wuhan City, Hubei Province, China. Four participants took part in this study through semi-structured interviews, all of whom were between 60 and 75 years old, spoke Mandarin, and at the time of the interviews had at least 1-3

years of experience in using social media for learning. The data analysis methodology of grounded theory was used in this study, specifically, through a three-step process, open, axial, and selective coding were extracted from the raw data, and these codes were combined into different main categories and elements based on the research questions. This study concludes that social media has now become a major learning tool for older adults in rural China, and that in using social media for learning, there are benefits such as security and content richness, but there are also challenges such as information leakage and lack of instruction.

Finally, based on the results of this study, some suggestions for future research and practice are made, such as investigating the influence of family members on older adults' use of social media as a learning tool.

Keywords: adult learning, self-directed learning, China, older adults, social media, learning tools, grounded theory

PREFACT

This thesis is an original work by Zhongrui Wang. The research project, of which this thesis is a part, received research ethics approval from the University of Alberta Research Ethics Board, Project Name “Rural Chinese Older Adults Use of Social Media as a Learning Tool”, No. Pro00126667, February 7, 2023.

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Chapter 1: Introduction

Since the 21st century, the Internet has gained great momentum and ordinary people are free to use the Internet to access information in their daily lives, which has had an impact on many fields such as culture, politics, economics, education, and art (Greenhow et al., 2009). Learning, education, and technology have always been interdependent in the history of human development, and the development of technology can bring about advances in learning and education in many ways (Taylor, 1995). With the increased use of the Internet in education settings, adult education researchers have devoted themselves to the study of online learning, which has contributed greatly to the development of online learning and helped many students to acquire knowledge through alternate delivery formats (Hiltz & Turoff, 1993). As the Internet has become more ingrained in people's lives a large number of social media platforms have started to emerge. Consequently, students and educators have used social media in ways that have changed traditional classroom teaching methods, which has created new learning opportunities (LeNoue et al., 2011). In this chapter, I explore the problem statement of this study, the purpose of the study, the significance of the study, and the definitions of important terms.

Problem Statement

As mentioned above, the use of some new technologies has become evident, especially in the area of social media. With the proliferation of computers and smartphones, people can use social media to access a vast amount of information more easily than ever before (Victor, 2012). Nowadays, social media such as Weibo and WeChat are increasingly becoming the main way of accessing and disseminating information in people's lives (Zhao & Zhao, 2017). A study

reported that Sina Weibo reached 536 million registered users in the first quarter of 2013 and Tencent Weibo reached 507 million registered users in the third quarter of 2012, while the number of Chinese Internet users was about 564 million in the same period, and Weibo registered users are close to the number of Chinese Internet users (Tencent, 2022). With over 1.2 billion active users worldwide, WeChat is the most active social networking software in mainland China (WeChat, 2022).

In such an era of rapid social media popularity, the way of education and learning has also changed dramatically (Kolokytha, 2015). Based on the huge population of social media users, the function of social media is not limited to basic communication, but many educators and learners use social media as a tool for education or learning, and one very special group of learners is the elderly learners in rural China (Kolokytha et al., 2015). A large number of rural Chinese seniors are learning through social media, and the characteristics of social media fit well with the learning needs of Chinese seniors. First, social media can be used to learn in fragmented time. Most older adults need to help their children take care of their children, so they can only use fragmented time to learn. By using social media to learn, there is no fixed learning time and you can adjust the length of learning according to your needs, which is very much in line with the habits of the elderly. Secondly, many elderly people in China have only one child and spend a lot of time at work every day, leaving no time to understand and teach the elderly. Seniors often use social media to relieve their loneliness.

Social media has the feature of learning anytime and anywhere, and seniors can comment on the learning content at any time, and sometimes they can communicate with their classmates

who are learning together through social media. Finally, senior colleges with fixed class times and locations are expensive and difficult to access. Chinese senior colleges are usually located in the center of the city, some distance away from residential areas, and seniors need to drive or take transportation to get to the college. However, not many seniors in rural China can drive, and public transportation is difficult for seniors in poor health, so seniors are reluctant to go to senior colleges. For example, at a senior citizen university in Wuhan, Hubei Province, China, the average tuition fee for a class is 150-300 RMB (30-60 CAD), which is not a small burden for older people. In addition, traditional learning programmes for older people, such as universities or classes for older people, are very homogeneous, with one university in Wuhan, for example, offering courses in three areas: musical instruments, calligraphy and sports, which do not meet the needs of older people in the changing social reality. For these reasons, older people prefer the diversity of learning areas offered by social media to traditional learning methods.

Since the inception of social media, there are many educationalists and researchers who have explored its potential to work with different groups and in different fields. In particular, social media has gained more attention as a learning tool since the new crown epidemic pandemic forced many schools to suspend offline instruction and move to online delivery (Rajeh et al., 2021). There is a growing body of research on social media in educational contexts, with many studies addressing the use of social media as a learning tool for primary, secondary, and university student populations (Castro-Romero, 2015; Kolokytha et al., 2015; Rajeh et al., 2021). Given that many older adults now use social media for learning, there is still a gap in current research about understanding and exploring the use of social media for learning among older

adults in rural China. Furthermore, there is a gap in research focusing on what social media platforms older adults in rural China use for learning and what the current situation is that they face in learning.

The only relevant research findings show that older adults use new learning tools mainly to explore their learning interests, expand their social relationships, and make up for the lack of social interactions, but some older adults still lack confidence in using new learning tools due to their lack of interest in social media or online learning, the complexity of operating the software, and their physical factors that hinder them (Limone et al., 2018). González et al. (2015) showed that increased exposure to technology, such as computers, smartphones, and social media, can increase older adults' self-confidence, thus improving their learning outcomes and helping them to re-enter the workforce and participate in society. Most of the existing studies focus on older adults in developed countries or more economically developed areas, while the vast majority of older adults live in developing countries, small cities or rural areas. They are not as socially privileged, but their experiences with social media as a learning tool deserve attention.

Purpose of the Study

The purpose of this study was to better understand the learning experiences of older Chinese rural learners who use social media as a learning tool in the context of the rapid development of social media. In this study I investigated the factors influencing the social media-based learning of the elderly and the barriers to social media-based learning of the elderly, and to explore the countermeasures to improve the social media-based learning of the elderly in rural China, so as to create a more suitable social media-based learning environment for the elderly in rural China.

To understand the experiences of these individual learners, this study includes an exploration of various types of social media platforms such as QQ, WeChat, Tiktok, and Weibo, perceptions of the benefits of social media as a learning tool, and perceptions of the challenges of using social media as a learning tool.

Significance of the Study

There are many reasons for studying the use of social media as a learning tool among older adults in rural China. First, a systematic and comprehensive literature review and an examination of the realities of older adults in China reveals that much of the current research on adult education has focused on developed countries, with little research on developing countries and even less research on adult education for specific groups in developing countries. In this study, we plan to investigate the current situation and needs of Chinese older adults in learning through social media, which accounts for nearly 20% of the total population in China, and help Chinese older adults learn more effectively through social media. This is a current need of Chinese older adults, and an area that many studies have not focused on. Therefore, this study has very important theoretical and practical implications.

Second, social media has many advantages in helping learners to access information, and many researchers have recognized the role of social media (Stathopoulou et al., 2019). However, worldwide research on the use of social media in older age groups is mostly focused on urban areas, on the one hand, urban older age groups have a relatively higher level of living, convenience, and education, which is conducive to conducting relevant research, on the other hand, rural older age groups have increased the difficulty of scholars' research due to factors

such as living area, economic conditions, and literacy level, so social media use in rural older age groups. This also provides a unique perspective for this paper. Studying the use of social media for learning among rural elderly groups in China today can present the motivation, content and other relevant elements of social media learning among rural elderly people, and then explore how to improve the effectiveness of social media-based learning among elderly people, which can help enrich the research field and research content of Chinese elderly education issues. Moreover, this study focuses on the issue of educational tools for rural elderly groups in China, which can promote the systematization of research on elderly education in China. It helps to enrich and develop the study of aging society and theoretical studies related to the learning of the elderly, presenting the diversity of rural China and exploring the characteristics of the use of the elderly group in the process of social media popularity.

In addition, human beings are social animals, and their survival and development require participation in certain social activities, while social activities and interactions are conducive to the perfection of people's character, the maintenance of good health and psychological condition, and the enhancement of life happiness and satisfaction (Zhao & Zhao, 2017). Because of the degeneration of their physical and physiological functions, the activity radius of the elderly group is greatly reduced compared to that of young people, and they are not willing to spend much time to study at the university for the elderly in the city center, and it is also difficult to obtain new learning information, so many elderly people in China develop psychological diseases (Yu, 2021).

In the context of the rapid development of social media, it is particularly necessary to study the impact of social media on the learning of rural older adults, which helps to explore the methods and paths to improve the quality of learning of older adults from the perspective of social media. By interpreting and reflecting on the social media-based learning of rural older adults in China, it is beneficial for researchers and older adults to broaden their own learning paths in social media platforms.

Moreover, I think the research results can be applied to social media development, which can help social media developers understand how Chinese older adults use social media for learning and what difficulties older adults have in using social media for learning. This will enable developers to develop social media that is more suitable for Chinese older adults, and it will also enable adult education teachers to understand how to use social media more effectively to help older adults learn. This will help to further broaden the development of senior education and provide an effective path for the development of senior education. In addition, with the advantages of social media in learning, it can help rural elderly people continue to socialize and enrich their spiritual and cultural life, which can play a positive role in improving the mental state of rural elderly people, improving their confidence in life and developing good social adaptation ability.

Definitions of Terms

The following are definitions of key terms in this paper to better enable the reader to understand and clarify key concepts and to identify their use in this study.

Older Adults

The Social Science Dictionary states that older people are those who have reached or exceeded the age of old age (Craig, 2002). The criteria for age classification of older people are inconsistent across countries and regions and have evolved over history. According to the World Health Organization (2022) definition, people over 60 years of age are called elderly. However, there are some countries that use 65 years of age as a cut-off. In the case of Chinese law, Article 2 of the Law of the People's Republic of China on the Protection of the Rights and Interests of the Elderly states that all citizens of the People's Republic of China who have reached the age of 60 are considered elderly (Hu, 2012).

Generally speaking, the elderly have physiological characteristics such as slow metabolism, declining resistance, and declining physiological functions. The graying of hair, eyebrows, and beard is also one of the most obvious characteristics of the elderly, some of them will grow age spots, and some of them sometimes have symptoms such as transient memory loss. In addition, Chinese society has a tradition of respecting the elderly and a strong family concept, which occupies an important position in the family, and the elderly play an important role in the family, and most of them are respected and loved by the younger generation. In summary, this paper defines people aged 60 years and above, who are in the last cycle of life, as the elderly. It is worth noting that physiological age is not the only criterion for measuring older people, but the concept of older people also includes various measures such as psychological age, social age and chronological age. This study adopts the criterion of physiological age, which is easier to research and write, more objective and more convincing.

Social Media

A platform for content creation, exchange and information sharing built from the user relationship chain with the help of modern information technology, which involves instant messaging software such as Facebook, Tiktok, QQ, WeChat, Weibo, and other diversified platforms with community as the model from a broad perspective.

Learning

In terms of the definition of learning, learning is a process in which learners acquire knowledge or skills by reading, practicing, thinking, etc. Learning is a process of self-change and self-improvement, as well as a process of achieving changes in thinking, cognition, and skills (Lachman, 1997). In terms of how learners learn knowledge, it can be divided into formal, informal and non-formal learning. The "learning" mentioned in this paper, "using social media to learn", mainly refers to informal learning, which includes learning activities that occur in informal settings such as learners' daily work, life, and social life. At present, social media affects every aspect of our lives, including life, social life and work. Therefore, learning in this paper mainly refers to informal learning that uses social media as a tool.

Mobile Learning

Mobile learning is a kind of learning that can occur at any time and any place with the help of mobile computing devices, which must be able to effectively present learning content and provide two-way communication between teachers and learners (Dye et al., 2003). As a new way of learning, and a special kind of digital learning, mobile learning is a core feature of learning anytime and anywhere (Dye et al., 2003). And the occurrence of mobile learning is not

only said to be limited to the interaction between teachers and learners, but also the interaction between learners and learners as well as the independent learning of learners themselves belong to the scope of mobile learning (Dye et al., 2003). Based on the above understanding, this paper summarizes mobile learning as a new type of learning method based on wireless network communication technology and smartphone learning devices, which enables access to learning information and learning resources anytime and anywhere.

Informal Learning

Informal learning is generally defined as any learning outside of formal learning, but it is a broader and looser concept than formal learning. In the discussion of informal learning, researchers have also focused on the place where learning occurs (outside of the formal education system), the mode of learning (determined by the learner), the content of learning (determined by the learner), and the outcome of learning (the learner does not receive a diploma or certificate) (Callanan et al., 2011). This study argues that the place where learning occurs should not be overemphasized, because informal learning can occur both outside and inside the formal education system, and whether or not diplomas and certificates are obtained is not the core of the distinction between formal and informal learning, but should be highly concerned with whether learners' learning occurs under the arrangement, requirement, and organization of others, or whether learners' learning occurs based on their personal experiences, needs, and interests. In addition, some researchers have emphasized the unconscious nature of informal learning, and some even believe that informal learning is unconscious (Hoekstra et al., 2007). The present study does not agree with this, but believes that any learning should be conscious in

nature, even though the focus of measurement is different from different perspectives.

Therefore, this study argues that informal learning, because of its weak predictability and the social and contextualized way it is conducted, and the unstructured and non-institutionalized nature of the learning content, sometimes shows a lack of planning or even no planning, but this is not its norm, and true informal learning is a truly personal and authentic learning that is determined, responsible, and regulated by the learners themselves. As Marsick and Watkins (2015) suggest, although informal learning relies on a great deal of tacit knowledge, one thing is still certain: it is often intentional and perhaps even planned. This study argues that informal learning is a type of learning activity relative to formal learning. Specifically, informal learning is a bottom-up learning activity in which learners self-organize, self-determine, and self-motivate in their daily work and life based on their needs and interests. For example, reading books, reading newspapers, watching TV (movies), blogging, journaling, surfing the Internet, studying, salons, games, socializing, talking, teamwork, and so on.

Rural Area

There are two definitions of rural in existing research, one is to divide rural and urban based on population, for example according to the United States Department of Agriculture rural is a place with a population density of less than 500 people per square mile (United States Department of Agriculture, 2019). The other is to divide rural and urban based on the function of the area, in this definition rural is an area that assumes the function of agriculture and people living in rural areas use agriculture as their main source of income (Wikipedia, 2023). Rural areas are dominated by agricultural industries, including various farms, forestry and vegetable

production. In this study, which divides rural areas and towns based on their functions, rural areas are defined as areas that are outside of cities and have agricultural functions.

Technically Proficient

A technologically proficient person is someone who has sufficient knowledge of the use of personal computers, smart devices, some software and online applications, and uses these technologies to access information.

Platform

A platform is a web-based tool or technology designed to create online connections, such as social media, over the Internet and accessible from different devices (e.g., computers, smartphones). Platforms can generate and exchange multiple forms of content, such as videos, images, and text (Röstlund, 2013). In this study's definition, a platform does not produce information directly; it is an intermediary between information producers and information receivers, and platforms take many forms, such as computer software or smartphone software.

Chapter Outline

Chapter 1 first explains the current situation of social media and population aging in China, and discusses the recent increasing use of social media in education because of its personalized, comprehensive, and widespread characteristics. A large number of older people in China learn through social media, where social media such as Weibo, WeChat, and Tiktok are increasingly becoming the main ways to obtain and distribute information in people's lives. In addition, Chapter 1 reveals that older people in rural areas of China, are disadvantaged in the composition of all Internet users, and that social media development is biased towards the interests of young

people's hobbies as well as interests, mostly automatically ignoring the learning needs of older people over 60 years old. Although there are various studies that show that when social media is used as an educational tool, it has many advantages it is beneficial and can help in the learning process of the learners. However, there is still a gap in the current research regarding understanding and exploring the use of social media for learning among older adults in rural China, and there is no literature that focuses on what social media older adults in rural China use for learning and what the current situation they face in learning is. The purpose of this qualitative study was to explore older rural learners' use of social media as a learning tool by interviewing and collecting data on older Chinese learners' perceptions and experiences of using social media for learning. Chapter 1 provides an overall introduction to the thesis, describing the background of the study, the purpose of the study, the significance of the study, and the definition of terms. In the next chapter, the current status of the development of the various theories mentioned in this chapter is described in detail, and various cases and practices related to this study are summarized and their relevance to this study is clarified.

Chapter 2: Literature Review

This study examines the phenomenon of older learners' use of social media as a learning tool. Specifically, this study focuses on older learners in rural China, as many older Chinese in rural areas currently use social media as a learning tool for perception and experience for a variety of reasons. This literature review is divided into three main sections, which are Chinese older adult learning, informal learning, and social media. This chapter provides an introduction to older adults in China and rural China, identifying the theoretical underpinnings of social media use, informal learning, self-directed learning, mobile learning, and older adult learning in an educational context. To explain how social media is used as a learning tool for older learners in China, the chapter reviews the particularities of older learners and analyzes how they differ from child and adolescent learners. Finally, the chapter reviews the relevant literature and research findings related to online learning and social media in an educational context.

China and Chinese Older Adult Learning

China is a very vast country, and different regions have different climates, economic conditions, crops, and terrain. Chinese seniors also have their own unique and distinctive learning needs and learning styles from those of other countries. In that section I provide a basic introduction to the current situation in China to help understand the country. And I summarize the literature on older adults' learning in China and the world to show the uniqueness of older adults' learning in China.

About China

Basic Information about China. China, formally known as the People's Republic of China, is a country in East Asia and has until now been the most populous country in the world, with a population of over 1.4 billion (National Bureau of Statistics of China, 2021). China spans five time zones and shares borders with fourteen countries. It covers an area of approximately 9.6 million square kilometres (3,700,000 square miles), making it the fourth largest country in the world in terms of area (National Bureau of Statistics of China, 2021). The capital of China is Beijing and the most populous city and largest financial centre is Shanghai. China is currently a unified socialist country ruled by the Communist Party of China (Wei, 2018). The Chinese Constitution stipulates that the People's Republic of China is a socialist state under the democratic dictatorship of the people based on an alliance of workers and peasants under the leadership of the working class, and that state institutions are governed by the principle of democratic centralism (Wei, 2018).

China is a permanent member of the United Nations Security Council and a founding member of multilateral and regional cooperation organisations such as the Asian Infrastructure Investment Bank, the BRICS New Development Bank, the Shanghai Cooperation Organisation and the RCEP. It is also a member of the BRICS, G20, APEC and the East Asia Summit. China accounts for about one-fifth of the world economy and is the world's second largest economy in terms of nominal GDP and the largest in terms of purchasing power parity (PPP). By 2021, China will account for approximately 18% of the world economy in terms of nominal GDP (International Monetary Fund, 2023). China is one of the fastest growing major economies in the

world and has maintained a growth rate of over 6% since the introduction of economic reforms in 1978 (World Bank, 2018). According to the World Bank, China's GDP has grown from CA\$202.5 billion in 1978 to CA\$23.94 trillion in 2021 (World Bank,2021).

China's climate is dominated by dry and wet monsoons, with significant temperature differences between winter and summer. In winter, the northern winds from the higher latitudes are cold and dry; in summer, the southern winds from the lower coastal areas are warm and humid. The climate in much of China is ideal for agriculture and the country has been the world's largest producer of rice, wheat, tomatoes, aubergines, grapes, watermelons, spinach and many other crops (Fu, 2008).

According to the 2020 National Census, the population of the People's Republic of China is approximately 1,411,778,724. According to the 2020 Census, approximately 17.95% of the population is aged 14 years or younger, 63.35% is aged between 15 and 59 years, and 18.7% is aged 60 years or older (National Bureau of Statistics of China, 2021). China has the largest education system in the world with approximately 282 million students and 17.32 million full-time teachers in over 530,000 schools (National Bureau of Statistics of China, 2021).

In February 2006, the government pledged to provide completely free nine-year education, including textbooks and tuition fees. Annual investment in education has increased from less than CA\$67.5 billion in 2003 to over CA\$1103 billion by 2020 (Ministry of Education of the People's Republic of China, 2023). However, inequalities in education spending remain. In 2010, the annual per capita education expenditure for secondary school students in Beijing was CA\$4004.6, compared to CA\$640.8 in Guizhou, one of China's poorest provinces (Roberts,

2013). Free and compulsory education in China covers primary and lower secondary education for ages 6 to 15. In 2020, the compulsory education graduation rate reaches 95.2%, exceeding the average for high-income countries, and about 91.2% of Chinese people have received secondary education (Ministry of Education of the People's Republic of China, 2023).

Current Status of Population Aging in China. Population aging is one of the main effects of the rapid development of modern society, and the increase in modern life expectancy reflects advances in medicine, technology, social environment, and elderly care (Yu, 2021). But population aging also poses a great challenge to today's society and has become an important issue that has to be taken into account in the continued development of society. According to the classification criteria established by the United Nations in 1956, a country or region is aging when the number of people aged 65 years and older exceeds 7% of the total population (Ince, 2015).

Data from the seventh Chinese census show that in 2020, there were 264.02 million people aged 60 years or older in China, accounting for 18.70% of the total population, including 190.64 million people aged 65 years or older, accounting for 13.50% of the total population (National Bureau of Statistics of China, 2021). This indicates that China's elderly population is growing year by year, the aging phenomenon is intensifying, the process of an aging society is accelerating, and China's population structure is showing an elderly state, making it one of the most serious aging countries in the world. The report of the 19th National Congress of the Chinese government also points out that in the face of China's increasingly serious aging situation, active measures should be taken to encourage the joint development of all parties,

build a policy system and social environment for the elderly, promote medical care for the elderly, and accelerate the development of elderly-related industries (Xi, 2017). Aging has become an important concern for the Chinese government, and actively responding to population aging has become a long-term strategic task for China (Xi, 2017).

China is a large agricultural country, and before the reform and opening up, the rural population accounted for a large proportion of the total population (Yu, 2021). With the gradual progress of reform and opening up, China's industrialization and urbanization have accelerated, and a large number of young and strong rural laborers have moved to the cities to work, gradually realizing the transfer from rural to urban areas, and the loss of young and strong rural laborers is serious. The elderly population in rural areas continues to rise, and nationally, the proportion of people aged 60 and 65 and above in rural areas is 23.81% and 17.72%, respectively, 7.99 and 6.61 percentage points higher than that in urban areas (National Bureau of Statistics of China, 2021).

The aging phenomenon in rural China continues to grow, and the proportion of elderly people in the population composition of rural areas is increasing. The number of elderly people is growing, but the corresponding economic security, health care, and elderly care policies are lagging behind the actual situation. To a certain extent, rural older people become socially isolated (Xi, 2017). On the one hand, rural aging increases the burden of old age, and the pressure on offspring is multiplied by relying solely on family support models in the face of poor rural elderly services. On the other hand, rural elderly live longer, and the quality of life of the elderly in their later years as well as the tightness of social ties need to be enhanced and

improved to reduce the difficulties of social integration brought about by increasing age (Yu, 2021). In the present time, China is aging deeply, the issue of elderly development needs to be considered comprehensively, and in the context of the relatively backward urban-rural dual structure of rural areas, the issue of rural aging needs more attention.

Learning Needs of Older Adults

Older people's need to learn is very different from that of adolescents and middle-aged people because of their own psychological and physiological characteristics. Older people's needs for learning can be adjusted according to their interests, physical condition and financial circumstances (Zhao et al., 2016). For example, older people may choose to study at home using social media, in the community or at a university for older people, or in other traditional ways, depending on their physical condition (Zhao et al., 2016). Previous studies have found that older people's learning needs are characterised by the following three features: firstly, older people have a wealth of social and life experiences, they make their own choices about what to absorb and they have their own unique learning objectives. Older people prefer to devote their time to the parts that interest them, and thirdly, older people's learning requires different learning styles to be carried out (Baral, 2014).

Research related to the learning needs of older adults began to be conducted in the 1970s. McClusky (1971) summarized the needs of older adults in five areas: contribution, influence, transcendence, coping, and performance. Purdie and Boulton-Lewis (2003) argued that older adults have needs in these areas: scientific, technical and theoretical knowledge, physical well-being, playfulness and social life aspects. Peterson (1983) studied the daily life of the

elderly and found that the elderly are very interested in thinking about the meaning of life because they have a lot of free time, and he suggested that more educational institutions should be built and humanities subjects should be offered. Mortimer and Simmons (1978) conducted a survey of older adults of different ages in different regions and found that older adults have five similar needs: 1) to live longer; 2) to enjoy recreational activities; 3) to be able to reduce daily strain; 4) to participate actively in team activities; and 5) to be able to evacuate these activities safely at any time and anywhere. The needs of older adults can change at any time because of changes in age and place of residence.

Ralston (1981) conducted an empirical survey of senior centers in several regions of the United States and found that more than one hundred older participants had widely varying learning needs due to differences in race, educational level, and social status. Lamdin and Fugate (1997) conducted an empirical survey and found that older adults had the highest learning needs for singing, musical instrument, art, and dance classes. Hiemstra (1976) conducted in-depth interviews with 86 and 256 older adults over a four-year period and found that these older adults preferred practical skills, and he argued that the provision of senior programs should be oriented toward providing tools for older adults to learn to solve practical problems in the home and in life. However, another study of 786 older adults found that the majority of respondents had the highest demand for "expressive" learning (Fisher, 1986).

Older adults want to participate in education to better express themselves and strengthen their relationships with others (Fisher, 1986). Scholars have classified the needs of older learners into different categories and there is no single standard, but most of them have been influenced

by the hierarchy of needs theory. Scholars have mostly studied older adults from an individual perspective, focusing on their own growth, background, and culture, and then exploring the content of their learning needs. The results obtained by scholars in the empirical studies vary greatly, which is related to different countries and regions, different social environments, etc. The learning needs of older adults vary according to different conditions. To analyze the learning needs of older adults in a region, it is necessary to first understand the social environment, humanistic background and other basic information of the region, and the learning environment has an impact on the learning needs of older adults.

Some scholars have studied the factors that affect the learning needs of older adults. Courtenay et al. (1983) investigated the educational needs of 505 elderly people with low literacy levels and concluded that the social service system and the ability of teachers determined the learning needs of the elderly. As they enter old age, leisure and recreational activities such as travel and outdoor sports will gradually decrease, especially after the age of seventy-five, due to the reduced mobility, the elderly can only limit their activities to the home (Courtenay et al., 1983). This scholar believes that learning programs for healthy living should be established for the elderly. However, some older adults lack self-confidence in their own intelligence and believe that they are difficult to perform. Nelson (1983) investigated the elderly over 60 years old living in rural areas in the direction of learning ability and physical handicap, and concluded that transportation, social attention, and various costs can greatly affect the learning needs of the elderly. Gilmore (1980) analyzed universities in Sweden, where all universities allowed older people to enroll without age restrictions, and there was not much

difference between older people and younger students in terms of learning ability, and their past experience and cultural accumulation facilitated their learning advantage. Linking older people's education with formal education. Lowering the entrance barrier for the elderly and eliminating the age limit for university study are conducive to guaranteeing that the elderly can enter university and obtain a diploma along with younger students (Gilmore, 1980). Guaranteeing the right to fair and open education for the elderly allows them to enjoy equal rights to education and motivates them to learn (Gilmore, 1980).

Learning Style Needs of Older Adults. In the era of rapid development of educational technology and network technology, older adults also have more needs for different learning styles. Based on the fact that older groups are all involved in non-formal education, Ouyang (2019) summarized three dimensions of current academic exploration of older people's learning styles: the first dimension is the individual-centered self-directed learning style, which emphasizes that older people are capable of self-directed learning because they have rich experiences and educational resources. The second dimension is the interaction-based learning approach, which emphasizes that learning is a continuous interaction between the learner and the learning environment, including human-computer interaction, interaction with the environment and interaction with oneself, and emphasizes that older adults should change from passive recipients to active interactors with the environment, and emphasizes the transformation of the status of older adults in learning from passive to active. The third dimension is ICT-based learning, which emphasizes relying on the advantages of information and communication technology to facilitate older people (Ouyang, 2019).

Zhang (2015), in his study on the organization of senior education, concluded that face-to-face teaching, experiential learning, TV learning and online learning are ranked in decreasing order of preference. In a study on the learning needs of urban elderly in Shanghai, Li (2016) found that 81.5% of the elderly were most willing to accept "face-to-face group teaching", while only 9.5% were willing to accept "online distance learning". This shows that the most popular learning method among urban older adults in previous studies is the traditional face-to-face teaching, which is the most popular teaching method among older adults when they were students, and they have fully adapted to and accepted this teaching method. However, Hu (2021) found through a grounded research method that there is a difference in the demand for learning methods between urban and rural older adults, with rural older adults preferring to use cell phones or computers to learn in the form of short videos, and this difference in learning methods is influenced by various factors such as income, transportation, and policies.

Older Adults Learning Internet Skills

There are two main factors, internal and external reasons, for older adults to learn Internet skills. In terms of internal reasons, one study conducted a questionnaire survey on older adults around 60 years old and found that older adults around 60 years old are directly attracted by the novelty and fun of the Internet (Zheng & Xu, 2019). Cresci et al. (2012) study showed that older adults use the Internet to gather health-related knowledge, skills because of their declining health condition. If possible they use the Internet to communicate with doctors and seek solutions. Oppl and Stary (2020) explored and studied the motivation of older adults to learn Internet skills from the perspective of interactive computer games and showed that many older

adults are exposed to interactive computer games because they want to enjoy the novelty so they start learning related Internet skills. Braun (2013) found that older adults' social needs are met through a variety of different social media, and that older adults use the Internet primarily to stay in touch with loved ones and friends. There are many external reasons for older adults to learn Internet skills, including pressure and influence from the community or from the need for interpersonal interaction can trigger older adults to learn Internet skills in numbers (Li, 2020).

Kim (2010) et al. conducted an investigation and analysis of older adults' Internet skill literacy, and they concluded that Internet skill learning is a social activity and that there is a facilitative effect of living environment on learning in older age groups. Findsen's (2006) analysis is similar to Kim's (2010), who argues that the learning of Internet skills in older age groups is driven by socialization. It has been found that many older adults engage in digital skills learning with anxiety of difficulty integrating into society and some social anxiety (An, 2020). In addition, there are many older adults who engage in digital skills learning with the idea of being closer to their children (Jin & Sun, 2020).

Summarizing the literature, it can be found that the most important support for older adults to learn Internet skills is support from their children, which fits well with the needs of older adults. Children can support directly through knowledge and skill transfer. Some studies have shown that young people learn social customs and moral values from their elders, and elders learn new technologies and ideas from young people. For example, a study by Cortellesi (2016) and Rogoff (2003) found that within families, older people are responsible for passing on cultural and social customs, and younger people are responsible for passing on new and current

technologies. Scholars have noted that children with higher education often act as "filters" for online information, acting as "opinion leaders" and "gatekeepers" in the face of online rumors. They act as "opinion leaders" and "gatekeepers" in the face of online rumors, and provide support for older adults to learn safely online. Some studies have also shown that children help older adults to improve their media literacy, build awareness of online information and improve their screening skills, and help them to learn Internet technologies better (Yu, 2021). However, some researchers have found that children's help to older adults with the Internet does not have the desired effect, and that help and attention from family members can bring either positive or negative changes to older adults and families (Li, 2018).

Some studies have shown that children have a high willingness to support older adults in learning Internet technologies, but lack understanding of their learning needs and even express a lack of understanding and support for them to do so, which can discourage their confidence and enthusiasm to participate in learning (Cao & Xie, 2021). Although some children will instruct the elderly on Internet technology, the awareness of active instruction is low and the depth of teaching is not enough (Hou, 2021). Wu (2020) argues that although the improvement of older adults' Internet technology level mainly relies on their children, the children do not have sufficient time to instruct them. Negative attitudes of family members can also have a negative impact on older adults' learning. For example, some family members disapprove of older adults' use of the Internet because they believe it does not reduce the financial burden for the family. This is a big blow to older adults who want to use the Internet to access new things (Wei, 2012).

On the study of Internet skill learning and parent-child relationship, scholars have come to

different conclusions based on their findings. In a study of families with children, Wan et al. (2018) found that active parental learning of Internet skills can promote parent-child relationships. In contrast, in Li's (2018) study, it was found that parental learning of Internet skills would lead to further intensification of antagonism and disconnection in parent-child relationships. In terms of Internet skill learning and family relationships, Ji and Fan (2020) found in a study of older adults that learning Internet skills led to more common topics between the two generations and both parties were more likely to communicate on an equal level. Zheng and Xu(2019) investigated families with older adults and found that Internet skills learning by parents may bring new family relationships and new life experiences to families. In terms of Internet skills learning and older adults' family roles, Tan (2019) noted that Internet skills learning by rural parents would result in a certain degree of dissolution of parental authority in the family. An (2020) et al. also argued that Internet skills learning among older adults can lead to a gradual recognition of their children's values and acceptance of their children's new values.

According to the literature review we can find that the current research on older adults' learning is more on traditional learning methods or basic learning through Internet devices, and no scholars have studied the use of social media learning as an emerging learning method for older adults.

Informal Learning

Informal learning is still an important part of learning for older adults in rural China, and in many cases it is the only option for them. As mentioned above, many Chinese villages have difficulty providing formal learning opportunities for older adults because of economic

underdevelopment or lack of transportation. Many rural elderly people have difficulty in accessing classrooms for face-to-face learning due to low income or health problems, which makes informal learning crucial for them. Currently, many rural elderly people can use cell phones or computers to learn about their interests or learn news at home, and this form of informal learning greatly meets the learning needs of rural elderly people. We need to understand the current state of research and practice of informal learning, which can better help us analyze the learning experiences of rural older adults in China.

Informal learning is learning that arises from daily life experiences work, family or leisure, which is not structured in terms of learning objectives, length of learning and support for learning, nor is it aimed at obtaining a certificate (Council of Europe, 2023). From the learner's point of view, learning is not excluded from being intentional, but is often not, or is episodic and spontaneous (Council of Europe, 2023).

Direct research on informal learning and Adult Education did not appear in large numbers until the 1980s, but the characteristics and ideas about informal learning can be traced back to the early works on "learning" by the American adult educator Lindeman (1926) and the educational philosopher Dewey (1986). In particular, educational philosopher Dewey (1986) argues that learning occurs through personal experience, lifelong learning, and reflection. As early as the twentieth century, he pointed out that students did not just learn from the formal curriculum, but that they learned something different from it. He believed that the greatest error in pedagogy at the time was the belief by some scholars that what a person learns is only the particular thing that he is learning at the time (Dewey, 1986). Dewey (1986) introduced the

concept of "collateral learning" based on his own understanding of pedagogy, which can be said to be the origin of the study of informal learning.

In addition to Dewey, the idea of informal learning is also embedded in the philosophies of Lewin (1935), Follett (1919), Knowles (1950), etc. Follett fully recognizes the value of informal learning in forming a new democracy (Conlon, 2004). She believes that informal learning is innate, spans a person's lifetime, and can be acquired through the way one lives and in the act of teaching one to form a social consciousness (Conlon, 2004). Of course, although both Dewey and Follett encourage and value informal learning, they did not coin the term "informal learning".

UNESCO introduced "Informal Education" in the 1940s, and since then, the concept of "Informal Learning" has received widespread attention in Europe and other countries around the world (UNESCO, 1979). Since then, the concept of "Informal Learning" has received widespread attention in Europe and other countries around the world (Straka, 2004). It was not until 1950 that Knowles (1950) published his book "Informal Adult Education: A Guide for Administrators, Leaders, and Teachers". In his book, Knowles (1950) introduced the concept of informal learning for the first time and opened the curtain of informal learning research, in which Knowles (1950) proposed many learning tasks for adults that schooling could not provide, and also mentioned the term "informal learning" for the first time. The American adult educators Marsick and Watkins (1988) gradually led the way in informal learning research after the 1980s and started a worldwide trend of informal learning research.

The definition of informal learning has been considered differently by various scholars;

Coombs and Ahmed (1974) equated education with learning in their paper and proposed three concepts of formal, non-formal and informal education, while international organizations such as the European Commission, OECD and some countries have also proposed their own definitions based on their own strategies. However, there are also scholars who take a different approach to understanding.

Scholars Dale and Bell (1999) argue that learners control their own goals and how they learn in informal learning, which generally occurs in the work environment and is related to individual performance and employability, and that companies do not include it in their programs or curricula, and may be encouraged by all parties involved, but may also not support it. In the article by scholar McGivney (1999), informal learning is described as learning that takes place outside of a dedicated learning environment, arising from individual and group activities and interests, but may not be considered learning. Informal learning is a non-curricular learning activity (including discussions, presentations, information, advice and guidance) is a service provided or facilitated in response to the expressed interests and needs of people in different sectors and organizations (health, housing, social services, employment services, education and training services, guidance services). Informal learning can be planned and organized, if short courses are organized according to identified interests and needs, but in a flexible and informal manner in an informal community setting.

Like Dale and Bell (1999), McGivney (1999) emphasizes the contextual nature of informal learning, where formal learning occurs in specific settings, such as classrooms and schools, while informal learning is learning outside of formal learning settings. processes and

experiences involved in learning activities, rather than focusing solely on the context. This is because some learning activities that take place in informal settings are not fundamentally different from those that take place in the classroom. For example, a parent teaching a child to count from one to ten at home is the same as a teacher teaching a child in kindergarten.

The concept of formal versus informal learning has been controversial. Marsick (1988) proposes a new conceptual framework that places the post-industrial era on reflecting on and emphasizing informal learning. La Belle (1982) asserts that learning should not be divided into three clearly delineated, separate categories, and that the possibility of other forms of learning can be seen in any one of them. Eraut (2000), on the other hand, recognizes only two categories, formal learning and learning beyond. Eraut (2000) doubts the applicability of informal learning and therefore tries to replace informal learning with non-formal learning, but the results are not very satisfactory. So in 2004 Eraut (2004) used "informal learning" when describing workplace learning again. Whichever term is most appropriate to describe this particular form of learning, it is considered to be the most appropriate for workplace and professional learning. As Eraut (2004) emphasizes, much of the learning in the workplace itself is informal, including learning from others and learning from personal experience, both of which often co-exist.

In their report "Informality and Formality in Learning", Malcom et al. (2003) argue that learning should not be divided into formal, informal, and non-formal learning categories. It is more accurate to understand "formality" and "informality" as two characteristics that exist in all learning. The goal of research should be to identify these two characteristics in specific learning contexts, to analyze their relationship, and to identify their implications for learners, teachers,

and learning environments (Malcom et al., 2003).

In compiling the literature in related fields, I found that current research on informal learning related to the topic of this paper focuses on three research areas: value of informal learning research, mobile learning, and community learning.

Value of Informal Learning

The question of value can be understood simply as a question of meaning, and it is essential to study the value of informal learning, which occupies a large part of a person's lifetime learning time. Informal learning has important value from both micro and macro perspectives. The first is the value of informal learning for building a lifelong learning system. The second is the meaning and value of informal learning for individual learners.

Informal learning has evolved from a compensatory field in the formal learning system to a critical position in developing the ethical, humanistic, and scientific literacy of students and citizens, building innovative learning experiences, and fostering lifelong learning systems. In "Mapping the field of lifelong (formal and informal) learning and (paid and unpaid) work," Livingstone (2008) notes that both formal and informal learning are important components of lifelong learning, and they are important strategies for lifelong learning in Europe. In his book "Lifelong learning: Formal, non-formal, informal, and self-directed", Mocker (1982) argues that lifelong learning consists of four types of learning. Formal learning (where an educational organization sets the curriculum and the learner has little control over learning goals or methods), self-directed learning (where the learner has control over both learning goals and methods), non-formal learning (where the learner has control over learning goals but not learning methods),

and informal learning (where the learner has control over learning methods but not learning goals) (Mocker, 1982). Beattie (1998) state that the elements that influence organizational learning are learners' motivation for informal learning, learners' skills and knowledge about dialogue, and that informal, personal and interactive learning contributes to team building. It has been argued that informal learning plays a critical role in developing both professional skills and personal lives in the workplace in a globalized environment, but there is no theoretical model that balances the conflicting roles of individual and organizational interests.

Informal learning is important to the development of the individual learner. It is a unique way of learning for the individual in which the initiative of learning is in his or her own hands, and it attracts learning that takes place in the space around people that encompasses the workplace (Marsick & Watkins, 1997). Learners can use informal learning to get help, information or support, learn different perspectives, the ability to get feedback, consider optional ways of thinking and acting, reflect, evaluate the process of learning the outcomes of the experience, and choose where to focus their attention (Conlon, 2004). As more and more jobs become knowledge-based occupations requiring new skills, innovative techniques and approaches to informal learning will facilitate the development of knowledge management (Hrop, 2000).

Ivan (1972) suggested that most of what is known comes from outside formal educational institutions, that most of the student's learning takes place on his or her own, and that most learning occurs by chance, even if some highly planned learning is not the result of planned instruction. Some researchers would argue that workplace-based expertise is acquired through

formal training. This expertise may include classroom instructional coaching, computer training, execution of a critical task, etc. But after a summary of the literature we can find that the vast majority of learners' learning behaviors, which occur in the workplace, take place in informal practice. A similar conclusion was reached by Bell (1999), who argued that learning extends beyond the school and that informal science settings and experiences also play a key role.

Formal and informal learning is widespread across multiple fields, with informal learning in science and technology being underfunded, undervalued, and under-researched areas whose contributions to scientific research and the development of future scientists and technologists have been wrongly overlooked (Wellington, 1990). Formal and informal learning focus on different content, with formal learning focusing on cumulative and constructive knowledge, which is common across multiple fields, and learning aimed at enabling the development of science or art. But people unconsciously learn a lot of detailed, contextualized knowledge every day that is more applicable to specific contexts. This type of informal learning has often been overlooked in the past, so researchers have questioned the advantages of formal learning while pointing out the strengths and characteristics of informal learning. A more prominent example is language learning, where informal learning has surpassed even formal learning as the most important learning style (Scribner & Cole, 1973).

Informal learning also contributes to the spiritual dimension of the person. Adult learners' learning is mostly informal and episodic, and dialogic learning, guided learning, and self-directed learning are three strategies of informal learning in adults, based on which research has examined how these three factors contribute to adult spiritual development in different but

sometimes overlapping ways. In his article "Spiritual dimensions of informal learning", English (2000) discusses the importance of informal learning for the spiritual dimension of the person. He argues that all kinds of social interactions of individuals are spiritual in nature, and that informal learning is conducive to the nourishment of the spiritual dimension of individuals because they learn informally during social activities (English, 2000).

Lohman (2000) argues that informal learning is important for both individuals and collectives because individuals and collectives are interdependent, and individual learning and collective learning are mutually reinforcing; individuals can learn through communication and cooperation with the collective, and the collective learning atmosphere also influences individual learning. For example, John (2004), through a study on informal learning in the workplace, found that learners acquired 70% of knowledge through informal learning in the workplace, while only 30% of knowledge could be acquired through organizational training. The memory rate of sharing knowledge itself can reach 90%. At the same time, from the time of knowledge storage, only 10% of the knowledge acquired by individuals in learning activities with others is forgotten. Seventy percent of our learning comes from work experience, tasks and problem solving, 20 percent from frustrations encountered and role models, and 10 percent from courses and readings (John, 2004). Formal learning based in the classroom, workplace, and field is only 10 to 20 percent of our learning resources (Cross, 2003). In other words, 90% of learning is informal, while only 10% is formal learning. The above summary of the literature illustrates the important role of informal learning for the individual learner.

I chose to compile the literature on informal learning theory because in China, the

popularity of smartphones and computers is increasing and a large number of older adults no longer choose to enter the classroom for formal learning due to lack of time and physical health, but instead use their cell phones or computers to learn informally at home or in the office (Zhao & Zhao, 2017). I believe that informal learning theory helps to address the issue I raised because older Chinese people's learning is often based on cell phones or computers achieved outside the classroom, which fits well with the definition of informal learning theory.

Mobile Learning

Mobile learning is a form of learning based on modern education technology, computer technology, Internet technology and mobile communication technology. Mobile learning platforms can be social media, mobile applications, web pages, live streaming, etc. At present, there is no unified understanding of the concept or connotation of mobile learning, but mobile learning is generally regarded as a new type of learning mode after distance learning and digital learning, which is an extension and expansion of digital learning. Mobile-Learning theory is developed from distance learning and digital learning, and is one of the specific forms of digital learning that has gained new development (Sharples et al., 2005). Based on current research, mobile learning can be considered part of informal learning, which has many of the qualities of informal learning, such as the fact that mobile learning often takes place outside of formal learning settings, is not delivered with a diploma, and is often unplanned and self-directed by the learner.

Among the rich variety of informal learning approaches, there are modern learning approaches that are similar to mobile learning, such as online learning and e-learning, but

mobile learning is more "mobile" than other informal learning approaches (Wu, 2009). In other words, mobility is the fundamental mark of mobile learning that distinguishes it from other informal learning approaches. Compared with other learning methods, mobile learning is more convenient and efficient in accessing educational resources and information with the advantage of the Internet; compared with digital learning, mobile learning not only emphasizes the "mobile" characteristics of learners and learning contents, but also retains the instrumental properties of different mobile devices. Online learning and distance learning both realize the synchronous and asynchronous nature of teaching and learning interactions, but the difference is more in the device terminal and the subject of the class where the learning takes place, while mobile learning emphasizes the active learning of students and the mobility characteristics of the device (Wu, 2009). Mobile learning differs from digital learning in that learners do not have to be confined to a computer desk, the learning environment can be mobile, and teachers, students, researchers, and technicians can all be mobile (Winters, 2007). In terms of how it is implemented, the technology base for mobile learning implementation is mobile interconnection technology, and the devices that support mobile learning must be portable, non-linear, and mobile (Winters, 2007). Due to the virtualized nature of teacher-student communication, it is easier for introverted learners to overcome the fear and embarrassment of communicating with teachers in the learning process, so that they can communicate with teachers in a timely manner and are less likely to cause learning lags (Yi, 2009).

Inheriting the advantages of informal learning, mobile learning is superior in terms of portability, interactivity and richness of learning resources (Sharples et al., 2005). The Finnish

project "Telenor WAP Mobile Learning" defines mobile learning as a new way of learning using mobile devices due to increased geospatial mobility and flexible learning. Different scholars have different and similar understanding of the concept of mobile learning, but in general, mobile learning is defined as a learning style or a learning model, and with the advent of globalization, the concept of lifelong learning is gradually incorporated into the concept of mobile learning. Researcher Keegan (2002) considers mobile learning as the third stage of development of distance learning, which is characterized by the freedom to learn anytime and anywhere. Some scholars also consider mobile learning as one of the forms of digital learning, which is a form of digital learning that learners use wireless mobile communication network technology and wireless mobile communication devices to access educational information, educational resources and educational services, and realize rich interaction between teaching and learning through mobile technology in appropriate contexts, anytime and anywhere. Scholars Dye (2003) and others consider mobile learning as learning conducted anytime and anywhere through mobile computing devices that can enrich and present learning content and facilitate learning communication between teachers and students.

Although mobile learning has become an irreversible trend in current learning styles, some scholars still have some concerns about mobile learning, such as the fact that mobile learners' attention is often distracted by content on mobile devices that is not related to learning, thus distracting learners' attention; also, mobile devices generally have smaller screens, which tend to make the eyes tired, and have slower data processing speed compared to computers, and The keyboard is small and not suitable for typing a lot of information, the storage space is too small,

the wireless data transmission is unstable, the battery life is short, and the operating system is incompatible with the computer, among other disadvantages (Yi, 2009).

Several characteristics of mobile learning can be summarized from all the above definitions: digitalization of the realization method, interactivity of learning content and activities, portability of learning devices, contextualization of learning activities, and convenience of learning. Mobile learning integrates modern advanced wireless mobile technology, digital technology and Internet technology, thus realizing dynamic and intuitive learning content. This stimulates learners' enthusiasm for active participation and facilitates the effective acquisition of knowledge and skills. The most prominent advantage of mobile learning is that it uses mobile, portable devices, which allows users to be more closely connected to mobile devices and creates a flexible learning style, realizing the concept of learning according to needs, which is very much in line with the theory of self-directed learning. Learning resources in mobile learning are fast and varied, and therefore better meet the individual needs of learners. The ideal state of learning for all, all the time, and everywhere has been transformed from a vision to a reality. In the process of mobile learning, the learner's initiative and individuality are reflected to a greater extent.

The characteristics of mobile learning are highly compatible with the learning needs of rural Chinese seniors, who have difficulty sitting in a classroom at a fixed time like teenagers do, and most of their learning is informal. The application of mobile learning in the learning of rural elderly has great potential for development. It not only brings into play and consolidates the advantages of distance education, but also fully meets the individual needs of learners, is rich in

its own characteristics, and is in line with the concept of lifelong education, and is a new model to promote the development of the concept of lifelong learning. In the context of this study, mobile terminals such as smartphones and various computers have become common technological products for rural elderly people in China, and they have the hardware conditions to carry out mobile learning. With the help of emerging technological means, mobile learning provides more possibilities for Chinese elderly people's learning.

Community Learning

Villages are the basic form of organization in rural China. Different numbers of rural people in rural areas of China live together in villages, and each village is a miniature community. Community learning is an important part of learning for older people in rural China, and most of the community learning in rural China is in the form of informal learning.

Scholars Zhu and Baylen (2005) argue that community-based learning refers to learning opportunities provided in non-formal education settings in the community outside of traditional educational institutions. For one segment of community learners, community learning refers primarily to empowerment, enhancing their ability to deal with and dominate the issues that affect their lives, providing them with opportunities to improve employment and the information people need to participate in community life. For another part of community learners, community learning means programs and services provided by the community as a teaching and learning process. This process takes different approaches, programs, and services to develop the knowledge, competence, self-confidence, and skills of individuals, culminating in lifelong learning and ongoing service to the community (Zhu & Baylen, 2005). According to scholars

Falk and Harrison (1998), community learning refers to a community that, in all respects, individually and collectively, consistently improves its ability to achieve desired outcomes. In his view, community learning refers not only to the learning process but also to the learning outcomes to support individual and community development.

The current practice of community learning is diverse. Countries and regions such as Canada, the United States, Japan, and Europe are early community builders and generally attach great importance to community culture and education, and community education has become the key to their community building and is highly valued and strongly supported by the government, mainly using community centers, squares, exhibition halls, libraries, coffee houses, concert halls, and other community venues in combination with the The main use of community centers, plazas, exhibition halls, libraries, cafes, music halls, and other community venues combined with community infrastructure and community organizations to provide education and improve the quality of community members (Ogden, 2010).

For example, in the United States, community learning was organized in the early 1950s through the establishment of community colleges, a form of community learning that was open to all community residents regardless of age, gender, or occupation (Cohen et al., 2013). Community colleges can organize community learning according to the different learning needs of residents, such as educating people of different ages and genders in a variety of part-time courses, including helping new immigrants improve their language skills, offering a variety of training courses such as music, painting, health care, home economics, and tutoring knowledge, and training certain vocational skills and job applications (Cohen et al., 2013). Such forms of

community-based learning are more flexible and diverse in terms of instruction, ranging from education through media such as television and radio, to activities conducted outside of school. Residents chose the various programs offered in the community not to obtain a certain academic degree, but to learn an activity skill, improve reading skills, improve home economics skills, promote personal literacy and interpersonal skills, and increase employment opportunities (Cohen et al., 2013).

After the 1980s, the focus of community education shifted back to continuing education for adults, vocational education, and developmental education. To this day, community education continues to be an important educational vehicle in the United States, and community education plays a more important educational role than traditional education.

Researchers in China have found that the current community education for the elderly in China is still in the area of meeting the needs of the elderly in terms of leisure and recreation, cultivation and passing time (Chen et al., 2021). Researchers investigated and studied the education supply of Ningbo senior college and found that the staff of Chinese urban community education had a one-sided understanding of the learning needs of the elderly, and that recreational courses accounted for a large proportion, with "painting, singing, and dancing" being understood as the entirety of community education (Hu, 2011). In a study of a community school for the elderly in Shanghai, Li (2016) found that the school offered permanent courses, mainly recreational courses and foreign language courses, etc. In the study of community education in rural areas, researchers found that rural community education has deficiencies such as inadequate policy support, lack of educational resources, lack of funding sources, and a single

operating mechanism (Yao, 2013).

From the above analysis of community learning theory and practice, community learning is characterized by the following elements:

Universality of Learning Subjects. Every citizen in the community, regardless of race, religion, class, occupation, age, gender, etc., can be the target of community learning.

Certainty of Learning Place. Community learning is a learning activity that relies on the community or occurs in a community context. Since regions differ in terms of geographic location, resources, level of economic and social development, and quality of community members, the implementation of community learning takes on different characteristics from its inception, reflecting the characteristics of the region.

Comprehensiveness of Learning Content. The content of community learning includes all aspects of residents' lives, i.e., it involves life skills, cultural knowledge, moral cultivation, scientific literacy.

Diversity of Learning Forms. It is rich and diverse, including both organized and planned teaching arrangements by community education institutions, and informal learning activities by community learners on their own initiative.

We can find that "community" is the main characteristic of community learning, and it is the most important attribute that distinguishes it from other forms of learning. "Community-based" is embodied in "for the development of the community" and "relying on the community", and its purpose is to promote the development of the community and its members, and its process is supported by the community in the community context. The process is carried out in the

community context with the support of the community, and various community education institutions are the main places for community learning.

Self-Directed Learning

In modern society, self-directed learning has become an important part of learning. Because of its importance, self-directed learning has been one of the most active areas of inquiry in adult education and lifelong learning research for decades since it was first introduced (Parker & Roessger, 2020). Since 1987, an international symposium has been held annually to share the latest advances in the theory, research and practice of self-directed learning, and in 2002, the journal "International Journal of Self-Directed Learning" was launched (Hiemstra & Brockett, 2012). Research in the field of self-directed learning has been enriched by many scholars who have explored the nature of self-directed learning, the personal characteristics of learners, and the learning process.

The Nature of Self-Directed Learning

The field of adult learning research has witnessed a surge of research on the theory of self-directed learning after it was first proposed. The educator Tough (1966) proposed a theory of self-directed learning, which he explained as self-directed instruction in which the learner develops a learning plan and directs learning activities, and later illustrated the importance of self-directed learning in adult learning through numerous experiments and studies. Knowles (1975) saw it as a core element of andragogy. In his theoretical assumptions, self-direction is a distinct adult phenomenon that distinguishes children. This simple distinction has attracted criticism from numerous scholars. In response, Knowles (2002) reconceptualized self-direction

as a continuum from dependence to independence, with the degree of learner dependence or independence determined by the specific learning situation. Knowles (2002) sees self-directed learning as the process by which individuals, with or without the assistance of others, diagnose their learning needs, identify learning goals, locate learning resources, select and implement appropriate learning strategies, and evaluate learning outcomes. This reveals an important characteristic of self-directed learning: it is not all-or-nothing, but fluctuates dynamically with the state of the learner or situation.

Both Tough (1966) and Knowles (2002) take a processual view when defining self-directed learning. In contrast, from an individual developmental perspective, Bolhuis (1996) and Garrison (1997) argue that the manager and the person responsible for learning in the process of self-directed learning is the student himself, and that self-management and self-monitoring are integrated in self-directed learning. Brockett and Hiemstra (2018) combine the process theoretical perspective with the individual self-developmental perspective together, arguing that self-directed learning consists of two distinct but interrelated dimensions, the first of which refers to the learner's primary responsibility for planning, implementing, and evaluating the learning process, and the second of which refers to the learner's willingness to take on learning as an element of individual development. Merriam (2001) argues that self-directed learning is a unique way of learning for adult learners and that self-directed learning can effectively distinguish between adults and children. Self-directed learning is one of the most dominant and common forms of learning in the daily life of adults, and the fact that the subject of learning is in the hands of the learner is the most essential characteristic of this form of learning. In the whole

learning process, learners can make their own learning plan, choose their own learning time, set their own learning pace, and control the learning process.

Knowles (1975) made five assumptions about self-directed learning: 1) As individuals mature, their personalities change from dependent to independent, and they become capable of self-directed growth; 2) the individual learner's accumulated experience can be transformed into rich learning resources; 3) the readiness of the individual to learn - learning due to the need for social role development tasks; 4) learning activities are mostly "task and problem" oriented; 5) motivation for learning comes from intrinsic incentives, such as curiosity and the need for self-actualization.

Referring to Knowles' (1975) five prerequisite assumptions about self-directed learning, in the context of the Chinese rural elderly group: this group already has an independent type of personality, and their personal will is the prerequisite and standard for their actions; Chinese elderly people have mostly accumulated rich experiences in their work and life, and these experiences and experiences can be the source and reserve of their learning resources; Chinese elderly people Chinese older adults usually encounter a large number of problems in their work and life adaptation, and their learning needs are mostly oriented to the completion of the current task, and change with the change of the situation. Thus, the self-directed learning approach is suitable for Chinese older adults. When they encounter problems, they can use the new media to conduct instant searches, choose the content and methods of learning on their own, and use the information directly to solve their problems.

Personal Qualities of Self-Directed Learners

Following the behaviorist research of the early 20th century, which focused on the information processing of learners, the individual learner became the focus of adult learning theory. After the 1950s and 1960s, along with the rise of humanism, individuality and the development of self-potential were emphasized, and there was a growing interest in how learning can make adults more independent (Merriam, 2011). Self-directed learning quickly became a major area of adult learning research due to its unique attributes.

Self-directed learning research in this period focused on the personality characteristics and learning behaviors of adult learners, such as the learning contract proposed by Knowles (1975) and the SDLRs scale developed by Guglielmino (1977), among others. In their studies, self-directed adult learners are fond of learning, have high curiosity, can show initiative, independence, self-discipline and persistence in the learning process, and are willing to see problems as challenges and take the initiative to take responsibility for learning. To date, many scholars continue to focus on the personal attributes of learners, often using the Self-Directed Readiness to Learn Scale to conduct correlational research, with fruitful results. However, such research treats learners as completely independent individuals who are free from environmental interference and ignores the influence of the learning environment on learners. In their studies, scholars such as Hodkinson et al. (2007) analyzed the influence of the learning environment on learners, arguing that learning develops from the accumulation of experiences in family, school, workplace, and other community life, and that as learners enter new stages, their dispositions and identities are not entirely new, but are in a dynamic balance of continuity and change.

The Impact of Self-Directed Learning and The Learning Process

There are two main research directions on the influence of self-directed learning. First, some researchers have used questionnaires to understand the readiness of self-directed learning and the status of the dependent variable, and analyzed the effect of self-directed learning readiness on the dependent variable. For example, Lai (2011) investigated the effects of Self-Directed Learning Readiness (SDLR) and Internet literacy on the effectiveness of online learning using Taiwanese civil servants as the study participants. The findings indicated that civil servants' SDLR and web literacy were positive. SDLR was a significant predictor of civil servants' online learning effectiveness, and SDLR was also the most important factor in determining the success of online learning among civil servants in Taiwan (Lai, 2011). Regarding the study of variables such as self-directed learning readiness, researchers tend to construct structural equation modelling (SEM) to analyze the relationship between variables. For example, Chu and Tsai (2009) developed a theoretical model to explain the factors that influence adult learners' preferences for Internet-based learning environments. The researcher collected data from 541 individual participants from various educational institutions in Taiwan for data analysis. The analysis revealed that Internet self-efficacy (ISE) mediated the relationship between Internet use and participants' preferences, and that self-directed learning readiness played a significant role in predicting adults' preferences for learning environments, especially for higher levels of intellectual challenge, compared to ISE. Second, some researchers have explored the effects of students' adoption of self-directed learning approaches in learning a particular course on course learning outcomes, or have used comparative studies to compare

self-directed learning approaches with instructor-directed learning approaches. For example, Boyd and Ellis (2007) analyzed the effectiveness of students' application of self-directed learning approaches to learning certain courses. The self-directed learning approach allows students to decide and develop a semester-long project in an independent way, including defining their own grading rubrics and assessing learning outcomes (Boyd & Ellis, 2007). The results indicate that the use of the self-directed learning approach in course learning not only develops students' independent learning skills, but also students' satisfaction with the learning outcomes of the course is higher (Boyd & Ellis, 2007).

In the 1980s, learning contexts began to receive attention in the field of self-directed learning, which meant that the focus of self-directed learning research gradually shifted from the individual learner to the learner in context, and researchers began to study the process of self-directed learning. Scholars recognize that while each learner's learning process is always personal and unique, their understanding of the meaning of learning is determined by their unique experiences of themselves and the world since their birth, and that self-directed learning is not only a tool for learning, but also a process and result of the interaction of the learner's psyche with culture and the realities of their lives (Morris, 2019).

Brookfield (1993) argues that self-directed learning implies that learners can choose the various resources needed to carry out their learning based on their own decisions, but the reality that there are always more or less barriers to accessing resources also constitutes a structural barrier that highlights the shortcomings of self-directed learning. Spear and Mocker (1984) found that self-directed learning projects are driven by life environment, which may be positive

or negative, may occur in the learner personally or in those who influence him, or may be events that simply occur and are observed in the physical and psychological environment in which he lives. In terms of specific learning processes, Andruske (2003) studied the transition of women on welfare policies to work status through self-directed learning and found that these women acted as political agents for themselves and other women, achieving self-ownership through critical reflection and learning in five areas: welfare policy rights, education and training, employment and work skills, and becoming community change agents.

We can find that the learning environment has an important influence on the process of self-directed learning, not only in terms of the physical location of the learner, but also in terms of the socio-cultural location in which he or she is located. This suggests that this study should not only focus on the description of specific learning behaviors such as planning, monitoring, and assessment, but also on their interaction with various contexts.

In conclusion, with the joint efforts of many scholars, the knowledge map of self-directed learning has gradually grown and achieved a deeper development from descriptive research to analytical and applied research. Throughout the decades of research, in addition to the early days when qualitative research methods were mostly used, subsequent studies have relied more on quantitative research, such as questionnaire and experimental methods. The depth and breadth of self-directed learning have not been fully explored due to the popularity of such quantitative research methods, and the deeper roots of learners' self-directed learning, their individualized learning journey, and the socio-cultural context of learning have been somewhat neglected. Therefore, this study decided to adopt a qualitative research approach to analyze the learning

experiences of older adults in rural China.

Self-Directed Learning Among Older Adults

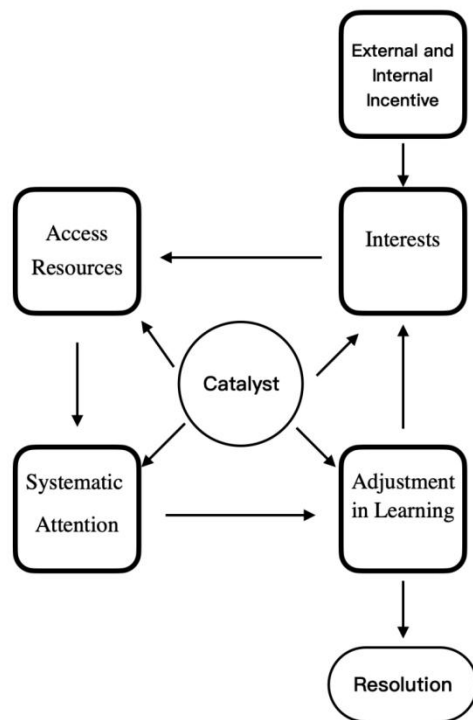
Since older adults in rural China belong to a subgroup of older adults, I provide a review of research related to self-directed learning among older adults. In previous studies, many scholars have explored the relationship between older adults' self-directed learning and other variables, paying particular attention to the relationship between older adults' self-directed learning and life satisfaction, but research on older adults' self-directed learning processes is lacking (Morrison, 2019). Brockett (1985) investigated 64 older adults' readiness for self-directed learning and life satisfaction and found a positive correlation between the two and that their readiness for self-directed learning was not related to biological age, but rather to prior educational experiences.

Adapting to changes in later life is a must for older adults, and Roberson (2005) argues that self-directed learning is an integral and central process for older adults to adapt to change. Changes in older age such as interacting better with the next generation, coping with physical deterioration and negative psychology, losing a partner or friend, and seeking the importance of one's own existence all induce the need for adaptive self-directed learning in older adults (Roberson, 2005). Computers, libraries, senior centers, travel, and newspapers are often the means or methods they use for self-directed learning (Roberson, 2005). Similarly, Roberson and Merriam (2005) found that the self-directed learning process of rural older adults aged 75-87 years was often motivated by coping with changes in later life, and they proposed a process model of self-directed learning for rural older adults based on the analysis of interview data

(Figure 1). In this regard, interest is the starting point of their self-directed learning, triggered by internal and external changes (mainly involving three aspects: more time, family changes, and loss of physical and social identity), which drives their resource acquisition and integration behaviors for problem solving; there are usually catalysts in the learning process, which are often related to their later life experiences and can be others or key events.

Figure 1

The Process of Self-Directed Learning



Note. From “The self-directed learning process of older, rural adults”. *Adult education quarterly*, 55(4), P.275, by Roberson & Merriam, 2005.

Morrison and McCutcheon (2019) explored the process of older adults' use of Internet and social media tools to create and maintain online personal learning networks, examining the

self-directed knowledge acquisition, personal transformation, meaning-making, and their role in promoting healthy aging in the practice of lifelong learning. In addition to the process, some scholars have also explored the factors influencing older adults' learning. They concluded that the influencing factors are complex and multidimensional, mainly including individual factors of older adults (gender, education level, age, health status, etc.), family factors, cultural factors, and socioeconomic factors, and there are also dynamic links between the factors and the factors.

Current research has conducted quantitative or qualitative studies on older adults' self-directed learning from different perspectives, and the results are quite fruitful, but there are also certain problems. Most studies on self-directed learning in older adults have focused on universality, ignoring the specificity of many older subgroups; and too much emphasis has been placed on the role of the individual learner in self-directed learning, resulting in the neglect of relevant external contextual factors, which is what this study needs to focus on.

Social Media

In terms of the development process of social media (Table 1), the origin of social media was in the 1970s, when BBS, Usenet and ARPANET systems emerged; the rapid development of social media began in the 1990s, when the development of computer technology and Internet technology provided key technical support for social media, and Blogs had a strong influence in the late 1990s (Bruns, 2017). The birth of SixDegrees.com, the first social media website, triggered scholars to explore the "six degrees of segmentation theory": the possibility that members of modern socialized human beings are connected by six degrees of segmentation, and that there is no such thing as an absolutely unconnected two (Shu & Chuang, 2011). Later, the

"distributed collaboration" phase, represented by Wikipedia, and especially by 2004, when websites such as Flickr and YouTube were introduced, made the concept of "user-generated content" more popular (Snelson, 2011). In 2009, social media, represented by Twitter and Facebook, flourished and the academic community began to analyze the "small world of users" (Nadkarni & Hofmann, 2012). Social media has gradually developed into a media force to be reckoned with in WEB 2.0.

Table 1

Representative Social Media Creation Time

Social Media	Creation Time
Blog	Founded in June 1993, named Blog in 1999
QQ	February 1999
WIKI	January 2001
MySpace	August 2003
<u>Fliker</u>	February 2004
Facebook	February 2004
Dig	December 2004
YouTube	February 2005
Twitter	March 2006
<u>Weibo</u>	August 2009
<u>WeChat</u>	January 2011
<u>Tiktok</u>	September 2016

Note. Data for Table 1 from Wikipedia.

Chinese social media were mainly imitated by American social media in the early days, but later on, they continued to make localized improvements and even creative breakthroughs in

their functions to suit the development trend of the Chinese Internet, forming different user habits and having stage development characteristics.

Social Media Origination Period (1994-2003). The period of social media origins in China was characterized by a focus on content. Social media in China originated when users' interests and hobbies formed online forums and online groups, which were mainly used to express opinions and exchange discussions. With the rise of instant messaging software such as QQ, online social networking began to emerge (Tai, 2022). The establishment of the DianPin (a popular review website) promoted the emergence of various review sites, which became a platform for users to share their life experiences by combining online reviews with offline life scenarios. At this stage, the information producers of social media are still mainly professionals and organizations in various fields, and users are developing the habit of socializing online. Chinese researchers are still in the initial stage of research on social media, focusing mainly on the technical level of the network, without studying other aspects of social media in depth.

Social media development period (2004-2007). The period of social media development in China was characterized by a focus on interaction between content. Social media forms such as blogs, graphic combinations, video sharing, and quizzes reflect the characteristics of social media at this stage in terms of both personal space presentation and public space collaboration - user-generated content (Mayfield, 2008). Social media such as QQ, video sharing sites, and blogs have accumulated a large number of users because of their easy-to-use and personalized interfaces, and the open sharing model provides the general public with unparalleled opportunities to freely share information in traditional media (Tai, 2022). The interactive

question-and-answer session built a bridge between information seekers and information providers, and promoted knowledge flow and sharing with the full play of users' creativity (Kaplan & Haenlein, 2010). Research on social applications at this stage focused on users' willingness to use social media and the genesis of user-generated content.

Social Media Formation Period (2008-2010). In this period China's social media has taken shape, focusing on the interaction between users. As the social media interaction model of attracting peers with knowledge content is increasingly unable to meet users' needs in terms of content quality and authenticity, the acquaintance socialization and real socialization represented by Facebook show the strong interactive characteristics of social media in the WEB 2.0 era (Conole & Alevizou, 2010). The flow of information has shifted from one-way, one-to-one or one-to-many relationships to two-way, many-to-many relationships. The creation of social media such as Kaixin and Renren has rapidly captured market share, developing new social relationships using existing real interpersonal relationships and combining online and offline relationships to develop complex cross-connections. Microblogs can satisfy users' needs for self-expression and self-representation, and can also bring about great synergy between weak and strong relationships in information exchange and information dissemination through one-way and two-way followings (Zhang & Pentina, 2012). The research on social applications has gradually begun to focus on the combination of online and offline social capital and the exploration and guidance of users' information exchange activities.

Social Media Transformation Period (2011-Present). This period is characterized by a shift in the focus of social media development to mobile communication devices. During the change

period, social media was not satisfied with providing basic platform services and introduced several novel types of services to attract users. Mobile social tools, represented by WeChat, became the new favorite in the market, and traditional social media platforms shifted from computer to mobile (Montag et al., 2018). Mobile social media can make full use of the person-to-person and person-to-person relationships in mobile networks, further enhancing the features of social applications such as sharing, interaction, and user participation in content generation (McQuiggan et al., 2015). The cross-terminal nature and portability of the combination of social media and mobile communication devices have greatly increased the usage and stickiness of users (Zydney & Warner, 2016). The enthusiasm of academic research at this stage was unprecedented, and the types of mobile social media were diversified and increasingly rapidly changing in functionality. Scholars have explored complex user information behaviors from a variety of research points, including platform type, system adoption and sustained use, information quality, and information security.

Definition of Social Media

The definition of social media originates from Social Network Site (SNS), and most scholars believe that the definition of social media comes from "What is Social Media" by Mayfield (2008), who believes that social media is a new type of online media that gives users great space for participation, openness, communication, dialogue, community, and connectivity.

In the process of parsing the concept of social media, researchers have paid relative attention to its interactive features on the one hand, and Hammond et al. (2018) explained social media as a platform that enables users to create and share content, i.e., users themselves create

and publish content, which is an important characteristic that social media must have. Social media are tools that support interaction, communication, and collaboration by storing and displaying audio and video media, as well as creating customizable profile pages that support the creation and maintenance of a personal presence in an online learning environment (LeNoue et al., 2011).

According to American scholars Kaplan and Haenlein (2010), online social media is an Internet-based application that is based on Web 2.0 ideologies and technologies and allows users to create, comment on, and exchange self-generated content, and these new technologies can effectively support users to create, communicate, and share information in a friendly and harmonious online environment. Social media relies on mobile internet technologies to create highly interactive platforms where online communities and individuals from different domains can share, discuss, collaborate, or modify user-generated content based on Internet platforms (Kietzmann et al., 2011). Researchers such as Lim and Ahn(2021) suggest that social media draws on continuous communicative interaction to share and disseminate information.

On the other hand, there is a greater emphasis on the role played by content in social media. Peng (2016) proposes that the characteristics of social media itself can be divided into the following two points: firstly, the organic connection between content creation and socialization; and secondly, the fact that users become the main players rather than operators in social media.

Some scholars have classified and defined social media according to their different uses, such as YouTube, Facebook, Flickr, and Twitter (Kaplan & Haenlein, 2010). Although the definitions of social media differ slightly, they all agree on the two main characteristics of social

media: "consumers of information are producers" and "users create content". Compared with traditional media, social media breaks the "one-to-many" communication model, and users use online services in a participatory and collaborative manner. Social media is a product of the interconnection of personal information space and public information space, and the use of social media has contributed to the transformation of the way people communicate, collaborate, create information and consume.

American scholars Alavi and Kane (2014) compared the differences between online social networking and traditional offline social networking, analyzed in depth the important role of online platforms in online social networking in the Internet era, and selected representative social media to explain the functions of social media, the needs of online users for communication and expression, and the all-round and multi-purpose use of online social media. In addition, he selects representative social media and explains why social media need to be updated and refined in a timely manner, and finally puts forward his predictions and suggestions on the future development of online social media.

Taking the social media platform OSNEM as an example, Italian scholar Arnaboldi (2017) et al. argue that OSNEM is one of the most impactful social media platforms in the past 15 years, and as the global community is becoming increasingly interdependent, users can not only access the social networking services provided by the OSNEM website, but also enjoy the novel socially oriented services and applications developed through OSNEM, but also as an underlying online social networking structure that provides technical support. This is the general direction in which all social media platforms are currently developing, providing not only basic

services but also novel additional services through the development of additional platforms. In the paper, Arnaboldi et al. (2017) analyze the convenience and impact of the integration between the physical online world and the online world in people's lives through the OSNEM platform for users to socialize online, and proposes a perfect technical solutions to facilitate the design and optimization of OSNEM functions.

American scholars France Bélanger and Crossler (2011) analyzed the control and impact of online social media on the public's personal information security issues in the development process. Information privacy refers to the important data that individuals wish to own or possess. Research on information privacy is mostly found in the traditional media field, with fewer studies of specialized technical nature; there are many studies on theoretical explanations and development predictions of information privacy, while there are few relevant studies on specific initiatives to deal with information privacy (Bélanger & Crossler, 2011). Therefore, Bélanger and Crossler (2011) hope to analyze and study the information privacy issues that have become increasingly prominent along with the development of the Web, to find the causes of uncontrolled information security, and to propose specific strategies and solutions for dealing with Web technologies.

Although the interpretation of social media varies from different concepts and cases in different perspectives, they all involve the same three elements: interaction, content and relationship, so the social media targeted in this study can be explained as follows: a platform for content creation, exchange and information sharing built from the user relationship chain with the help of modern information technology, which involves instant communication

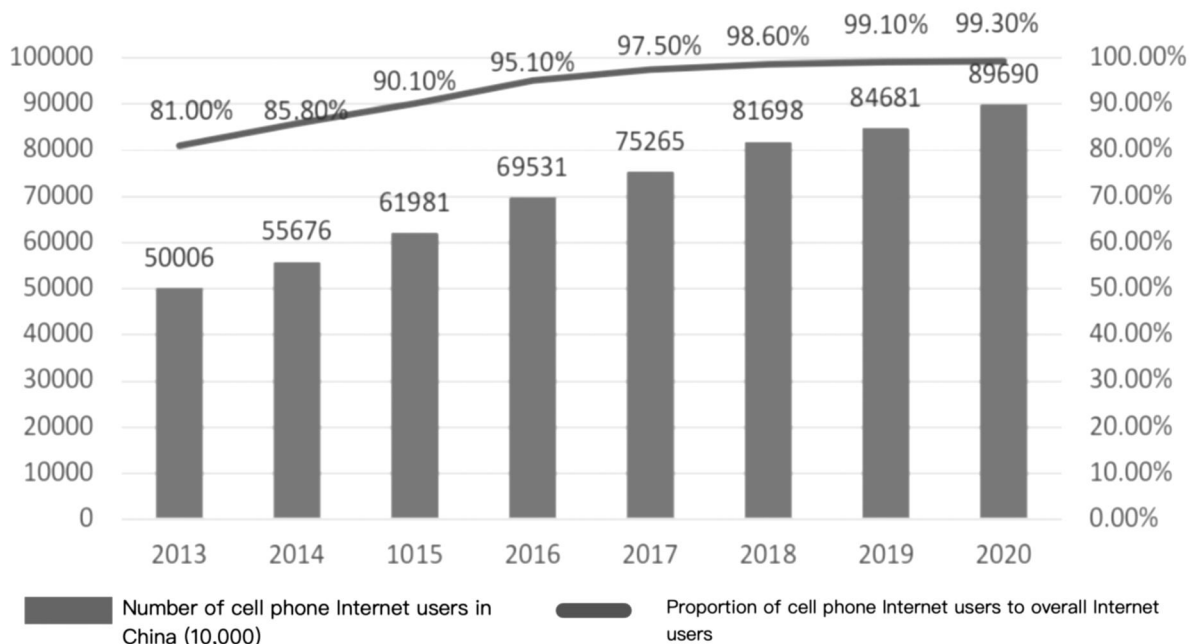
software such as Facebook, Tiktok, QQ, WeChat, Weibo and other diversified platforms with community as the model from a broad perspective.

Internet and Social Media Users in China

According to the 50th Statistical Report on the Development of China's Internet by China Internet Network Information Center (CNNIC), as of June 2022, China has 1.051 billion Internet users, with a penetration rate of 74.4%, and 847 million cell phone users, with 99.6% of Internet users accessing the Internet through cell phones, and the Internet The Internet is penetrating into the daily life of Chinese people at a very fast speed, as shown in Figure 2 (CNNIC, 2022).

Figure 2

The Size of China's Cell Phone Internet Users and the Proportion of Overall Internet Users



Note. Data from China Internet Development Statistics Report, by CNNIC, 2022.

(http://www.gov.cn/xinwen/2022-09/01/content_5707695.htm)

In China's rural areas, Internet penetration is also very high, with 96 percent of villages connected to wired Internet and 95 percent coverage of 4G Internet, making it very easy for China's rural residents to use the Internet at a low cost (People's Daily, 2018). In China, a large number of older people learn through social media, among which social media such as Weibo and WeChat are increasingly becoming the main way to obtain and publish information in people's lives (Li, 2020). However, in such an era of rapid development of the Internet and social media, older people in rural areas, who are disadvantaged in the composition of all Internet users, are increasingly marginalized (Yu, 2021).

At the same time, for the sake of commercial interests, the current development of social media is oriented to the needs of the main groups of Internet users, favoring the interests and hobbies of young people and mostly automatically ignoring the learning needs of older people over 60 years old (Yu, 2021). Older adults have become the outcasts of the Internet era, especially in the current information society where new media are rapidly developing new technologies, and this phenomenon is of greater concern. There is extensive academic discussion on how social media is used by students in learning, but few studies have focused on the use of social media for learning by older adults in rural China, or what social media older adults in rural China use for learning, and what the current situation they face in learning is. Therefore, the focus of this study is on the use of social media as a learning tool by older adults in rural China.

Social Media and Adult Learning

Based on the above we can see that when social media was created it was only used as a

tool for communication and not for learning. But after many years of development, many features of social media can now be used for learning and also many learners try to use social media for learning. In recent years, there has been a growing body of research surrounding the integration of social media and adult education. Social media is considered a new approach to adult learning that supports instructional change and overcomes the financial and time implications that many adult learners need to consider (Lutz, 2022). In the field of adult learning research, Knowles (1984) proposed many core assumptions about adult learning. These assumptions include: adult learners are self-directed, adults bring their experiences to the learning environment, adults enter the learning environment to learn, adult learners are problem-oriented, and adult motivation to learn is determined by internal factors. Social software accommodates the hypotheses proposed by Knowles more effectively than earlier e-learning technologies.

LeNoue et al. (2011) examined the relationship between social software and adult education and concluded that through the use of interactive methods and multimedia materials, social software provides educators with more ways to engage learners than any previous educational technology. Appropriate use of Web 2.0 technologies and social media can facilitate adult transformation and lifelong learning. This underscores the importance of combining social media and adult education. In contrast to earlier e-learning technologies, social media can support interactive learning environments, and it can be a primary source of virtual information sharing used to support different modes of collaborative learning. Participants can freely share their ideas on social media (Taherizadeh, 2021). The Taherizadeh (2021) study concluded that

participants perceived social media to be almost essential for collaboration. In this context, collaboration means that participants can use social media and accompanying software tools to discuss and explore an issue together without meeting in person. Social media can also facilitate the development of self-directed learning, with Lutz's (2022) study showing that up to 80% of informal learning actions demonstrate intentionality and awareness, indicating that self-directed learning is occurring.

Adult learners who participate in social media learning environments are not only seeking resources for online instruction, but they are also actively engaging with other professionals for mental health support and to alleviate stress and anxiety. But social media has not only positive but also negative effects on adult learning. Klomsri et al. (2013) investigated the patterns of Facebook use among young, poorly educated South African adults and found that self-directed learning and intrinsic motivation promoted ongoing discovery of new knowledge, but a lack of critical attitudes toward information in social networks diminished the social media use in adult learning benefits in adult learning. Nong (2020) analyzed the impact of social media on Chinese workers' learning behaviors reaching similar conclusions that social media awakened intrinsic motivation in workers and provided them with information and emotional support, but also produced negative effects such as information redundancy.

Adult learners are using social media to go online and self-direct their learning. Some are looking for resources. Some are following people who are looking for new ideas. Some are seeking support in times of uncertainty, and some are sharing their ideas and resources to support others and expand a broad base of academic knowledge. But no scholar has focused on

the impact of social media on the learning of older adults, who are also users of social media and should receive the same attention. Further research is needed to better understand how older adults learn using social media and why they learn in a social media environment.

Summary

For this study, rural Chinese older adults' learning, informal learning, self-directed learning, and social media are four important components that are inseparable and together form the behavior of rural Chinese older adults' use of social media as a learning tool. Among them, the current situation in China and the learning behaviors of Chinese older adults are the background of rural older adults' use of social media as a learning tool, and the various learning behaviors of Chinese rural older adults are influenced by the rural infrastructural conditions and rural interpersonal relationships. Informal learning and self-directed learning are the learning styles of rural older adults who use social media as a learning tool, and social media is a learning tool for rural older adults. In the next chapter, I will state the research questions and specific research design of this study.

Chapter 3: Research Design

The purpose of this thesis is to understand the learning experiences of older Chinese rural learners who use social media as a learning tool. The goal of this research is to obtain the learning experiences of older Chinese rural learners who use social media as a learning tool, so open-ended and non-directed research questions are more conducive to accomplishing the research objectives of this research. The purpose of this chapter is to describe how the research design of this study that allowed me to answer my research questions. The specific research questions are as follows:

1. How do older Chinese learners use Social Media tools for learning?
2. What benefits do older learners in rural China perceive when using social media as a learning tool?
3. What challenges do older learners in rural China face when using social media as a learning tool?

The chapter explores the use of qualitative research methods to understand the benefits and challenges these rural Chinese older learners face in using social media as a learning tool in their daily learning. I will explain the process of undertaking this qualitative study, which includes the following elements, (a) methodology, (b) participant location and recruitment, (c) participant selection, (d) sampling method, (e) data collection method, (f) data analysis method, (g) ethics considerations, (h) establishing trustworthiness, (i) limitations, (j) delimitations and (k) assumptions.

Methodology

This research uses a qualitative research methodology. The qualitative methodology refers

to a collection of methods in which researchers examine, judge, and reflect on the nature, characteristics, and other "qualitative" aspects of the research object in a holistic manner through observation, interview, and survey, in order to form a rational understanding to reveal the patterns (Patton, 2005). Strictly speaking, qualitative analysis is not a specific method, but a set of interdisciplinary, interprofessional, interdisciplinary, interdisciplinary, interdisciplinary and inter-topic research methods (Patton, 2005). It aims to analyze the causality, correlation, difference, and specificity within things and between things (Patton, 2005).

The qualitative analysis method relies on subjective factors such as knowledge, experience, and logic of the researcher, while its analytical data and results presentation have certain objective characteristics. A qualitative methodology helps reconcile various tensions. First, the ability to combine a subjective and objective view of the phenomenon under investigation (Ratner, 2002). The subjectivity of qualitative research methods is reflected in the fact that the subjective factors of researchers directly affect the process and results of qualitative analysis, such as the subject's personal preferences, research habits, thinking patterns, and values, which determine the selection of materials, tools, and the selection and application of specific methods for qualitative analysis, while the formation and application of qualitative analysis results depend on the professionalism and analytical ability of researchers (Munhall, 1988). Objectivity is reflected in the fact that the object, whether it is a person or a thing, is objective, and its development process itself is objective; and the supporting materials used for qualitative analysis are also objective (Ratner, 2002).

Second, the possibility of combining knowledge and experience. Knowledge is reflected in

the level of the subject's professional knowledge, methodological skills, learning ability and other comprehensive qualities, which determine whether the qualitative analysis process can be carried out in a scientific and rational direction, and directly affect the objectivity of the analysis results (Liamputtong & Ezzy, 2005). The experience is reflected in the fact that the researcher has to go deeper into the environment of the object to get a more comprehensive understanding of the situation. The choice of timing and mode of entry, the choice of data collection methods, and the use of research techniques all place high demands on the level of practical experience and operational skills of the researcher (Becker, 2009).

In many studies on the use of social media as a learning tool, quantitative research methods were used, of which the questionnaire is the most widely used method. For example, in their article "Social media networks as a learning tool", Kolokytha et al. (2015) used questionnaires to collect primary information and analyze the relationship between different types of Web 2.0 applications, and Moghavvemi et al. (2018) used questionnaires to collect data from 321 students to explore the patterns and purposes of YouTube use among college students. That is, the questionnaire method in which researchers design questionnaires in advance to collect information about personal situations, knowledge levels, opinions and suggestions, and process the data results according to the purpose and topic of the study (Gillham, 2008). The questionnaire method has the advantages of relative standardization, popularization, convenient statistical analysis, low cost, and high applicability. However, the primary disadvantage is that the responses are easily restricted and it is not easy to understand the respondents' situation in depth (Gillham, 2008).

The widely used quantitative research method is not conducive to answering the question I pose, which is “How do older Chinese learners use social media tools for learning?”. Using a qualitative research methodology is much more effective in answering my research questions. Because using the qualitative research methodology, I was able to talk to each respondent in more depth, which allowed me to get the data I wanted from each respondent's experience and allowed me to understand the perceptions of older people in rural China on the issue, which was very helpful in answering the questions I asked.

The choice of qualitative research methodology was also decided based on the characteristics of the Chinese rural elderly. Yao's (2022) survey showed that compared to other respondents, rural Chinese older adults were less likely to understand the structured quantitative questionnaire to the extent that the surveyor might need to explain the meaning of the questions. The main reason for this situation is the underdeveloped educational resources in rural China, with many towns having only one junior high school and a large rural population unable to enter junior high or high school. This results in many older adults only having the ability to read and write and are unable to understand complex questionnaires. Second, Chinese older adults are more receptive to qualitative research. Some studies have shown that Chinese older adults are more willing to talk compared to other respondents (Zhou, 2018). This characteristic is determined by the post-retirement status of life in China, as many Chinese older adults are responsible for taking care of their grandchildren at home after retirement, and they rarely have the opportunity to develop their own hobbies, and taking care of their grandchildren "full-time" for a long time also makes them bored, which makes many Chinese older adults eager to have

someone to talk to. This makes many Chinese seniors want to have someone to talk to. The fact that Chinese older adults prefer to talk can help the semi-structured interviews to run smoothly and to obtain more information. Finally, according to Folstein et al. (1985), older adults generally have lower cognitive levels compared to younger adults, which may hinder the completion of quantitative questionnaires. From these two reasons, it can be found that the feasibility of quantitative research is very low for older people in rural China. If a quantitative study is chosen, it is likely to result in difficulties in quantitative data collection and low data reliability and validity, which may cause serious obstacles to answering the questions I have asked.

Advantages and Disadvantages of Qualitative Research

No research methodology is perfect, and one must choose to use the most suitable method for the research problem according to the needs of the actual situation (Kothari, 2004). The qualitative analysis methodology has both its outstanding advantages and certain shortcomings in solving different problems in different fields.

The main advantage of the qualitative analysis method is that its implementation focuses on the experiential understanding of the researcher in the field, through observation, interviews, physical collection, and other methods, to get first-hand analysis of the data, both to understand the process of development and to explore the patterns (Liamputtong & Ezzy, 2005). The second advantage is the strong relevance of the research process and results. Qualitative research prioritizes the perspectives and experiences of participants, giving them a voice in the research process. This helps to ensure that the findings are more relevant and applicable to the real world

and also allows for a more comprehensive information profile of things (Opdenakker, 2006).

The third is more in-depth analysis. Qualitative research provides a detailed and nuanced understanding of social phenomena by allowing researchers to explore the context and meaning behind the experiences and perspectives of participants (Liamputtong & Ezzy, 2005). The fourth is flexibility. The timing and location of qualitative research can be flexible, and interview questions can be quickly adjusted to the quality and characteristics of the data recovered.

The qualitative analysis methodology also has several disadvantages. First, it has subjective limitations. Subjective factors such as knowledge, ability, and experience of the subject, the qualitative analysis process and results of the same thing may be different for different subjects (Munhall, 1988). Second, it is object-obscuring. The object of qualitative analysis may take certain ways to obscure the reality of things in the process of the subject's investigation and analysis, thus bringing difficulties or even misleading to the subject's qualitative analysis (Ratner, 2002). Third, the process and results are difficult to replicate.

Qualitative analysis is carried out by analyzing specific cases or selecting typical field research, and the typicality and representativeness of the samples have a certain uncertainty, because the replicability of the process and the generalizability of the results are relatively weak (Merriam, 2002). In this study, I used peer review and expert review methods, which can compensate for the shortcomings of qualitative research and enhance the credibility of the study.

Summary

This qualitative study adds knowledge and information to the current body of literature, as social media is considered a relatively new concept in the context of the rapid development of

technology and its impact on education. The qualitative research approach provides a rich description and personal meaning of the phenomenon under study. The experiences and perceptions of older learners using social media for learning have the potential to inform educators and designers of social media platforms about the importance of these platforms. It can lead social media engineers to understand the features that are critical to older adults' learning and guide them in designing educational platforms that are best suited for learning.

Participant Location and Recruitment

After determining the research methodology, we needed to determine where to recruit participants for this study, what method to use to recruit them, and what characteristics the participants should have. The choice of location and participants must fit the theme and research method of this study, and after research I chose Mulan Township, located in central China, as the site for participant recruitment in this study. In this section, I introduce the situation of Mulan Township, participant section, and participant recruitment.

Location of Participants

This study was designed from the beginning to target the study site in rural areas of China. For this study, China is a vast country with vast rural areas, and the rural areas vary greatly from region to region, so the choice of the survey site may not reflect the entire situation of media use among the elderly in rural China, but it needs to have some analytical significance, that is, to be able to say that the use of social media learning among the elderly in rural China is exploratory study. As Wuhan is the capital of Hubei Province, I am familiar with it, which makes it more convenient to conduct the study. Specifically, the data collected for this study came from a

survey of some villagers in Mulan Township, Huangpi District, Wuhan City, to understand the specific situation of social media learning among older adults in Mulan Township, as well as the conditions under which it occurs and the impact it has on older adults.

Mulan Township, Huangpi District, Wuhan City, China is a collection of villages located in the eastern part of Hubei Province, China, and older adults in Mulan Township, Wuhan City, Hubei Province, China were selected as the primary study population for two main reasons. First, there is a correlation between the level of social media use among rural older adults and the level of economic development, and Wuhan, the most economically developed city in central China, has greater potential for rural senior education (Sina Finance, 2022). Second, the seventh China Census shows that the aging population in Wuhan continues to deepen (National Bureau of Statistics of China, 2021). Given the aging of the rural population, the use of social media for learning by rural older adults in Wuhan's Mulan Township is representative and may provide a reference for future research on older adults in rural China.

The Mulan Township investigated in this study belongs to Wuhan City, Hubei Province, which is one of China's mega-cities and national central cities, the capital of Hubei Province, and a sub-provincial city. It is the largest city in central China and the political, economic, financial, commercial, logistic, scientific and technological, cultural and educational center as well as the transportation and communication hub in the central region. Wuhan is the geographical center of China's economy, one of the three major "inland river shipping centers" in China, and one of the largest railroad hubs and air and highway hubs in China in terms of passenger traffic. According to the seventh national census, Wuhan has a resident population of

12,326,500 by the end of 2020 (National Bureau of Statistics of China, 2021). Among them, the male population is 6,402,400 and the female population is 5,924,100; the rural population is 1,933,800 and the urban population is 10,392,700 (National Bureau of Statistics of China, 2021).

Mulan Township, which belongs to Huangpi District, Wuhan City, Hubei Province, is located in the northeastern part of Wuhan City, 35 km from the urban area of Huangpi District, with a total regional area of 169.1 km² (Huang, 2017). As of the end of 2019, the household population of Mulan Township was 51,232 (National Bureau of Statistics of China, 2021). Mulan Township is located in a low mountain hilly area, with ground elevations generally ranging from 55-150 m above sea level. the main natural disasters include low temperature rain, snow and ice, high temperature and drought, high winds, thunderstorms and floods. in 2011, Mulan Township had 38,000 mu of arable land, with 0.7 mu per capita (Huang, 2017).

Mulan Township has a total population of 51,000, of which 17,068 are permanent residents in the town, with an urbanization rate of 33.5%; there are another 3,500 mobile people. Of the total population, 26,000 are male, accounting for 52%; 24,000 are female, accounting for 48%; 12,540 are under 14 years old, accounting for 24%; 29,558 are 15-64 years old, accounting for 58%; 9,180 are over 65 years old, accounting for 18%; the population density is 301.6 people per square kilometer, and the per capita net income of farmers is 7,830 yuan (Huang. 2017). Food crops in Mulan Township are mainly rice and wheat, and the main cash crops are peanuts and oilseed rape.

Most villages in Mulan Township have special activity centers or activity rooms for the

elderly, and there are 38 in total. However, since these activity centers are almost all shared with village committees, they are forced to be set up upstairs, and many elderly people, because of their age and inconvenient legs, prefer to spend their time at home rather than going to the activity rooms to participate in activities. In addition, the activity rooms are small and can accommodate a small number of people, which makes it difficult to meet the needs of most rural elderly people, and those who have common interests can only organize themselves or concentrate on activities in the senior citizens' association.

Participant Section

This study is trying to understand the experiences of older adults in rural China using social media for learning, so the participants in this study need to fit the research topic so that more valid information can be obtained from the interviews. Participants were selected based on specific engagement criteria and consisted of individuals who had used social media as an educational learning tool for an extended period of time. There were no potential criteria for participants in this study other than those listed below. Specific sampling criteria were as follows:

- Living in Mulan Township, Wuhan, China
- Be between the ages of 60 and 75 years
- Have more than one year and less than three years of experience using social media for learning
- Have the decision-making capacity to agree to participate in the research
- Communicate in Mandarin

The age of the participants in this study ranged from 60 to 75 years old. This age range was chosen because the study will be conducted with older adults, and the definition of older adults requires that participants over the age of 60 be selected; however, older adults may experience memory confusion, slurred speech, and be more likely to feel fatigued during the interview process, which may negatively impact the interview. Therefore, the upper age limit is 75 years. The Tri-Council Policy Statement: Ethical Conduct for Research Involving Humans (TCPS2) (2022) states that one of the criteria for expressing consent is decision-making capacity. Decision-making capacity is the ability of potential or actual participants to understand information about the research project and to understand the potential consequences of their decision to participate or not to participate. Candidate participants aged 60-75 years who do not have the decision-making capacity to provide consent to participate in this study will also be excluded.

This study analyzes the current status of social media use for learning among older adults in rural China; therefore, older adults from rural China will need to be selected. Participants were required to have 1-3 years of experience using social media for learning, which ensured that participants were motivated to use social media for learning and that they had extensive experience using social media for learning. Setting the upper time limit of 3 years for participants to use social media for learning at three years is an appropriate choice. Because in the preliminary survey I found that when participants use social media to learn for more than three years, they no longer have a fresh feeling about social media and just consider it as a part of daily life, in this case, it is difficult to obtain the participants' feelings about social media, and

the participants will feel that everything is plain and there is no memorable experience to tell. It was acceptable for participants to speak in Mandarin or with a slight accent; candidate participants were excluded if they spoke in a dialect that was difficult for the researcher to recognize.

Participant Recruitment and Sampling

One of the distinctive features of social media is that people with common interests and people of similar age can easily form different group chats on social media. In these group chats, people with common interests can share relevant information and help each other. The participants in this study are from the group chats of the elderly learning enthusiasts in Mulan Township, which are formed on two different social media, QQ and WeChat, and there is no significant difference in the nature of these two social media applications. Currently, there are 246 people in the QQ-based group chat and 110 people in the WeChat-based group chat, all of whom are located in Mulan Township and all of whom have experience using social media for learning. After receiving approval from the University of Alberta Research Ethics Board, the researchers posted recruitment posters on the WeChat and QQ group chats, sent an initial contact letter for recruitment, and then sent a follow-up email confirming participation in the study. Please see Appendices A, B, C for the recruitment poster, initial contact letter, and follow-up recruitment script in Chinese and English.

Four older adults within the boundaries of Mulan Township, Wuhan City, Hubei Province, China were selected for this study, which was an appropriate sample size to collect information for a qualitative study (Creswell, 2014). Four participants was appropriate for this study due to

the relatively long time allotted to each respondent for interview and data analysis due to the semi-structured interview data collection method used in this study. If the number of participants is too large, it will be difficult to dig deeper into each respondent's experience, which is both time-consuming and difficult. However, if the number is too small, the data may lose its typicality and bias the results of the study. Four participants used various social media platforms for learning and had 1-3 years of learning experience. The data collected from this sample size is rich in the meaning of descriptive experience. For the purposes of the questions and objectives posed by this qualitative study, it was important to select participants who were willing to think about the questions and spend enough time thinking and answering them to provide in-depth and high-quality information.

As mentioned above, this study needed to ensure that the participants had a strong relevance to the research topic, and the number of participants in this study was limited. To obtain more data required that we select participants who could provide the most relevant research information, and purposive sampling ensured that the recruited participants met these two requirements.

Purposive sampling is a common sampling method used in qualitative research in which targets are selected because they have the characteristics needed for the study; in other words purposive sampling is used to extract the person, time, or place that will provide the greatest amount of information to the research question (Chen, 2004). Specifically, purposeful sampling is not arbitrary; the selection of the sample is based on pre-identified criteria. Purposive sampling means that factors that are important to this research question should be considered

primarily in sampling, rather than how general they are (Chen, 2004). Purposive sampling is logically based on the fact that the individuals in the sample have much and rich information about the situation being studied in depth; it does not assume that the members of the aggregate are reciprocal sources of information, but rather it is convinced that those selected are providers of rich information (Chen, 2004). This sampling method has the advantage of obtaining as much research data as possible with limited resources and time, but because the selection of sample units depends on the subjective judgment of the researcher, the results are subject to some risk of error.

The sample criteria for this study are mentioned in the Participant Section, that is:

- Living in Mulan Township, Wuhan, China
- Be between the ages of 60 and 75 years
- Have more than one year and less than three years of experience using social media for learning
- Have the decision-making capacity to agree to participate in the research
- Communicate in Mandarin

In this study, after receiving responses from potential participants to the initial contact letter, I communicated with potential participants via WeChat to ensure that potential participants met the above criteria, and only after confirming that participants met all relevant criteria did I send follow-up emails to potential participants confirming their participation in the study, and after obtaining four participants through purposeful sampling, I stopped participant recruitment.

Data Collection Method

Data are collections of facts, figures, objects, symbols, and events collected from different sources (Harrell & Bradley, 2009). The three popular ways of collecting data for qualitative research are interviews, observations, and archival analysis. Of these, interviews are an important data collection tool in qualitative research because they allow participants to talk fully about their own experiences and perspectives, and can provide richer data than open-ended questionnaires. There are four types of interviews, focus group interviews, structured interviews, semi-structured interviews, and unstructured interviews.

The main difference between focus groups and other types of research (e.g., individual interviews) is that the discussion group setting facilitates data collection. A focus group is more than just getting a group of people together to talk; it is a special type of group in terms of size, purpose, composition, and procedure. The purpose of a focus group is to hear and gather information. Participants are selected because they have certain characteristics in common that are somehow related to the focus group topic. Focus group discussions are often led with pre-determined questions that are more like an in-group survey than an interactive discussion. Focus group discussions nowadays often have 30 and more questions, thus reducing the time for participants to respond and the facilitators feel rushed to carefully detect subtle responses. For this study, it was difficult to organize all participants into a group due to the time difference, so the focus group interview method could not be used.

Structured interview is a type of interview that has a high degree of control over the interview process. Participants for such interviews must be selected according to uniform

criteria and methods, generally using random sampling. The interview process is also highly standardized, i.e., the questions asked of all interviewees, the order and manner in which they are asked, and the manner in which the interviewees' responses are recorded are completely uniform. The advantage of a structured interview is that if a question is unclear or ambiguous, the interviewee can ask the researcher for clarification. The unstructured interview, on the other hand, is the exact opposite of the structured interview; it is a semi-controlled or uncontrolled interview. Compared with structured interviews, it does not have a predetermined questionnaire, forms, or standard formulas for asking questions, but only gives the investigator a topic on which the investigator and the participant are free to talk, and the participant is free to express his or her opinions and feelings without regard to the investigator's needs. At any time. This type of interview is more flexible and easier to make the respondent feel comfortable, but the respondent may lead the conversation away from the topic.

The semi-structured interview was used in this study. Semi-structured interviews have the advantages of both structured and unstructured interviews. In a semi-structured interview, the researcher has some control over the structure of the interview while allowing for active participation by the interviewee. The researcher has an outline of the interview and can ask the appropriate questions according to the research design. The interviewer also has the flexibility to adjust the interview according to the interview procedure and content. Semi-structured interviews were the best choice for data collection in this study because they allowed Chinese older adults to freely share and comment on their experiences with social media learning.

The interviews began with demographic information, such as age and family status.

Information about the participants' academic and life backgrounds was also collected. The interviews were then followed up with the following interview questions to provide rich information about the research questions. The interview questions were based on the following categories:

- Demographic Information
- Life Background
- Learning Background
- Learning Behavior
- Learner Perceptions of Knowledge Dissemination
- Impact on Learners

These categories were sourced in two parts, the first was from pre-interview communications with participants, from which I extracted categories that could help answer the research questions. The second came from the extensive qualitative research literature on social media, rural China, and informal learning, which inspired me to identify specific interview questions and categories of interview questions.

For this study, each of these categories is very important; they correspond to different research questions and they are also directly related to the amount and accuracy of the data obtained. For example, the life background section allowed me to understand the participants' family situation and details of their daily life, which helped us to analyze the influence of interpersonal relationships on the participants' learning using social media, and also to analyze the influence of the rural living environment on the participants' learning behavior. The learning

behavior section allows us to understand what learning behaviors participants have when using social media for learning, how they communicate with others, and which social media software they tend to use for learning. The categories of these interview questions were very helpful in answering the research questions. Please see Appendix D for the actual questions used in this study.

Data Collection and Analysis Procedures

The process of collecting data involves several key procedures that the researcher must design and follow. Data collection means obtaining the necessary permissions, selecting instruments and sampling strategies that will best answer the research questions, selecting instruments to record information, storing data, and ensuring that ethical issues are addressed (Harrell & Bradley, 2009). In order to conduct qualitative research, the researcher must select qualitative data sources such as interviews and observations (Creswell, 2013). Under normal circumstances, the semi-structured interviews for this study could have been conducted face-to-face in a private setting. However, because COVID19 was declared a pandemic at the time of this study's design, most people study or work at home to practice social alienation. Therefore, the semi-structured interviews for this study were conducted as voice sessions via Zoom or the participant's preferred platform, with audio data captured and handwritten notes recorded using the zoom recording feature or the software that comes with the Macbook. Zoom recordings were downloaded to a local computer immediately after the interview rather than stored on the Zoom Cloud. The participants were communicated with in Chinese during the interviews and the data were recorded in Chinese, the Chinese information was imported into

the nvivo software during the data analysis, and all the Chinese data were translated into English when the data analysis phase was completed. To ensure the accuracy of the translation, the Chinese and English versions of the data were repeatedly compared using Google Translate and Deepl software. APPENDIX E provides specific translation and checking steps and shows the original Chinese and English translations of some of the interview data.

Prior to beginning data collection using the recording software, the researcher informed participants of the upcoming data collection. Audio data collected at the end of the interview was recorded in text form and transcribed. The transcribed Chinese raw data were translated into English and saved, and these English data were used in the data analysis and presentation of findings sections. The data were coded using nvivo software in order to increase the reliability of the study and the efficiency of the study. Data were collected from five participants who met the criteria and all had experience using social media as a learning tool. Each interview took approximately 60 minutes. Data were collected from participants' responses to open-ended questions about the use of social media as a learning tool. The researcher took written notes during the interviews to record the participants' tone of voice and responses to certain important questions. To improve the reliability of the experiment and to facilitate communication with the interviewees, information about their age, gender, work status, WeChat number, QQ number, and the type of social media participants used for learning was also collected.

Security and Confidentiality of Data

In order to ensure the confidentiality of the participants and to comply with the University of Alberta Research Ethics Board, I took several steps to ensure protection, minimal

risk, and fairness for all participants. First, the contact details of the interviewees, with the exception of their age, and identifying information obtained from this study are confidential and no identifiable information about the participants will be stored in the data. At the beginning of the interview, the researcher asks the respondent to choose a pseudonym, which is used in the data to refer to the respondent in order to keep the respondent's information secure. Second, only the researcher and thesis supervisor has access to the data before and during transcription. The raw data after transcription and the anonymized processed data will be stored encrypted on a computer with a password and backed up on a Google Cloud Drive with a password, and only the researcher and supervisor will have access to the data after transcription.

Third, during the study, all audio data and post-transcription data will be stored encrypted on a password-protected computer located in the researcher's graduate residence at the University of Alberta, and this computer will not be moved during the study. All data will also be encrypted and backed up on the researcher's password-protected Google Cloud Drive. At the end of the study, all data on the computer is deleted, the audio files and transcribed data on the Google Cloud Drive will be retained, and all data will be backed up to the researcher's protected cloud drive. After five years, the data on the researcher's and supervisor's cloud drives will be deleted. Fourth, when the thesis is completed, all identifying information will be deleted. Raw audio and research data will be stored encrypted on the researcher's encrypted Google Cloud Drive and the supervisor's protected cloud drive for at least five years, and after five years (approximately 2028) all research data will be deleted.

Data Analysis Method

Grounded Theory

Grounded theory was first proposed by two American scholars, Barney Glaser and Anselm Strauss, in their 1967 book, *The Discovery of Grounded Theory* (Glaser & Strauss, 1967). It was first used in pathological case studies, but later, thanks to the efforts of Glaser and Strauss and many other scholars to promote and apply it, it has been enriched and improved and is now widely used in other social sciences such as education, management, and cultural studies. Grounded theory is not an entity theory, but an approach to qualitative research, or a method for analyzing qualitative data (Corbin & Strauss, 1990). It can be seen as one of the many paths in the field of qualitative research, other paths being: ethnography, phenomenological research, biographical research, etc.

In its continuous development, grounded theory has been influenced by other schools of thought at the same time, especially by pragmatism and the Chicago School of Sociology more obviously (Fisher & Strauss, 1978). American pragmatism, represented by Dewey, emphasizes the importance of action in problem solving, and flexibly adopts different solutions to problems according to the reality of the situation (Hallberg, 2006). The Chicago School of Sociology, represented by Albion Small, emphasizes understanding social interaction, social processes, and social change from the perspective of the actor (Fisher & Strauss, 1978). Both schools are similar in that they emphasize that theory emerges in action, and that theory must emerge from and remain closely related to information. Later, influenced by the trends of pragmatism, constructivism, and postmodernism, several versions of procedural grounded theory,

constructive grounded theory, and postmodern contextual analysis were formed based on different ontologies and epistemologies.

In contrast to Glaser, Strauss and Corbin provided a more structured set of coding procedures and analytical tools (Corbin & Strauss, 1990). In 2003, Clarke published *Situational Analyses: Grounded Theory Mapping After the Postmodern Turn*, which shifted the focus of grounded theory from the theoretical generation pioneered by Glaser and Strauss to contexts, social fields, and texts (Clarke, 2003). In 2006, in *Constructing Grounded Theory*, Charmaz reconstructed grounded theory from a constructivist standpoint, arguing that both data and theory are not discovered, but constructed (Charmaz, 2014). Any form of theory is an interpretive image of the world being studied rather than what the world actually looks like (Charmaz, 2014).

In general, grounded theory is an analytical tool that integrates data information, which is collected from field interviews and research, observation of everyday life, etc., and through continuous refinement of conceptual labels, sprouts from data information in stages of a theory that can reveal and clarify the essential connotations of similar events or similar phenomena (Glaser & Strauss, 1967). It involves an interactive process in which researchers collect and interact with data, explore categories or themes through coding, and develop experimental theories (Glaser & Strauss, 1967).

Glaser and Strauss represented that grounded theory contains the following main implications: (1) simultaneous data collection and analysis; (2) the purpose of sampling is to build theories, not to generalize the population; (3) the literature review is an analysis

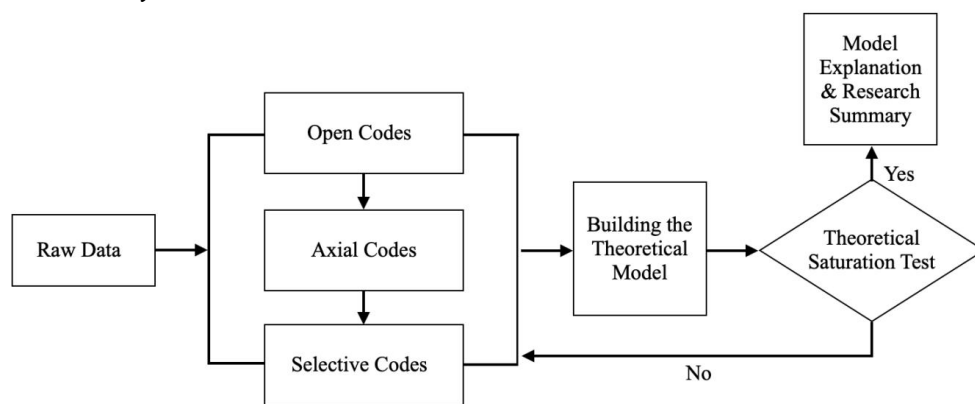
conducted after an independent study is conducted; (4) the analysis codes/categories are constructed from data rather than preconceived, logically derived hypotheses; (5) memo writing is used to clarify the relationship between categories and categories of attributes of categories; (6) comparative methods are used to understand and examine the data; and (7) theory development is ongoing and is improved at each step of the analysis (Glaser & Strauss, 1967). The grounded theory method is widely used in research in various disciplines, and it allows for refining codes and constructing theories from the data.

This study’s use of a grounded theory research approach can help me capture more deeply the experiences of learners in rural China who use social media to learn, allowing for a multi-faceted analysis of the interview material at multiple levels.

Data Analysis Flowchart

Figure 3

Data Analysis Flowchart



Note. Pandit, N. R. (1996). The creation of theory: A recent application of the grounded theory method. *The qualitative report*, 2(4), 1-15.

Research Ethics Considerations

Research ethics refers to a set of guidelines and obligations that guide and govern the ethics and behavior of researchers in scientific research and its related scenarios, including obtaining the voluntary consent of subjects, allowing them to end their research participation at any time, minimizing subject risk and suffering, and ensuring that the expected research benefits outweigh the research risks (Israel & Hay, 2006). Social science research ethics covers three main areas: first, the researcher's own behavior, including academic integrity, collegiality, and social responsibility; second, the protection of research subjects, including informed consent, anonymity, and harm avoidance; and third, the protection of research-related groups and environments (Israel & Hay, 2006).

In this study, I sought approval from the Alberta Research Ethics Board to ensure that the rights and welfare of all participants in my study were protected. Each person who volunteers to participate in my study will be made aware of the measures taken to ensure that their identity is not revealed. Participants who volunteer to participate in interviews will be asked to submit WeChat contact information. After the interview participants were identified, all personal information about the participants, except for their age, was removed from the collected data. All voluntary participants will be informed prior to participating in the study that all data relating to them in the study, except for age, will be anonymous and that no information will be disclosed.

Participants are also informed that participation in the study should be voluntary, that the study will not affect their normal lives in any way, and that they can withdraw at any time

during the interview process. Participants were also informed that they could withdraw their responses from the study at any time within two weeks of data transcription, and that the researcher would completely delete their data. If it is longer than two weeks, the participant's withdrawal request will not be granted as the data will be transcribed and anonymized after two weeks. Participants will still voluntarily participate in the study after being informed of all rights regarding ethical aspects, and I will ask participants to read in detail and agree verbally to the informed consent form (see APPENDIX F). The participant's verbal consent will be recorded.

Establishing Trustworthiness

In qualitative research, researchers need to use a number of different approaches in order to ensure the credibility of their findings. In order to complete qualitative research that is accepted by both the academic field and practice, each researcher must design the study carefully and maintain relevant ethical procedures. Many methods that can detect reliability and validity are used in qualitative research, which can ensure the credibility and quality of qualitative research (Golafshani, 2003). In qualitative research, trustworthiness would be considered as a form of reliability and consistency (Guba, 1981). Qualitative researchers use multiple techniques (e.g., interviews, participation, photography, research archives) to consistently record their observations. Qualitative researchers expect their observations to be consistent over time (Golafshani, 2003). Validity as used in qualitative research refers to a relationship that is consistent between the findings of the study and the rest of the study. When we say that a research result is "true and reliable," we mean whether the "representation" of the result is a "true" reflection of the researcher's use of the research question for a specific purpose under

specific conditions, and the methods appropriate to the researcher's study of something for a particular purpose (Brink, 1993). In general, in a qualitative study, researchers need to choose multiple ways to ensure credibility and validity. In this study, I chose two ways to ensure the trustworthiness of the study: member check and theoretical saturation test.

Member Check

Member check, also known as participant validation, is a process of returning research data or findings to participants that checks the accuracy and meaning of the data and the resonance of relevant research concepts with participants' experiences (Birt et al., 2016). The specific purpose of member checking is to check that participants' realities and experiences are accurately presented, to provide them with the opportunity to correct errors, to assess the researcher's understanding and interpretation of the data, and to provide participants with the opportunity to reflect on their experiences (Earnest, 2020). In this study, the researcher transcribed the recorded interviews within 48 hours, transmitted the transcribed textual material to the interviewee via WeChat in a timely manner to see if it matched the meaning he intended to convey. The participants were also asked to comment on the extent to which the findings from the data analysis matched the individual's actual situation after the data analysis was completed, and further improvements were made after receiving feedback from the study participants.

Theoretical Saturation Test

The theoretical saturation test is a method used in the coding session to ensure trustworthiness, which is a saturation and trustworthiness test of the main categories with the aim of ensuring the objectivity of the coding results. The criterion for the saturation test to reach

theoretical saturation is that no new concepts emerge when testing new data and that these new data have a corresponding class to them.

In this study, the theoretical saturation test was conducted with 1/3 of the original interview data reserved for the fourth interviewee, and theoretical saturation was reached when no conceptual expressions different from those appearing in the previous interviews emerged, except for the four main categories (reasons, experiences, benefits, and challenges), according to the information shown in the interview data.

Limitations

Research limitations are systematic biases that are beyond the control of the researcher and may affect the results of the study (Price, 2004). The participants in this study were rural older learners who had experience using social media and were from Mulan Township, Wuhan City, Hubei Province. These individuals represent a subgroup of rural older adults in China . The target population was all rural Chinese older adults who use social media for learning. Therefore, the results of this qualitative study cannot be fully generalized to all rural Chinese older adults. However, its findings from this study can be applied to other similar educational settings and contexts.

In addition, during the study design phase, China was still in the midst of COVID-19 pandemic, which has led to increased governmental control of entry and exit in various countries around the world, and China is no exception (Cucinotta & Vanelli, 2020). Therefore, this study used Zoom conferencing software to interview participants online. Compared to offline interviews, this study will not use a camera and the sense of communication will be weaker,

which may result in some missing information, but the researcher will try to compensate for this limitation with interview techniques.

Finally, in terms of language. This study used Mandarin to talk to the participants, and all the information the participants obtained on social media was expressed through Mandarin. Therefore, the results of this study may only be applicable to the linguistic context of Mandarin, and further investigation is needed for the application to other linguistic contexts.

Delimitations

Delimitations of a study refers to the choices made in the design and intentionally introduced by the researcher (Price & Murnan, 2004). In this study the researcher conducted interviews with older adults who had experience using social media for learning within a specific geographic area. In addition, the researcher utilized only one type of software to transcribe the data.

Assumptions

Assumptions are expectations that the researcher believes to be true, but is not supported by empirical evidence or tested scientifically (Creswell, 2013). Assumptions are often based on some realistic logic and reasoning, but lack valid evidence or validation (Creswell, 2013). In this study, the researcher hypothesized that each participant answered the questions honestly during the interview. Each participant honestly expressed his or her experience using social media for learning. Furthermore, I believe that social media technologies have not been adapted to older adults' learning, even though they have an impact on the learning experience. Although many social media platforms have content or boards related to learning, those designed specifically for

learning purposes are not yet well developed.

Chapter Outline

Chapter 3 is an important part of the study, which explains in detail the different steps and processes required for this qualitative study. It outlines the research design and methodology of this study. In the next chapter I provide a detailed description of the process of data analysis mentioned in this chapter.

Chapter 4: Data Analysis

The purpose of this qualitative study was to explore the learning experiences of older learners in rural China who were using social media as a learning tool. To understand the learning experiences of older learners, this study explored the various types of social media used and the experiences of older learners in rural China when using these social media, their perceptions of the benefits of social media as a learning tool, and their perceptions of the challenges of using social media as a learning tool. This chapter includes the following: (a) interviewees, (b) coding process, and (c) model construction. This chapter concludes with a summary of the results of the data analysis.

Interviewees

There were four respondents in this study, all from Mulan Township, Wuhan City, Hubei Province, China, aged 60-75 years old, with 1-3 years of experience using social media for learning. The names of each of the interviewees are pseudonyms. The details of each respondent are listed below.

Interviewee 1: Tian Lu

Tianlu, male, 60 years old, has a bachelor's degree from university. Tianlu went to university in the 1980s, entered the urban area of Wuhan to work, and returned to the rural area five years ago. He currently lives in a village far from the center of Mulan Township, about a half-hour drive from the central area. Tianlu lives in the house located in Mulan Township with his daughter, son and wife.

During the day, his wife and children go to work in Wuhan City, and Tianlu works alone in

the house, and they rest together in the house at night. His daily life is relatively regular. He wakes up at 8 am to cook breakfast for the whole family, and after the family finishes eating and goes to work, he enters his study and works until 12 noon for a lunch break, and continues to work at 2 pm to contact with customers and the company side. At 5 pm, he starts to prepare dinner for the whole family, and at 7 pm, he goes out for a walk and talks with friends, and rests at 10 pm. Tianlu works as a trader in international trade, with flexible working hours, and all the work can be done on the cell phone, so he only needs a cell phone and a computer to complete his tasks.

The social media that Tianlu uses are mainly Tiktok, Xiaohongshu, WeChat and QQ. He learns about and uses these social media in two ways: QQ and WeChat because of the need to work, and the company will unify the training for employees to learn how to use QQ and WeChat. Xiaohongshu and Tiktok are the advertisements that Tianlu saw when using search engines and downloaded them out of curiosity, and then asked his daughter and subordinates to learn how to operate Tiktok and Xiaohongshu. He spends more than three hours a day using social media, with no fixed time of use, and opens the social media software on his phone whenever he wants to read news or watch funny videos. He uses these social media for the purpose of getting information, searching for work-related materials and reading news, and does not actively post information.

Interviewee 2: Xiu Cai

Xiu Cai, male, 73 years old, college degree. Xiucan used to be an engineer in a hydroelectric power station, worked in downtown Wuhan, retired ten years ago, and has been living in Mulan

Township since his retirement. Xiucai has four children, three sons and one daughter. All three sons are married and each son has a child, and he now lives with his youngest son in Mulan Township. The eldest and second sons are now working in downtown Wuhan and come to see Xiucai once every six months. The village where Xiu Cai is located is far from the center of Mulan Township and has good infrastructure with concrete roads and street lights. The village environment is also good, next to the river, there is a small park built by the government, some elderly people like to chat in the park, occasionally there are some singing and dancing activities.

Xiu Cai's youngest son leaves for work at Mulan Township Center before 8:00 a.m. He gets up at 6:00 or 7:00 a.m. in summer and 8:00 a.m. in winter to wash up and then goes out to the village market to buy vegetables. After the shopping, he comes home at about 11:00, and uses his cell phone in the study to watch Tiktok and learn about national and social events, and then cooks and eats at noon at 12:00. After eating, he takes a nap for an hour. In the afternoon, he likes to walk around the village, find friends to chat and play cards, and in the evening, after eating, he watches entertainment news on Tiktok or QQ.

Xiu Cai originally did not know about social media at all, but then a friend told him that he could use Tiktok to watch some video news. He was interested in various types of news, so he asked his granddaughter for help. She helped Xiu Cai install the software on his cell phone, helped him register an account, and then taught him how to use it, first in what ways he could find the areas he was interested in, and then taught him how to search, how to save videos of interest, and how to follow other people's accounts.

Interviewee 3: Lin

Lin, male, 61 years old, with a secondary school education. Lin lived in the countryside until he was 20 years old, and went to secondary school in Wuhan City when he was 20 years old, after which he stayed in Wuhan City to work in the urban area and retired to live in Mulan Township three years ago. The village where Lin lives is close to the river, about 2 km from the center of Mulan Township. The village as a whole is relatively affluent and large in scale, with more than 500 residents. Ten years ago the village committee funded the widening of the concrete road, placed street lights along the road, reinforced the mountain to prevent mudslides, treated the sewage from the pond, and built a temple, a supermarket, a square and a living center for the elderly. The vast majority of the village's land has been entrusted to an agricultural enterprise for rice cultivation, which pays each villager a certain amount of rent, currently the main source of income for the village's residents. The use of Lin's family's land has likewise been entrusted to the village committee for lease to the agribusiness, leaving only 2 hundred square meters of land for growing vegetables.

Lin has one child who now works for a company in Beijing. Both Lin and his wife are retired and they live together in Mulan Township. Lin's life in general after getting up in the morning to go out for a walk, walk back to eat breakfast. He spends most of his time in the morning practicing brush writing and learning calligraphy on his phone with Tiktok, sometimes resting at noon, sometimes not resting to open Tiktok to watch news videos, and in the afternoon going out to chat with friends. In the evening, Lin occasionally drinks some wine, then opens social media to see what interests him, sometimes with relatives and friends video chatting, and goes to bed around 12:00.

The social media Lin uses are mainly Tiktok, WeChat and QQ, of which he first learned to use QQ because he needed to use it to communicate with customers at work, but he wasn't skilled at that time. After he retired, Lin found that people shared their chess skills through QQ, so he learned how to use QQ in detail through search engines, and now he can post his chess lessons in QQ skillfully. Lin learned about Tiktok through a friend who found that there were many people uploading videos teaching calligraphy in Tiktok and recommended it to Lin. Lin has no set time to use social media, he uses it to get news, learn calligraphy and chess skills, and find solutions to his life challenges (e.g. learning to install his own Wi-Fi).

Interviewee 4: Zhang

Zhang, female, 61 years old, has a secondary school education. Zhang lives in a large village with more than 400 families, which is far from the center of Mulan Township, an hour's drive away. Zhang has lived in the countryside all her life and makes her living by farming. Her husband works in downtown Wuhan and has three children, two of whom work in Wuhan and the youngest daughter works in Mulan Township. Zhang's husband is a construction worker with a busy schedule and comes home once a month, the children come back about once a month to a month and a half, plus they usually come back on New Year's Day, and usually her youngest daughter lives with her in Mulan Township.

Zhang's income mainly comes from renting out her land to other farmers in the same village. Now her job is to grow some vegetables in her yard and raise some chickens and ducks. There is an activity center for the elderly in Zhang's village, but as a woman she rarely goes there because it is basically filled with elderly men smoking and playing cards, resulting in poor

hygiene. Zhang usually spends her leisure time mainly going to the Buddhist temple to recite the sutra and learning crafts and cooking on Tiktok. After making breakfast for her daughter in the usual morning, she chooses to call her friends to go together to the Buddhist temple to recite the sutra, which is a social place for women, and they communicate about the recent happenings in the village until noon. In the afternoon Zhang would first go to work in the fields, watering vegetables and feeding chickens and ducks. If she has any time left over she will learn crafts and how to make cakes and dishes on Tiktok so that by evening she can make innovative dishes for her daughter to eat after she gets off work.

Zhang's most commonly used social networking software is Tiktok and WeChat, both of which her daughter taught her. She wanted to learn to use WeChat because she had a need to communicate with friends, and she learned to use Tiktok because her daughter told her that many people on Tiktok post novel ways to make dishes, which sparked Zhang's interest. In the process of learning, Zhang often forgot some of the social media operations due to the poor memory of the elderly, which caused her daughter to teach her six times over.

To facilitate comparison and analysis, in table 2 I present the basic information of the four participants in tabular form.

Table 2

Information for Participants

Name	Tian Lu	Xiu Cai	Lin	Zhang
Gender	Male	Male	Male	Female
Age	60	73	61	61
Education	Undergraduate	College	Secondary School	Secondary School

Family	Married, two children, a daughter and a son	Married, four children, three sons, one daughter, one granddaughter	Married, one child working in a company in Beijing	Married, three children, two children working in downtown Wuhan, daughter working in Mulan Township
Work	Work in international trading company	Retired, used to be an engineer	Retired, used to be a worker	No work
Residence	He lives in a village far away from the center of Mulan Township, about half an hour's drive from the central area	His village is far from the center of Mulan Township with good infrastructure	About 2 kilometers from the center of Mulan Township	The residence is far away from the center of Mulan Township with 1 hour drive
Public Education Facilities in the Village	Unknown	Unknown	There is an activity center for the elderly in the village, but it is not usually open	There is an activity center for the elderly, but it is used as a chess room by men
Daily Study Frequency	More than ten times	More than ten times	More than ten times	More than ten times
Daily Study Hours	About two hours	About four hours	More than six hours	About 4-5 hours
Learning Content	Work-related materials and news	News	Life skills, calligraphy, chess and news	Life skills, cooking, travel and news
Social Media Software	Tiktok, Xiaohongshu, Wechat and QQ	Tiktok and QQ	Tiktok, Wechat and QQ	Tiktok
Learning How to use Social Media Software	Through daughters, subordinates and company training	Through granddaughter	Through friends and company training	Through daughter

Introduction to the Coding Process

In this study, the grounded theory proposed by Strauss and Corbin was used as a guiding method for coding the raw research data at three levels (Corbin & Strauss, 1990). Grounded theory is one of the scientifically valid research methods in qualitative research, and its main purpose is to build a theory from the original data, a bottom-up method of continuously condensing the data to build a substantive theory (Corbin & Strauss, 1990). A total of approximately 400 minutes of audio recordings were collected from the four interviewees, as well as approximately 70,000 words of transcribed text. The audio recordings were transcribed into a textual text within 48 hours after each interview to ensure the completeness and accuracy of the original data. The coding tool used in this study was Nvivo analysis software. The coding process in this study was divided into three stages.

Open Coding

Open coding is the process of analyzing a large amount of transcribed text, coding the content of the primary source material conceptually and categorically by taking the sentences, paragraphs, and themes of the text as units. In the open coding stage, all the collected materials were broken up into a number of reference points, each of which received a code that categorized the different codes.

Axial Coding

This stage is to categorize the nodes obtained in the open-ended coding stage, combining nodes with similar meanings under the same concept, and categorizing nodes with more different meanings separately, so that these categorizations have obvious external distinctions

and internal similarities.

Selective Coding

The formation of core concepts is the purpose of selective coding, i.e., to summarize and conclude all the categorizations that have been found. The core concepts can be used as a generalization of the entire findings and are explanatory of all findings. In this study, all the categories of primary and secondary coding were continuously reflected on, with the aim of linking and summarizing all the coded categories to form a systematic conceptual structure.

After the three stages of coding were completed, I used Google Translate and deepL translation software to translate the coded data into English and repeatedly compared the translated English data into Chinese with the original Chinese data to ensure the accuracy of the coding and translation.

Detailed Coding Process

After entering all interview transcripts into the Nvivo analysis software, the researcher began an iterative and reflective process of coding the data. The following process allowed the researcher to scrutinize the data, identify common themes, provide thematic analysis, and draw conclusions.

Open Coding Process

In the open coding process, I labeled and categorized the interview data by carefully reading the original text. In the processing of the four interview data, the interviewee data were first coded. The first step was labeling, coding the original data sentence by sentence, completing generalizing the phenomenon and defining the concept, and extracting the primary concept from

the original data. Take the coding of the third participant Lin as an example, firstly, we sorted out the primary data and coded the words "So far, as long as you do not consciously disclose something, then generally speaking, it is safe to use social media, such as WeChat, I know that when I use WeChat to communicate with others or read news, it will not disclose my personal information", which can reflect the security of social media. The primary concept "can protect personal privacy" was extracted from the words and sentences that reflect the security of social media, and then the concepts were compared and simplified into the primary category "security of social media" by merging similar concepts.

For example, from the original data of "At the beginning, I just opened Tiktok, which is different from other software I know, and it has no newbie tutorials, you know how slow the elderly are in accepting software, I didn't know how to operate it at all, but later I asked my daughter to know the basic operation, and then I slowly figured it out by myself", I extracted "lack of newbie tutorials". From "Everyone can post some small videos about their life or learning on Tiktok, and then we can watch the video and communicate with others, including the author, in the comment section", "communicate with others" is extracted. I used the Nvivo software to compile a total of 67 relevant tags, and finally came up with 37 relevant concepts. Finally, after repeated comparison of the original interview data, a series of codes that did not have full reference meaning (frequency of occurrence ≤ 2 , repeated or similar content, contradictory meaning) were screened out, and the remaining codes with full reference meaning were regrouped and numbered, resulting in 35 related elements.

After that, we repeatedly compared the similar concepts and extracted the more general

concepts, i.e. elements. For example, the initial categories of "intergenerational interaction", "group interaction" and "one-to-one interaction" were compared to extract the theme of "interaction behavior. The elements of "interaction behaviors" is extracted by comparing the initial genera of "intergenerational interaction", "group interaction", and "one-to-one interaction".

Axial Coding Process

In the process of axial coding, the main purpose is to further cluster and summarize the categories obtained from open coding, and to explore the internal connections between their categories. Therefore, the purpose of this study's axial coding is to discover the logical relationships between the elements of social media as a learning tool behavior of rural Chinese older adults, and to further categorize and refine the categories. In conducting the axial coding, the eight elements were grouped into four main categories of reasons, experiences, benefits, and challenges based on the relationships between the categories and the research questions of this study.

Selective Coding Process

The selective coding process is a process of further comparing and connecting the relevant concepts, categories, and relationships summarized in the first two steps, enabling the researcher to identify core themes from the interview data (Boyatzis, 1998). After constructing the elements and primary categories, this study analyzed the relationships between the primary categories by analogy and systematically constructed a "core category", which is the core concept of this study, and through the process of selection and coding, clarified and

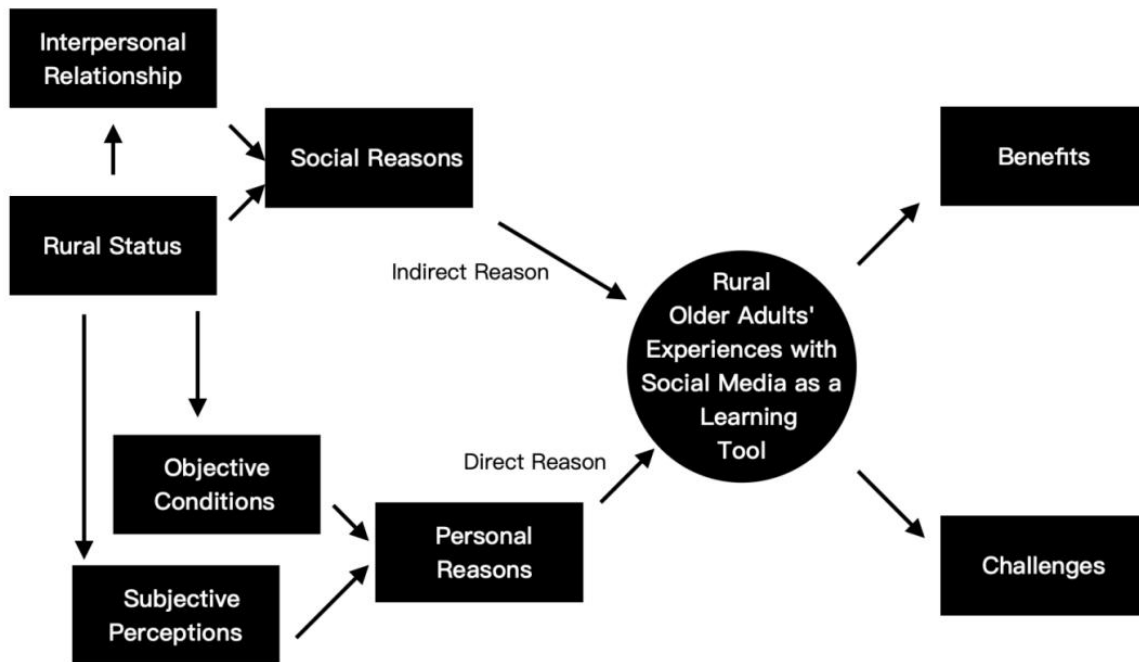
demonstrated the relationship between the core category and the primary and secondary categories to further understand the data. The primary theme of social media use as a learning tool by older adults in rural China was the connecting thread that ran through all of the data, and the themes were associated with each corresponding category related to the research questions. APPENDIX G provides a summary of the categories, themes, and elements identified from the data in relation to each research question.

Model Construction

Based on the three-level coding of the raw data, the relationships between the primary and secondary categories were basically clear. The "story line" of the study was extracted by synthesizing the relationships between the categories at each level and the relationships between the primary categories. Personal reasons are the direct reasons for the use of social media as a learning tool by older adults in rural China, and social reasons are the indirect reasons for the use of social media as a learning tool by older adults in rural China. The rural status quo in the social causes affects interpersonal relationships, subjective perceptions, and objective conditions. The direct and indirect causes together contribute to a variety of behaviors such as interaction behaviors, learning behaviors, and usage behaviors that result in the use of social media for learning by older adults in rural China. Following the learning behaviors, two perspectives on using social media for learning emerged, i.e., benefits and challenges. Therefore, the theoretical model of this study is shown in Figure 4.

Figure 4

Model of Social Media Use as a Learning Tool by Older Adults in Rural China



Summary

This chapter presents basic information about each participant and describes in detail the process of data analysis using grounded theory. In the next chapter, the three research questions posed in this study are answered and the findings of the data analysis are presented.

Chapter 5: Presentation of Findings

The previous chapter combed through the three levels of coding of grounded theory to identify the relational structure of the main categories and elements. In this chapter, I will use the findings from the data collection to answer my three research questions. Since the second and third research questions examine the benefits and challenges of using social media as a learning tool, I the findings will be used to answer the questions in the same section. The elements that emerged were organized into four main categories related to rural older people's use of social media as a learning tool - reasons, experiences, benefits and challenges.

Reasons, which refer to the reasons (both social and personal) why rural older adults use social media as a learning tool. Experiences, which refer to rural older adults' experiences of using social media as a learning tool, including learning tools, learning behaviours, use behaviours and interaction behaviours. Benefits, the benefits that rural older adults gain from using social media as a learning tool. Challenges, challenges faced by older adults in using social media as a learning tool. Each of these four main categories corresponds to the three research questions. The relationships between all the main categories and elements will be analyzed specifically in relation to the research questions in this chapter, and all participants' statements are shown under pseudonyms.

How Older Chinese Learners Use Social Media Tools for Learning

Starting from the raw data and the elements obtained through the raw data, the participants provided some important insights, which leads to a thorough to answer to the question by combining the elements. According to the research findings there are two main categories

related to this research question: reasons and experiences. In this case, the reasons category explains why older Chinese people in rural China use social media for learning from both social and personal reasons. The experience category states the reasons for using social media for learning in terms of learning tools, learning behaviors, use behaviors, and interactive behaviors, which states the current situation and experiences of rural Chinese older adults using social media for learning. In the next section, I will analyze these two main categories from the perspective of each element. The main categories and relationships of the elements of this section are organized graphically in APPENDIX H.

Reasons

This section states the reasons why older adults use social media for learning, a learning behavior that is the result of a combination of factors, based on the interviews. Specifically, the reasons are social and personal. In this study, Rural China is the region where the participants live and is somewhat closed. Its special economic and cultural aspects have an impact on older people's choice of social media learning. The elements included in the main category of reasons are access to educational resources, access to educational activities, family situation, social interaction, leisure time, past experiences, health conditions, ideology and personal preferences.

Social Reasons

In this study social reasons refer to the impact that older people's living environment and relationships have on older people's use of social media for learning. In this case, the particular learning environment of rural areas affects older people in several ways.

Rural Status. The current situation in rural China is different from that of the cities in several ways, and because of their long history in rural environments, older people in rural areas are more suited to rural life, while at the same time accepting the influences that come from the countryside. One participant said, “I am quite used to life in the countryside, I grew up in the countryside, and I also have a few friends in a village, so I can usually go to them to chat, and no one comes to bother me, it's very free” (Xiu Cai, personal communication, March 4, 2023). On the one hand, the level of infrastructure development and environmental management in the countryside is rapidly improving, which makes older people more willing to stay in the countryside and enjoy a relatively closed and peaceful life. A participant explained:

“Rural villages are now more tidy, unlike the old days when all the houses we built ourselves were scattered, plus the countryside is now cleaned of sewage from ponds, there are street lights at night, and the rural streets are very good, with the main roads in every village being concrete.” (Lin, personal communication, March 7, 2023)

On the other hand, the lack of offline learning facilities for rural older people, the shortage of full-time teachers for older people's education and the formalization of offline older people's education activities have prompted rural older people to choose social media as a practical form of learning. One participant noted, "we don't have a place for older people to learn in our village, this kind of thing is only available in the town, and there are too few people in our village" (Xiu Cai, personal communication, March 4, 2023).

Access to Educational Resources. Difficulty in accessing offline educational resources in rural China is an important reason why rural older people choose social media as a way of

learning, which is mainly reflected in the insufficiency of teaching spaces for older people, teachers and the fact that some of these spaces have been used for other purposes for a long time.

Some participants said that their village "has money but is not willing to build an activity centre for the elderly" (Tian Lu, personal communication, February 24, 2023), while others thought that "the village economy is not good and there is no money to build a place for the elderly" (Xiu Cai, personal communication, March 4, 2023), or that "the village attaches great importance to the learning of the elderly" (Lin, personal communication, March 7, 2023). From the different statements of the participants, it can be found that there is a difference in the degree of importance attached to education for the elderly by government agencies in different villages, and that the layout of education is not rational, coupled with the fact that the economic conditions of different villages vary greatly, and that most of the rural areas are economically very weak, which has led to a great imbalance of offline educational resources in the rural areas of each region.

One participant said that his village has a place dedicated to learning for older people, but that it is used very infrequently. The participant said:

“We have a place dedicated to activities and learning, but the unified organisation of learning is not that dense, and there are no special teachers, they are all part-time village cadres, and may only be available once in a few months, such as the popularisation of knowledge about epidemic prevention and the propagation of policies.” (Tian Lu, personal communication, February 24, 2023)

There were also participants who reported that the learning centre for the elderly in their village was being used for other purposes, with one participant saying, “there is an activity centre for the elderly, but we old women seldom go there, basically it's their old men who smoke and play cards in there” (Zhang, personal communication, March 24, 2023). In this environment of lack or appropriation of educational resources, older people are more inclined to choose learning options that are stable, accessible, and inexpensive.

Access to Educational Activities. In addition to the lack of hardware resources for education, the absence and formality of educational activities have prompted older people to choose to use social media for learning. A large number of learning classes are only available in cities, but public transport is inconvenient, so older learners are reluctant to spend significant time costs to travel to the city for classes even if they are interested in the course content. One participant noted, “I would love to attend this kind of learning class to learn a little more, but it is not available in the village, like our village is far away from the town, and a lot of the classes I know are held in the town, which is inconvenient” (Xiu Cai, personal communication, March 4, 2023).

The few existing courses that run in rural areas have old content and no full-time teachers, and are intended to meet the needs of inspections by higher government departments; such courses do not appeal to learners in rural areas, and more reason to choose to learn novel learning content on social media. An elderly person who regularly attends training courses stated:

“Sometimes there are training courses on pest control and drowning prevention, but most of them are just a formality, and they teach almost the same things every year.

The teacher is not a professional, is reading from a book, village cadres take a picture, about ten minutes to the end, not as good as I look at the content on Tiktok.” (Tian Lu, personal communication, February 24, 2023)

The singularity of rural offline teaching forms also prompted older people to choose social media for learning. Half of the participants believe that the current rural offline educational activities for the elderly are conducted in the form of meetings, which are very boring and long, and basically disseminate information in the form of lectures, with no teacher-student interactions or question-and-answer sessions, which is unattractive to learners. Some older people find that "the content of the course is mainly meetings, with one person from each family attending, which is very boring" (Xiu Cai, personal communication, March 4, 2023). Older learners are also unable to stick to long and boring offline courses due to the decline in physical strength after old age.

In contrast to the teacher led form of teaching, social media is rich in content and expressive, which provides a strong contrast to dull offline courses, Stimulated by this contrast, older people are very willing to fill their need for learning through social media. One participant said:

“Usually there are no training courses, and there is nothing for us to learn, you say that in a village like ours, Wuhan's economy is pretty good, and the village won't give you any calligraphy classes or any musical instrument classes. This kind of is our own old man or woman's own hobby, the village committee will not pay money to support us to learn.....then I was the first to start learning on Tiktok.” (Zhang, personal communication, March 24, 2023)

Family Situation. This element suggests that family members of rural older people have a facilitating effect on older people's use of social media for learning. All participants reported that at least one family member in their household uses social media for learning, and that older people generally have good relationships with other family members, and that children working in urban areas visit older people in rural areas frequently. One participant stated, "I have three children, all of whom use Tiktok and WeChat, and my youngest daughter works during the day and is staying with us at night" (Zhang, personal communication, March 24, 2023). In contact with their children, older people gradually discovered the advantages of social media for learning and became curious about social media, "I started by watching my daughter use Tiktok, and felt that the videos on it were very interesting, and she was willing to teach me, so I slowly used it" (Zhang, personal communication, March 24, 2023). Because of good interpersonal relationships in the family, children are also happy to introduce different social media to the elderly, and even due to the lack of public education, children take more responsibility for teaching the elderly to use social media for learning. One participant noted:

"I live with my youngest son's family, he works a bit far away, in town, it takes more than an hour to drive, so he comes back once or twice a week, usually on weekends for a break. My daughter-in-law and her family work is just early in the morning and late at night, and they come back every day. I'm very close to all of them, and my granddaughter taught me how to use Tiktok. " (Xiu Cai, personal communication, March 4, 2023)

The needs of their children were also a strong driver for older people's use of social media

for learning, with two participants reporting wanting to use social media for learning because their children wanted to eat a particular specialty flavour of cake or wanted to travel somewhere, and the relevant information was most detailed on social media. For example, one participant reported:

“My daughter saw people making cakes and other desserts on Tiktok and wanted me to make them for her. I don't know how to make a cake, so I had to learn how to use Tiktok to see how pastry chefs make cakes. The first time I made a cake it wasn't good and then I had to open Tiktok to watch their videos again.” (Zhang, personal communication, March 24, 2023)

The sense of fulfilment generated by being needed by their children motivates older people to start using social media to learn.

Social Interaction. As their age rises and their physical strength declines, many rural older people are in a state of having a lot of free time and being bored in their daily lives, with their land leased out to large enterprises, without the need to work and without the pressure of a family. They think, “our land has been leased out, we collect a little rent every year, and we usually just rest at home, which is also a bit boring” (Lin, personal communication, March 7, 2023). However, children are in their middle and prime years and are under multiple pressures and cannot always be with their parents, so socializing becomes a very important way for the older age group to spend time in their later years. Some participants reported spending the whole afternoon or evening socializing, he said:

“I often find friends to chat with in the afternoon, we usually talk more about news,

all the news we see on WeChat, and also about things in our lives, such as how to raise fish, who raises fish well, who has more fishponds, who has planted what on their land, how much they earned last year, the situation of foreign investment this year, and so on.” (Lin, personal communication, March 7, 2023)

As mentioned above, the role of family members in facilitating rural older people's use of social media for learning, many rural older people have also started to use social media for learning on the recommendation of their family members, and the rich content of learning in social media has gradually become the main topic of communication when older people socialize. One participant explained, “I do like to talk to my friends about new things on Tiktok, mainly because it's also more interesting and we can talk for a long time.” (Zhang, personal communication, March 24, 2023)

Older people who have not yet used social media to learn at this time can feel that the knowledge and learning they have accumulated through traditional learning methods are not enough to communicate with their friends. In order to solve this embarrassing status quo of having no topics to chat about in socializing and to avoid isolation due to a lack of knowledge, older people likewise choose to use social media learning in the hope of becoming a member of the social group again. One participant said, “sometimes chatting I don't know what people are talking about, they let me open Tiktok to look at it, and then I got to know it when I watched more” (Xiu Cai, personal communication, March 4, 2023). After using it themselves for a period of time, they found that using social media learning expanded their interpersonal communication topics and enabled them to achieve interpersonal satisfaction, thus successfully transforming

themselves from a bystander to a participant, who would then use their own learning content for content output in their social circles, carrying out a virtuous cycle of self-satisfaction. Afterwards, they will use their own personal experiences and feelings to influence the attitudes of people around them towards using social media for learning, so that more potential social media audiences become actual audiences. Participants were generally satisfied with their social outcomes:

“I was the first one in our village to use Tiktok for learning, and then my friends saw me using Tiktok and found it interesting, so they started using it together. I'm in our group of friends, and they say I'm the newest, and I'm pretty happy that I can teach them how to use Tiktok.” (Zhang, personal communication, March 24, 2023)

Personal Reasons for Older Persons

Personal reasons for older persons are objective and subjective reasons related to older persons themselves. For example, in the development phase of learning behaviours, in addition to social factors, the individual's willingness to learn and personal preferences are very important internal influences. Individual foundational conditions play an important role as the use of behaviour. In terms of willingness to learn, the interview results show that the rural elderly who eventually produce the learning behaviour of using social media have a relatively strong willingness to learn, and after receiving the impetus of family members and interpersonal circles, the elderly themselves have a positive attitude towards learning social media and are willing to pay a certain amount of time and energy to learn.

In terms of personal hobbies, the elderly have their own unique hobbies, curiosity and

strong interest in all kinds of things, but there are few places and organisations that can satisfy their hobbies in real life, while the content of social media has no time and place limitations, and is rich in content, with a wide range of content, which can satisfy almost any personal hobbies of the elderly, and can be seen anytime and anywhere when picking up the mobile phone, which is a good way to learn about social media for the elderly. For older people, using social media to learn can satisfy their personal hobbies, which also contributes to the learning behaviour.

Leisure Time. At present, the average life expectancy in rural China is gradually increasing, but there has been no major change in the retirement age. Even if we calculate according to China's current maximum retirement age of 60, the elderly will not have to work for at least 15 years, and this time will be even longer for the rural elderly. In the face of more than 15 years of leisure time, how to find a way to spend time comfortably has become a very important goal for the rural elderly in their later years (State Council of China, 2022).

Among the various leisure activities, using social media for learning is undoubtedly one of the best ways to spend time. First of all, the participants believe that using social media to learn for a long time does not have significant side effects, but rather enriches their knowledge base. One participant said, “my friends sometimes go to play cards when they are bored, I don't like that, sitting for too long is not good for my health and a waste of money, I just watch the news on Tiktok when I am bored” (Xiu Cai, personal communication, March 4, 2023). Secondly the vast majority of the learning content is free and does not cause a financial burden through prolonged use. One participant said, “this software like a platform where everyone can share stuff, it doesn't cost anything either, just have internet” (Tian Lu, personal communication,

February 24, 2023). Finally social media learning content is rich and immersive, accompanied by accurate algorithmic recommendations of big data, it is easy for the elderly to have emotional resonance and devote themselves to learning, forgetfulness of learning brings about the blurring of time, and by the time they realize it, “hours have gone by” (Tian Lu, personal communication, February 24, 2023).

Past Experiences. Rural older people's earlier learning experiences and experience of using social media guided their use of social media for learning and made it less difficult. Most of the rural older adults who used social media to learn had richer learning experiences and life experiences than their peers, and they sometimes moved to the city to work in their youth or middle age, which exposed them to more advanced learning styles and made them more aware of the impact of different learning styles on learning outcomes. One participant recalled: “I was supposed to be a knowledgeable and educated person in this age group, and although I came from the countryside, I was always in touch with the international community and knew how to learn. I also had access to computers at that time” (Tian Lu, personal communication, February 24, 2023).

In their early learning experiences, it was often mentioned that they used computers and search engines to learn while their peers used books and television to learn. One participant stated, “I mainly read books in the beginning, and when Baidu was available later I used computers to learn, and only later did I have social media as you said, and I quite like to be exposed to new learning channels” (Tian Lu, personal communication, February 24, 2023).

There were even rural older people who had been exposed to and used social media from a

very early age, only that they did not use social media as a learning tool, but as a tool to liaise with others. One participant said, “I started to use QQ before I retired, but I didn't know it could be used for learning at that time, and then I became more proficient in using it when I learnt about it” (Xiu Cai, personal communication, March 4, 2023). So at the level of personal experience, rural older people who use social media for learning have greater curiosity and richer learning experiences, which makes them motivated to learn new ways of learning and receptive to the newness of social media.

Health Conditions. The generally good health of rural older people provides a good foundation for using social media for learning. As described above, the infrastructure in rural China is now generally good, with plenty of fitness equipment and squares for older people to exercise and walk. One participant used to walk every day: “I really like to get up and go for a walk outside, I'm getting older, I'm getting up earlier, I used to get into the habit of doing it, so I'm still relatively healthy.” (Lin, personal communication, March 7, 2023). In rural areas, “there are small clinics that provide medical services” (Lin, personal communication, March 7, 2023), and these infrastructures have been effective in improving the health of older people in rural areas. The health status of older people is also related to their use of health services.

The relationship between older people's health and their use of social media for learning is a mutually reinforcing one, with the healthier older people being more likely to stay active for longer periods of time. The healthier the older person is, the longer they can use social media to learn without physical or mental fatigue, and the more time they have at their disposal to use social media, whereas those who are not healthy enough to use social media have to compromise

their health and give up using social media to a certain extent, and the healthier the older person is, the more they will be hindered by the outside world. For example, one participant said: "My health has always been good, but my eyesight is not so good now, and my eyes feel uncomfortable when I look at QQ or WeChat for a long time" (Xiu Cai, personal communication, March 4, 2023).

Ideology. Ideology in this paper refers to the participants' evaluation and behavioural tendencies towards social media. It is a relatively enduring and stable individual tendency that can usually be judged and interpreted in terms of the learner's attention to learning, affective tendencies and willpower. Older adults are in a typical informal learning environment in the process of using social media for learning, and theoretically older adults' attitudes towards social media can significantly affect their use behaviour. And the learning attitudes demonstrated by the participants in the interviews were quite positive, they showed a very strong curiosity about using social media for learning, as well as a strong sense of social responsibility and dedication. One participant commented, "I like to contact new things since I was a child, like Dyson's Hoover was also the first thing we started to use in our family, and I used Baidu when there was no social media, which was still relatively trendy at that time" (Zhang, personal communication, March 24, 2023).

The rural elderly also showed their adaptability to new things, one person said: "Now life is still in general better than in the past day by day, but I have to adapt, my adaptability is very strong, and I don't resist new technology and new knowledge" (Lin, personal communication, March 7, 2023). They also have a strong sense of social responsibility and dedication. One

participant said:

“I like to look at things from a developmental perspective, everything develops and changes slowly, like social media too, we need to keep up with developments so that we can keep our thinking advanced and not be eliminated by society” (Xiu Cai, personal communication, March 4, 2023).

Personal Preferences. The needs of rural older people for learning content and forms of information delivery present a very rich set of personal characteristics. Each learner had different preferences for learning content, for example there were learners who preferred to learn about embroidery, dancing and cooking, and learners who preferred to learn about the military, politics and sports.

A participant commented, “I found out that there are a lot of social media videos that teach you how to cook, teach you how to raise flowers, and there are a lot of health videos and travel videos, which I like to watch” (Zhang, personal communication, March 24, 2023). There were also male participants who commented, “I hope it (social media) can deliver some international news to me in a timely manner because you know I used to learn with the newspaper, and this is too slow, some things happen internationally and it takes a few days for the newspaper to publish it, and that's inconvenient” (Xiu Cai, personal communication, March 4, 2023).

Almost every participant had a different preference for the form of information delivery, ranging from rural older people who preferred text to those who preferred audio, video or pictures. Some participants “like to see graphic information the most, so I use WeChat, which does a good job with graphics” (Tian Lu, personal communication, February 24, 2023). A large

part of the reason why they choose social media as a learning tool is because it is the only medium in the rural environment that can fulfil such complex and rich learning needs at the same time, making it possible to move away from the huge variety of newspapers or expensive training courses. A participant statement:

“I use it (social media) to learn chess, the training courses have to be adapted to the area where they are located, for example there are more people playing chess in this area, more people playing skipping rope in that area, and there are a lot of things it teaches that I am not interested in, not as free as these social media.” (Lin, personal communication, March 7, 2023)

Experiences

The experience section states the social media platforms mainly used by rural older adults and the three behaviors related to learning that arose during the learning process. The participants' choices of learning tools and various behaviors of using social media for learning fully demonstrate the characteristics of rural Chinese older adults. The elements included in the main category of reasons are learning tools, family members, help from friends, help from colleagues, usage habits, purpose of self-development, interaction purpose, external information needs, entertainment purposes, health purposes, intergenerational interaction, group interaction and one-on-one interaction.

Learning Tools: Social Media Platforms

Learning tools in this section refer to social media platforms specifically used by older adults. In participants' reports, they indicated using a variety of mobile phone-based social

media platforms as learning tools in a variety of times and spaces. Of the participants, 100% reported that when wanting to use social media for learning, “the one used the most is Tiktok” (Zhang, personal communication, March 24, 2023). QQ was mentioned by three participants, which is more than half of the sample. One participant said, “one of the most used is QQ, which is mainly for leisure time checking.....the other one is WeChat, and I read more graphic news on WeChat” (Lin, personal communication, March 7, 2023). Other social media platforms such as Wechat, Xiaohongshu and Kuaishou were also mentioned as being used for multiple learning information access. Participants who used a variety of social media as a learning tool said, “mainly nowadays, I use Wechat and QQ most for information, and Tiktok and Xiaohongshu for learning” (Tian Lu, personal communication, February 24, 2023).

Older people's use of social media platforms on their mobile phones allows them to access and share information of interest anytime, anywhere, and allows them to quickly and easily switch between different learning content, with common actions such as watching learning videos, reading graphic information, listening to audiobooks, and sharing files and links. The most commonly mentioned platforms are Tiktok, QQ and Wechat.

Social Media Platform - Tiktok. Four out of four participants reported using Tiktok as a learning tool, and Tiktok was also the learning tool they used for the longest time every day. They said, “there are a lot of different people commenting on the same content on Tiktok, and I can get perspectives on multiple aspects of the same event on it” (Lin, personal communication, March 7, 2023). Unlike the use of QQ and WeChat, the participants started using Tiktok as a learning tool based on their own learning needs, and it was a proactive exploratory behaviour.

Tiktok is a video-centric social media platform, and most of the videos are less than 1 minute in length. The video content sent by users relies on the Tiktok software, and the video content is characterised by rich variety and quantity.

The richness of Tiktok's video content fits the older learners' pursuit of learning fresh content, especially for the elderly, Tiktok's simplicity of switching videos by just sliding the mobile phone screen can make it easier for them to devote themselves to the video content, and the wide variety of video content can satisfy the learning needs of older people in different rural areas, and the curiosity of what will be the next one will make the older people's active. The curiosity of what will be next allows for the full development of active learning behaviours. Participants said, "I use Tiktok the most, mainly because it's more convenient and you can watch the next video with a swipe of your finger on the screen" (Tian Lu, personal communication, February 24, 2023).

Tiktok's screening of videos based on big data is also very accurate. After the participant receives very rich learning content by using tiktok at the beginning, Tiktok will push video content that is more in line with the participant's interests based on the browsing data, and the participant will also collect, like, and other buttons to proactively screen out their own learning content interest network, and use the attention button to track the video content that matches their interests with a single click. content that matches their interests using the follow button for one-click tracking.

A participant explained, "Tiktok is just very simple, it doesn't require any complicated operation, you just need to click it to collect your favourite learning content" (Xiu Cai, personal

communication, March 4, 2023). The filtered video content fits the points of interest of the older adults, for whom the quality of such videos is selected by themselves and matches their usage habits and personal preferences, and thus will be easier to enter into a prolonged learning state. A participant said, “Tiktok does a great job of basically pushing content that interests me, and if I see a video I like, it's easy to like and favorite it.” (Zhang, personal communication, March 24, 2023).

Social Media Platform - QQ. Three of the four participants reported using QQ as a learning tool, the most commonly used social media software in China. QQ was born as a simple information communication software, and has since evolved into a variety of information dissemination methods such as graphic, video, and live broadcasting. Participants commonly started using QQ because they had a need to communicate with people at work or in their lives. Two participants indicated that learning to use QQ was mandatory for their companies, which had special courses to instruct participants on how to communicate with QQ customers, which was a kind of forced use based on work demands. They stated, “I started to use QQ because the company trained me to use QQ to communicate with customers” (Tian Lu, personal communication, February 24, 2023).

After participants discovered QQ's learning function, it gradually transformed into active learning behaviour, but participants generally did not have a good impression of QQ as a learning tool. One participant stated, “later I found out that QQ still has a learning function, but it is full of official information from companies or organisations, and there is nothing personally posted, so it is not interesting” (Tian Lu, personal communication, February 24, 2023). The

main reason for this is that QQ is essentially an instant messaging-based communication tool, and although it attempted to diversify in a later stage, it did not focus on improving the learning function. A participant described: "QQ is still mainly used to communicate more, learning rarely use QQ, its learning part is not well done, very messy, and sometimes lagging" (Xiu Cai, personal communication, March 4, 2023).

At present, the majority of the diverse content in QQ is information released by various companies or organizations, with very little sharing by individual users, which leads to a poor learning experience due to overstuffed content and lack of software maintenance. One participant described his learning experience: "I learnt to play chess on QQ, but the problem with QQ is that the chess section is so hidden that I often can't find it" (Lin, personal communication, March 7, 2023). Participants will use QQ to watch free courses offered by certain organizations, but they will not spend a lot of time learning on QQ due to a variety of issues.

Social Media Platform - WeChat. WeChat is a social media software similar to QQ and belongs to Tencent just like QQ. Either individuals or businesses or other social organizations can apply to register for a WeChat public number, and individuals or collective enterprises can send different types of content to their public numbers, such as text, images, sound and video. One participant really liked the learning function of WeChat:

"I think the best thing WeChat does is its public account, everyone can express their own opinion on it, and it can also combine text and video, sometimes the text can't say things clearly look at the video to know what's going on." (Tian Lu, personal

communication, February 24, 2023)

WeChat provides users with personalised services so that they can search, read, save, share forward various texts, audios and videos according to their personal interests, and add friends and WeChat groups to make calls through the WeChat platform. A participant said, “one good thing about WeChat is that it's very easy to forward, and the interface is simpler than QQ, so when I see learning content I'm interested in I can immediately send it to others to share” (Tian Lu, personal communication, February 24, 2023). Elderly learners access graphic and video information through WeChat in their daily lives. Compared to Tiktok, which focuses on video content, WeChat is more specialised in textual content, and is the first choice for participants to access textual learning content. Compared to QQ, WeChat is simpler to operate and has a clearer page layout, making it suitable for older people's usage habits.

Learning Behaviors

Learning behaviors are behaviors in which participants learn to use social media as a learning tool. Rural older adults are in a social life and are able to receive some support and help from many sources. In terms of older people learning to use social media as a learning tool, according to participants' reports, family members are the main supporters of older people's learning, and all participants received strong support from family members. In addition, more than half of the seniors learned with the help of friends. In addition, half of the participants reported that they initially started learning to use social media because of company training or help from colleagues.

Family Members. Family members are generally the closest people to older adults.

Participants in this study generally reported that their family members believe older adults should learn to use social media. One participant commented, “my family members support me in using Tiktok, they think it will allow me to keep up with social development” (Xiu Cai, personal communication, March 4, 2023). Family members of rural older adults viewed using and learning through social media as a necessary skill for modern life or viewed learning through social media as an important way for rural older adults to learn to keep their brains flexible and their minds up to date with changes in a relatively closed environment such as a rural village.

With this unified consensus, family members of rural older adults supported older adults' learning to use social media for learning in a number of ways. One of the strongest supports was spending time with the older adult learning. Participants' family members offered to provide dedicated time to spend with the older adult or to do activities together, and during these times the family members taught the older adult how to use social media and how to search for learning materials of interest to them. One participant reported that his family member was highly educated and would provide easy to understand explanations for older adults along with hands-on instruction. One participant provided his process for learning to use social media:

“I was a little bit interested in this (social media), so I went home and asked my granddaughter to help me, and she helped me install the software on my mobile phone, registered an account for me, and then taught me how to use it, first of all, the ways I can find the areas I am interested in, and then how to search for it, how to save the videos that I am interested in, and how to follow other people's accounts.” (Xiu

Cai, personal communication, March 4, 2023)

Different families help older people in different ways, and some family members only teach older people the basic operation of the software, and subsequent use relies on older people's own exploration. One participant said: "You know older people are slow to accept the software, I had no idea how to operate it, then I asked my daughter to know the basic operation, and then later on I slowly explored it on my own" (Tian Lu, personal communication, February 24, 2023). Due to the deterioration of the memory of the elderly, there are many operations that cannot be learned only once to reach the standard of being able to skillfully use the software to learn, and the follow-up support of family members is also very important. However, the attitudes of family members diverged from here on, and the approach and attitude of family members could visually reflect their level of support for the older adults when they repeatedly asked and sought advice on the same issues.

Most of the participants indicated that their family members are aware of the need to be more patient when dealing with older adults, but nevertheless there are moments of impatience in their specific actions. For example, one participant stated, "I use Tiktok because my daughter taught me by hand, we are older, you don't teach us at first we definitely won't be able to do it, and sometimes you may have to teach us a few more times, it's like collecting a video and asking my daughter to teach me three times, and then she said that I am so stupid" (Zhang, personal communication, March 24, 2023).

In addition to guiding older people in their learning, some family members also provide financial support for older people, which is usually in the form of a contribution to pay for a new

smartphone, etc., or the purchase of a mobile phone subscription for older people, or the provision of Wi-Fi in the home. Analysis of the interview texts revealed that participants had different views on financial support for older people's use of social media for learning, based on their own and their family's financial situation. Some participants felt that they did not lack the funds to buy a smartphone, but that the help from their family members made them feel a positive attitude, representing their family's approval of their learning behaviour. For example, one participant stated, “my children are very supportive of my use of this (social media) and said they would buy me a iPad to use it comfortably” (Zhang, personal communication, March 24, 2023).

Help From Friends. Two participants reported that they had received help from friends in learning to use social media, but the help from friends appeared to be more limited than the help from family members. There are two main reasons for this, the first being that older adults do not spend enough time with their friends. In the limited time spent together, older adults and their friends have a lot of information to share, and they cannot manage to set aside dedicated time to ask their friends for advice on problems encountered in using social media for learning, and naturally, their friends do not have the time to provide hands-on guidance as family members do. A participant stated, “My friend taught me some basic operations, and we are not together every day, so I may ask for advice on how to operate it sometimes when I come across it” (Lin, personal communication, March 7, 2023).

The second is that older people themselves are reluctant to seek too much guidance from their friends. One participant commented, “I don't want to take up too much of my friend's time,

after all, we all have our own work, and always looking for others to ask questions looks like I don't know anything” (Tian Lu, personal communication, February 24, 2023). Because of the trust and closeness between family members, when spending time with family members older adults were more willing to expose their shortcomings in using social media for learning. However, when spending time with friends, it was difficult for older adults to state the difficulties they encountered due to self-esteem.

The help provided by friends focused on online safety, and participants' friends, who were generally pioneers in using social media for learning or had experience of using social media, would teach older people what they themselves considered to be the most important aspects. There were friends who would instruct older adults on how to fill out personal information on social media to prevent potential information leaks. There are also friends who will instruct older adults on how to safely purchase items through social media. One participant who had received help from his friends said, “they mainly told me not to believe the adverts on WeChat and Tiktok and to buy less on them for fear that I would be deceived” (Lin, personal communication, March 7, 2023).

Help From Colleagues. Colleagues are the best teachers that older people can look to during working hours, with two participants reporting that they had sought help from colleagues, stated “sometimes I ask my colleagues questions, but some of my colleagues of the same age do not know how to operate these social media themselves, and younger colleagues do not feel that they have anything in common” (Tian Lu, personal communication, February 24, 2023). The help provided by co-workers mainly focused on guidance on basic software usage, as

co-workers' guidance was often based on work requirements. A participant said, "Looking for colleagues is still mainly based on work needs, for example, I often use Excel or Word at work, and if I don't know how to operate some functions, I ask my colleagues, and they teach me how to search for solutions on Tiktok" (Tian Lu, personal communication, February 24, 2023).

Work's need for social software is mainly focused on communication, so colleagues' help is limited to ensuring that older people are able to use the most basic communication functions and search functions of social media, and only if older people make further enquiries will they be instructed in a very short period of time on how to use social media to learn. One participant stated: "I was taught how to use QQ and WeChat by a colleague, there was no Tiktok at that time, and my colleague just taught me how to use QQ and WeChat to communicate with my clients, which were the most basic operations, and I did everything else on my own" (Xiu Cai, personal communication, March 4, 2023).

Usage Behaviors

Usage behavior refers to how rural older adults use social media to learn, and this section is the focus of this study. In this section, the usage habits of the participants using social media for learning are demonstrated, while the different learning purposes of the participants are analyzed.

Usage Habits. Habits of use as described in this study include the length and frequency of social media use for learning by rural older adults. Older people use social media to learn more frequently and for longer periods of time than other traditional ways of learning (e.g., books, television). According to participants' reports, two retired older adults and one older adult who was not working had enough free time to learn, resulting in a general "learning time of more

than four hours per day” (Xiu Cai, personal communication, March 4, 2023). One participant reached “six hours a day” (Zhang, personal communication, March 24, 2023). Even the only participant who had a job spent two hours a day using social media to learn. He said “I still have a job, so I definitely take care of my work first, and outside of work hours, I take out my mobile phone to look at it and turn on Tiktok to learn” (Tian Lu, personal communication, February 24, 2023). However, older people basically do not study continuously for more than an hour, and long continuous study can lead to visual fatigue in older people, so the longer study duration is a result of shorter single study duration and higher study frequency.

In terms of frequency of study, all but one participant generally did not have a fixed time to study, and often older people took out their mobile phones to use social media platforms to start studying when they wanted to keep up with the news or when they wanted to learn about specific content. One participant said, “There is no fixed time, I open my mobile phone to look twice when I want to, for example, this morning when I came back from my walk, I wanted to look at the news about pension reforms, so I opened Tiktok and searched for this kind of news” (Xiu Cai, personal communication, March 4, 2023). Relying on the convenience of social media software, older people can start studying anytime, anywhere, with known study times such as after waking up, before a lunch break, after exercise, after dinner and before going to bed. This has also led to a very high frequency of daily study among older adults, with all participants studying more than ten times per day. The participant with the highest learning rating stated, “Generally, I check Tiktok it first as soon as my mobile phone is turned on, and I have not counted the frequency of use.....estimated to be more than 20 times” (Lin, personal

communication, March 7, 2023).

Fulfilment of Self-Development. The fulfilment of self-development needs is a very important part of the use of social media for learning by rural older people. For example, one participant wanted to develop her cooking skills:

“I like cooking very much, and I want to improve my cooking, but it turns out that I can't find a place to learn, and there are no places in the countryside that teach cooking, so now I use Tiktok to watch other people's instructional videos, and it's just right for me to improve my cooking” (Zhang, personal communication, March 24, 2023).

As we mentioned above, participants generally have a strong curiosity and active learning ability, which makes them want to achieve self-development even in their old age. At the same time older people have strong spiritual needs, they do not want to disengage from society and want to continue to realise their self-worth, which is going to motivate their desire to achieve self-development through the use of social media for learning. A participant stated:

“I hope that I can make a little progress every day, at least not regress, for example, I am now learning to practise my handwriting by watching videos on social media, and of course I hope that every day my handwriting can look better, so that I can feel proud of myself when everyone invites me to write spring scrolls for the Chinese New Year” (Lin, personal communication, March 7, 2023).

This participant's views express his desire for self-development and social media is an important tool for him to achieve it.

Interaction Purpose. Rural older people have a strong need for socializing because of their own loneliness and closed social circles. Socializing has become an important part of the use of social media learning for the elderly, and older groups receive a large amount of information through the use of social media learning, but they do not accept all the learning content, but rather screen and absorb the learning content in a timely manner according to their social needs. In this way, the learning content and topics that can be used for socializing can be fully learned, so that the content can be outputted in the next socializing, which can fully expand the content and topics of interpersonal communication. A participant said, “I like to use WeChat to read some international news, these things are useful when chatting, a lot of news other people don't know, just I know it, so I feel that I am very dignified, and I know more than other people” (Tian Lu, personal communication, February 24, 2023). Learning through the use of social media can not only integrate into the social circle, but also enable the elderly group to grasp a certain discourse in social interaction, and gain a sense of satisfaction in interpersonal communication.

On the other hand, due to the learning content recommendation of social media platforms, different older people will also receive personalized information exclusively for him, and this part of the information enables older people to present, communicate and interact with the content in their own hobby social circle, so as to fully demonstrate their own learning achievements. One participant said: “Learning with social media has given us themes for chatting, I used to chat with my friends about trivial things in the countryside, but now we can

talk about the news as well” (Zhang, personal communication, March 24, 2023).

In addition to accessing social topics, older people also want to gain more friends through social media. Rural elderly people's real social circle is very limited, but also with the decline of physical function is difficult to make new friends in real life, and social media as a medium to connect the two sides. The algorithmic recommendation system of social media can be seen to allow the elderly to see people who have the same learning interests as themselves in the process of learning, and they can communicate about the learning content through social media. A participant said:

“I think it's good to use these social media to make friends, I open a learning video of interest like to see other people's comments, some of which I think make sense to contact them through QQ or WeChat, and a few more times to become friends.” (Lin, personal communication, March 7, 2023)

In the long-term communication and exchange, the friendship circle of the elderly gradually expands, make up for the lack of real-life friends, have more friends on the network, to achieve the satisfaction of the social needs.

External Information Needs. As mentioned above, the relatively closed environment in rural areas leads to a closed social circle and access to information for the elderly. Rural older people “want to use WeChat to read the news” (Tian Lu, personal communication, February 24, 2023), and they used to be able to “subscribe to newspapers to read the news” (Lin, personal communication, March 7, 2023), but “there are fewer newspapers now, so we need to find a new method to read the news” (Lin, personal communication, March 7, 2023).

Although living in a closed environment, the rural elderly group still has a high desire for information from the outside world, they want to understand the outside world and know what is happening in society. One participant stated, “rural areas are still relatively closed, we chat about what is happening in the village, I want to know about some new national and international events, it is easier to use WeChat or Tiktok” (Lin, personal communication, March 7, 2023). Even if these participants know that learning about the news may not affect them or that they cannot contribute in any way, they want to have the right to know.

Social media is rich in learning content and provides access to “up-to-date information in various fields” (Tian Lu, personal communication, February 24, 2023) in a short period of time. Although much of the learning information is fragmented and not coherent or connected, it is sufficient for older adults who want to quickly access information in multiple fields.

Entertainment Purposes. Rural older people do not learn all the time when they use social media, subjectively older people watch a lot of entertaining content through social media and they do not see it as a learning behaviour. One participant stated:

“For example, speaking of when I'm tired or drinking too much today and lying on the sofa, I want to watch a video on WeChat, read an article for entertainment, and then read the comments of the people who watch it with me to learn something new.”

(Tian Lu, personal communication, February 24, 2023)

For the elderly, the use of social media is not only able to spend time, but also lies in the fact that there is a category of information provided by social media that matches their hobbies, and they are able to obtain great entertainment satisfaction by watching these contents that

match their hobbies. They “sometimes don't want to study, they just want to find some interesting videos to watch”, such as “where the blogger has travelled again, what is the beautiful scenery, or what delicious food someone has made” (Zhang, personal communication, March 24, 2023). Older groups will click to follow their favourite content when it first appears, and keep track of the subsequent developments of the video publishers they are interested in, and personal preference plays a big role in this process.

But objectively speaking, the learning behaviour has already been generated, only that the older adults are not aware of it. This is in line with the characteristics of informal learning, i.e. in some cases a non-interventionist, unconscious learning behaviour, as well as the interests of the learners. One participant reported that he liked to listen to the news of the day via social media before going to bed for personal interest and entertainment purposes, and that his subjective awareness did not think he was learning, nor did he remember the news at all. He said, “At the time I couldn't remember all this news, but I knew what it was about when people talked about it” (Lin, personal communication, March 7, 2023). But the fact that later on when socialising with people he could use different news content as a topic of conversation was an unconscious learning behaviour. Feedback from this participant: “I didn't want to learn but now that I think about it I have learnt something” (Tian Lu, personal communication, February 24, 2023).

Health Purposes. Enhancing one's mental health and physical health is one of the purposes of social media use among rural older adults. In terms of mental health, participants believed that using social media to learn could relieve their loneliness and exercise their thinking skills. Participants generally believed that their ability to think declined in old age compared to young

age, and that learning through social media could expose them to a wealth of diverse knowledge in a short period of time, and that the learning process was often accompanied by thinking. Older people can exercise their thinking skills while learning, which can effectively maintain the mental health of rural older people. One participant stated:

“I now realize that when I was younger I felt like I had a good brain, now I can't remember phone numbers, it's the memory loss that comes with old age, but when I learned to use social media, what I wanted to learn about I searched for everything right away, and the process of learning exercises my memory.” (Tian Lu, personal communication, February 24, 2023)

Loneliness was a word often mentioned by the participants. Most of the children of the rural elderly work in the towns and cities, and although they can often come back to visit the elderly, they cannot stay with them for a long time, so the elderly who stay alone in their villages become the left-behind elderly. The slowness of thinking and the coldness of the family environment due to the absence of children aggravate the sense of loneliness of the elderly. One participant cited his own friends as an example: “I have a lot of friends whose kids don't come home much. They have kids who are out of town, so they feel lonely too, and the older they get, the more afraid they are of being alone” (Zhang, personal communication, March 24, 2023). The participant said:

“I was bored at home alone during the day, but after using social media, life is not as boring as it used to be, and you feel that you are useful when you get older, because when you get old, you are afraid of becoming a burden to your children.” (Zhang,

personal communication, March 24, 2023)

In order to dissipate this sense of loneliness and have a spiritual support in their daily lives, the elderly hope to learn to enrich their lives through the use of social media. The richness of information and the ability to communicate with others that is unique to social media allows the elderly to immerse themselves in learning, and the participants felt that even if they didn't watch a video while walking, or just left it playing automatically, it was as if they were surrounded by a companion. One participant described an improvement in mental wellbeing after using social media as a learning tool:

“I teach them to use Tiktok to learn after obviously you can feel them much happier, chatting about more topics, because you know before the rural women, she talked to talk about is gossip, and now we talk about personal interests, people are also cheerful, the state of mind than a few years ago to be too good.” (Zhang, personal communication, March 24, 2023)

Rural elderly people also attach great importance to physical health, the elderly with age will lead to a gradual decline in mobility, some elderly people also have physical disabilities or suffer from chronic diseases in old age, the amount of exercise brought about by living has made it a bit difficult for them to bear, and they are unable to carry out other physically demanding activities, which makes them want to urgently improve or maintain their own physical health status. The current approach taken by older adults is to search social media for a variety of wellness methods and gentle exercise routines, and they feel that following the guidance of

exercise coaches on social media has been effective in improving their physical health. One participant stated:

“I think social media is very suitable for us older people to use, like I am getting older, my body is not as good as when I was younger, I follow some bloggers who teach older people about fitness on Tiktok. They are all professional trainers, he teaches you these things on very many different movements, these aspects are much richer and better than this kind of TV and Baidu.” (Zhang, personal communication, March 24, 2023)

Interactive Behaviors

Interactive behavior refers to how rural older learners interact with other learners in the process of using social media for learning, which mainly includes three aspects: intergenerational interaction, group interaction and one-to-one interaction.

Intergenerational Interaction. Intergenerational interaction is the most common form of interaction in the use of social media learning by the elderly, and the objects of intergenerational activities are generally the children and grandchildren of the elderly, which is manifested by the fact that the elderly will share the learning contents they are interested in or those that may be useful for their descendants to their children and grandchildren through the sharing function of social media, and discuss and learn together with them. One participant was proud of the results of his intergenerational interactions using social media, he stated: “I've now trained two of my nephews to write through social media, and I forward them calligraphy or chess tutorials I see on Tiktok that interest them” (Lin, personal communication, March 7, 2023).

Families in rural China generally have a very strong sense of family, in which older people, as elders, can command full respect within the family and the family as a whole, and family members perceive older people as having richer experience. Based on this, when older people share what they are interested in learning with other family members, they mostly reap positive responses, and young people are happy to discuss topics such as politics and economics with older people. Some participants said:

“We all influence each other in our family, for example, our family members set up a group chat in WeChat, we can we can share the news we are interested in with each other, and sometimes if there is something we don't know how to do, we can also ask our children directly in the group, and they are also very active in discussing with me.”

(Tian Lu, personal communication, February 24, 2023)

For young people this kind of exploration is also a form of companionship for older people, who do not explicitly reject the discussion even when they encounter topics that do not interest them. For older people, this form of intergenerational interaction and the positive response of their offspring gives them positive feedback. Older adults felt that through this kind of sharing and discussion they could highlight their value in the closest relationship of family members and were more willing to invest more time in using social media to learn. One participant “likes to share cooking videos with the kids” and if “they are interested I will cook for them”, the recognition from family members “is also very happy for me and I will feel that I am useful even when I am older” (Zhang, personal communication, March 24, 2023).

Group Interaction. Social media provides a platform, resource and environment for group

interaction and team learning for older people. Group interaction among rural older people is achieved through social media group chats, which are a very personalized form of interaction in which a large number of learners who are interested in the same learning topic or at the same age level are gathered in each group chat. Older people would send their own learning content of interest to other learners through the group chat to start a conversation, and other learners in the group chat with the same interest would also participate in the discussion and learn together. One participant commented, “It's more interesting to discuss the learning content in a developed group chat than to learn alone, especially now that the software is doing a good job, and it's very convenient to annotate on the same document, which can be seen by everyone in the group” (Lin, personal communication, March 7, 2023).

Older learners have accumulated a great deal of experience in their previous learning and work, and the process of group interaction and team learning allows older people to show their elders' demeanour, to play to their strengths in social media, to discuss with each other and to make progress together, and to gain a sense of satisfaction and self-worth from this. A participant explained:

“Because the news on social media are relatively new, I can share them with my friends in group chats, so that no one knows about it but only me, and it is very fulfilling. Now a lot of my friends have also downloaded Tiktok on their mobile phones, so we often discuss it together in the group chat and there are more opportunities to connect.” (Xiu Cai, personal communication, March 4, 2023)

In group interactions, there are many people of the same or different age groups as older

people who are participating in the same or different types of online collaborative learning activities, which not only requires older people to have the ability to build and maintain their own learning resources, but also the ability to communicate and share common learning resources. A participant said, “I also added some local group chats and often watched them posting some life skills in them, but at first I didn't know what to send the learning content to the group chats, then I learnt it on Tiktok, and after I learnt it I posted a lot of things in the group chats as well” (Tian Lu, personal communication, February 24, 2023). This suggests that growth in older people's digital skills can also be fostered in group interactions.

One-on-One Interactions. One-to-one interaction is a less frequent form of interaction for older people using social media for learning, with one participant stating that he would interact with the disseminator of the learning content or an older person with a common interest in the private chat room provided by social media. He said, “I like WeChat to contact individually, I like to discuss individually, for example, some learning materials I send to you, you send to me, I think it is also quite efficient and targeted” (Tian Lu, personal communication, February 24, 2023).

Another participant stated that she was happy to interact one-on-one with the purveyors of learning content, but because a content purveyor has to deal with a large audience on social media, it resulted in her not having the opportunity to communicate with the content purveyor. She stated:

“Sometimes I would love to communicate with content creators but they basically don't reply. For example, I often watch Ma Zhuangshi's (Tiktok video blogger) videos,

I often watch his videos and he has quite a lot of followers. Once I wanted to make roast pork, I went to Tiktok and searched for his videos, or sometimes you occasionally flip to it, click on it and see if you think it's good, then go and watch it. Sometimes messaging him never got back to me.” (Zhang, personal communication, March 24, 2023)

Two participants indicated that they had tried to discuss their studies with other people on social media platforms, but that this type of interaction gave them a “bad feeling” (Lin, personal communication, March 7, 2023). Participants felt that in private chat rooms, as opposed to group interactions, both parties were unable to maintain a calm state of mind when “discussing complex learning issues” (Lin, personal communication, March 7, 2023), and that “discussions often turn into arguments” (Lin, personal communication, March 7, 2023).

Summary of Findings for Research Question 1

The results of research question 1 reveal the experiences of older Chinese rural learners in using social media as a learning tool. Based on the analysis of the primary data we found that the reasons for older adults to use social media for learning are very diverse and can be categorized into two main areas: social and personal reasons, all of which have been directly or indirectly influenced by the rural areas behind them.

There are a variety of different social media platforms that are used as learning tools in the learning process of older adults. Among them, Tiktok, WeChat and QQ are the most used social media platforms by older learners. Older adults also differed in their recognition of the learning functions of the three social media platforms, with the highest recognition being for Tiktok,

followed by WeChat, and finally QQ.

In addition, older adults show a variety of behaviors in the process of using social media for learning, including learning behaviors, using behaviors, and interactive behaviors. In the learning behavior we can find that the support of family members has a powerful facilitating effect on the learning of the elderly, and the same effect is also reflected in the interaction behavior, and the harmonious family relationship can effectively improve the interaction self-confidence of the elderly. In the use behavior section, we can find that older adults have different purposes for using social media, and one of the more unique ones is the interaction purpose, i.e., older adults choose to use social media to learn in order to get topics for social interaction. Taken together, the reasons and experiences section adequately answer the first research question.

Benefits and Challenges of Using Social Media for Learning

The second and third research questions examine the benefits and challenges of using social media as a learning tool. In this section I will combine my discussion of the findings by looking at the benefits and challenges as my response to the research questions.

Benefits of Using Social Media as a Learning Tool

The findings indicate that there are six main benefits for participants to use social media as a learning tool in their learning process. They are convenience, content richness, professionalism, effectiveness, meeting the interests of older people and safety. The convenience of social media is the main benefit, which fully meets the needs of rural older adults for informal and self-directed learning. Other benefits also influenced the learning behavior of older adults. The

main categories and relationships of the elements of this section are organized graphically in APPENDIX I.

Convenience. Convenience was identified by all participants as the most significant benefit of using social media for learning that distinguishes it from other learning methods. The fact that rural older adults can open their social media learning on their mobile phones anytime, anywhere, makes them feel very comfortable and convenient, which can enhance their learning. One participant stated:

“Learning with social media is quite convenient, let's say I want to know what's new, all kinds of information is quickly available in different groups, and then I don't have to organise things of interest by myself, someone can organise it and send it out. And if I had a problem that I couldn't solve by myself, I would have to ask someone. Now you, for example, like buy a bus ticket, buy a plane ticket, in WeChat I searched, I have a plan, I first searched for where I will go tomorrow, because the place to go may not remember how to go. As soon as I search with WeChat to which place it is about how long it will take to get there, by motorbike by car or by renting a car I can know.” (Tian Lu, personal communication, February 24, 2023)

One participant stated that before using social media to learn, she “learnt through the TV”, which made it “very inconvenient for me to need to switch on the TV in the living room at a fixed time every day to learn” (Zhang, personal communication, March 24, 2023). After starting to use social media to learn, she could “take out her mobile phone to learn at any time”, which greatly motivated her to learn.

Participants also valued the flexibility of social media, which was mainly reflected in the communication between participants and other learners. The sharing function of social media makes it very easy to send one's own learning content to other learners, who can synchronize the same content as the participant, and can also annotate and interact with the participant at any time through social media. One participant stated:

“I use social media to learn without the limitations of time and space, as long as I want to learn, take out the mobile phone can learn, and also can send their own interest in passing to other people, I want to learn history to see the historical content, want to see the modern also, I want to see the domestic or foreign are available, so it has very many learning resources..” (Lin, personal communication, March 7, 2023)

This flexibility facilitates communication between participants and other learners in a way that other learning modalities do not.

Content Richness. The richness of learning content is the outstanding advantage of using social media to learn, which collects learning content from many fields and puts them in different sections according to their characteristics. Rural elders “want to learn things as long as the search on the Tiktok can be found”, only “can not think of nothing that can not be searched for” (Tian Lu, personal communication, February 24, 2023). Older people liked the fact that they could gather learning content from different fields in one software, which saved them from spending too much time searching for learning materials. Participants said, “When using social media to learn, if I want to learn more than one field of study, I can switch freely through the navigation bar at the top of the social media, which allows me to explore more than one field of

study at the same time” (Lin, personal communication, March 7, 2023).

At the same time the richness of learning content provided by social media can also extend older people's learning domains, enabling them to learn about more areas. Some participants felt that they did not subjectively want to choose certain areas of content to learn, but the content-rich push of social media and their curiosity led participants to learn a lot about other areas of learning. The participant said, “I found that there is a lot of integration of messages on WeChat, so I don't have to look for them one by one by myself, and I saw some knowledge that I don't know but am interested in, and I can also discuss it with others together in the chat area, and I met a lot of like-minded friends” (Tian Lu, personal communication, February 24, 2023).

Professionalism. Professionalism refers to the specialized nature of the learning content provided by social media, which attracts many information disseminators with professional knowledge, such as professional chess players, professional players, calligraphers and chefs. These professional information disseminators have rich experience and professionalism in their own areas of expertise. By posting learning content on social media, they can disseminate a lot of professional knowledge to learners. A participant said:

“These social media have a lot of professional chefs, their skills are very professional. For example, my kids got me some fish for Chinese New Year, and there was a pomfret that I had never fried before, so I quickly went on Tiktok to check how to fry pomfret. Tiktok above a lot of hotel chefs teach us how to fry pomfret, are very professional, and very skillful.” (Xiu Cai, personal communication, March 4, 2023)

For rural seniors, this breaks down the barriers to their thinking and allows them to access more advanced and specialised information right in the countryside. This specialised learning information can effectively improve older people's knowledge base and learning.

For example, one participant said that before coming into contact with social media, he used to be guided by his “brother in chess” (Lin, personal communication, March 7, 2023). However, his brother's “chess level was also limited”, so the participant soon “reached a bottleneck in chess level and did not improve for a long time” (Lin, personal communication, March 7, 2023). After coming into contact with social media, he found that “there are many chess professionals broadcasting live through QQ” (Lin, personal communication, March 7, 2023), so he followed the professional chess players' live broadcasts every day to learn chess skills, and soon mastered many chess skills that ordinary people don't have, so that his “chess level has made a leap” (Lin, personal communication, March 7, 2023). This kind of technological leap is achieved through learning professional knowledge. This leap in skill through learning expertise is one of the benefits that rural older people receive.

Effectiveness. Effectiveness is categorized into the actionability and timeliness of the learning content provided by social media. Rural older adults generally benefit from the actionable nature of social media learning content, as they are less educated and less receptive to fresh knowledge than older adults in urban areas. This is coupled with a deterioration in their learning ability due to age, making them more in need of easy-to-understand learning content. Using social media to learn perfectly fits the needs of the elderly. Take the life skills provided by social media as an example, in a video that introduces how to buy a train ticket, the video producer divides the buying steps into a

dozen branch steps, each of which is simple and clear, and explains everything from taking the bus to buying the ticket. One participant shared his process for buying a ticket based on the social media instructions:

“The social media learning content all works very well, for example, like buying a ticket, on WeChat I searched, I had a plan, I first searched for where I was going to go tomorrow because the places I go to may not remember how to get there. With WeChat a search to which place is about how long it is, by train by car or rental car can know.”

(Tian Lu, personal communication, February 24, 2023)

This kind of learning content with actionable content is very common on social media, and older adults find it makes their learning very comfortable because the probability is that they can accomplish the learning objectives just by following the guidance of the video or text. This effectiveness of using social media for learning is very practical and boosts learners' self-confidence.

Another salient feature of social media learning content is its timeliness. One participant recognized the timeliness of social media content:

“The first thing is the validity, that is, I think social media follows the mainstream of the society, and that's the role that I recognise. Many other learning methods can't reach such a fast speed, using social media to learn can immediately get the latest news, today's learning media can be used in socialising with my friends, which solves my needs, this is an immediacy, it's news and learning content are relatively fresh” (Lin, personal communication, March 7, 2023).

There is a lot of learning information that is not always available and needs to be constantly

updated. Compared to other learning methods, social media, because there are countless communicators sharing their learning content every day, using social media learning allows access to up-to-date learning content, which is important for some learning areas that require strong timeliness. A participant who used social media to learn how to buy medication at the pharmacy during the new coronavirus pandemic stated:

“I was sick and needed medication, and you have to go by a list of medications as directed by the government it's very cumbersome, there's a lot of different kinds of medications that you don't have a way to get filled. I'll go to Tiktok to search for all kinds of things, there may be some places that have some Chinese medicine approach, you according to the conditions of the neighbourhood, appropriate to get some drugs, Tiktok also has a daily update of the inventory of various drugs to the neighbourhood of the pharmacy, online to go to online shopping for the complementary” (Lin, personal communication, March 7, 2023).

Meeting the Interests of Older People. Meeting the interests of older people means that the learning content pushed by social media has a strong correlation with the learning interests of older people, so that older people do not have to spend a lot of time searching for content they are interested in, and improve the efficiency of learning. Rural older people “want to learn the content, want to get the answer it can quickly push”, and older people “according to the guidance can be achieved almost” (Tian Lu, personal communication, February 24, 2023).

This is due to the nature of social media; when learners bookmark certain areas of learning, follow informants in specific areas, or use the search bar to search for keywords, the social media

will learn about those keywords and recommend more relevant content the next time the software is opened. A participant stated, “I usually watch some news and calligraphy stuff on Tiktok, and after watching it more it remembers my habits, and now every time I open it it pushes me this content, which is pretty good, I don't have to look for it myself” (Xiu Cai, personal communication, March 4, 2023).

Participants felt that originally, they had to spend a lot of time searching for the learning content they were interested in when studying with books and newspapers, which made them easily demotivated and inefficient in learning. Social media, a way of pushing information that is highly compatible with their own learning interests, allows them to access the latest learning content that interests them every time they open social media, which is very friendly to the participants' learning behaviour.

Security. The digital, networked and community-based nature of social media also determines that once a user's information is published, it can be recorded, searched for and copied, and accessed by others in the same social network. Users are often confronted with a “yes or no” option by the social media operator when accessing certain services in social media. If the user chooses to agree, he or she must give up personal information to the operator; if he or she chooses not to agree, he or she will not be able to access the service. Elderly people “have to agree to a lot of permissions if they want to use these social media, and they can't use them if they don't agree” (Lin, personal communication, March 7, 2023). Users, who seem to have the right to make their own choices, are in fact faced with an infrastructure of social media that makes it difficult for them to make real choices. This means that users have to give up their privacy, including location and photo

information, if necessary, in exchange for the convenience of social media.

Regarding possible Internet surveillance, for rural older adults, they are not concerned about whether they are under online surveillance by social media or third-party platforms. There are three reasons for this. First, older adults believed that social media companies would provide them with information protection. Some participants were aware of social media monitoring behavior, but they "didn't care if they were being surveilled" (Zhang, personal communication, March 24, 2023) based on the security of social media, and participants believed that social media would protect their browsing data and personal information from being leaked. Second, rural older adults do not have sufficient awareness of Internet surveillance. Participants commonly accepted information-pushing services from social media platforms, which were based on surveillance of browsing records. While participants enjoyed the services, they did not realize that this was achieved based on surveillance of themselves because of the lack of Internet knowledge. Third, they believed that their private data had no value and that they would not lose anything even if they were monitored. Some participants believed that they were "retired and not rich" (Tian Lu, personal communication, February 24, 2023) and that they would not lose anything if their personal information or social media browsing records were under surveillance.

According to the interviews, participants generally believe in the security of social media platforms, and they believe that social media platforms do not intentionally disclose their information, this is because in the process of using social media for learning, participants found that the platforms have perfect protection measures for personal privacy. For example, there are a variety of login methods, and the main ones commonly used by current users are account secret login

authentication, fingerprint recognition login authentication, and face recognition login authentication. A participant said, “I think these social media platforms are doing a good job of protecting privacy, for example, I can use face recognition to log in, which is convenient and safe. And they are all big companies, so there should be no problem in this aspect” (Zhang, personal communication, March 24, 2023). Moreover, the owners of the social media platforms are all large companies with very advanced defence technologies against cyber-attacks, and the software stability of the social platforms is also very high.

Having learnt about the defence techniques of the online platforms, older people were more confident about entering their private information into social media. One participant commented, “Sometimes what I'm interested in involves my personal or professional privacy, and I value confidentiality more, and these social media software themselves don't give anything away about you, at least not to me” (Tian Lu, personal communication, February 24, 2023).

Challenges of Using Social Media as a Learning Tool

The findings showed that participants faced five main challenges in using social media as a learning tool in the learning process. They are information leakage, advertising, social shame, operational difficulties and lack of teaching. These five challenges did not occur in isolation; sometimes participants faced 2-3 different challenges at the same time. The main categories and relationships of the elements of this section are organized graphically in APPENDIX J.

Information Leakage. In the above section we mentioned the security of social media, participants believed that social media platforms do not leak their information, but most of the participants believed that third-party software relying on social media platforms leaks their private

information, which is a major concern and challenge for older adults when using social media for learning.

Typical information leakage was related to social media platforms and shopping platforms recommended by information disseminators. One participant stated, “Before we didn't have many people on the phone, and after I bought something on top of the social media platforms, there were always these phone calls coming over to sell things for three days” (Zhang, personal communication, March 24, 2023). When older people use social media to learn, the platforms will pop up links to goods related to the learning content, and when clicked, they will jump to third-party shopping platforms, some of which are part of the social media platforms, and some of which are standalone software that just has a partnership with the social media.

When older adults shop using these platforms, their private information such as address, phone number, age, etc. will be obtained by the shopping platforms, which do not have a very comprehensive confidentiality system, and thus may result in information leakage. One participant expressed concern about information leakage:

“Things like getting my personal information and then calling me, and some adverts blocking the videos I want to watch. There were a lot of cases like this one, and then I used to go to a cell phone repair place and have someone readjust my phone and uninstall all the software I didn't want.” (Xiu Cai, personal communication, March 4, 2023)

The participant reported that he was often contacted by scam phone calls since he had purchased items from the online mall in the social media platform. And if he gave a bad review

of an item, someone would call him to ask him to delete the review, so he found that his private information had been compromised. She said, “Since I've been using Tiktok, I've gotten a lot of scam messages, always recommending me some kind of product, including scam text messages I've gotten twice.” (Zhang, personal communication, March 24, 2023).

Advertisement. Advertisements on social media caused a lot of problems for the participants' learning. There are two types of adverts here, the first is the adverts from the social media platforms themselves, this type of adverts make up a small portion of all adverts and the main purpose is to advertise certain content on the social media platforms and attract users. The second type is advertisements placed on social media by third-party individuals or businesses, this type of advertisement accounts for the majority of all advertisements, and the main purpose is to advertise third-party paid courses or merchandise, and there are many false advertisements appearing in this type of third-party advertisements.

All participants reported that they, as rural older adults, did not have the ability to differentiate between advertisements, which led them to take many of the advertisements as normal learning content. Participants felt that “there are a lot of scam adverts” and that during the learning process “there are a lot of adverts, some adverts are visible and some are not visible as adverts at all” (Zhang, personal communication, March 24, 2023), which made the learning process challenging for participants. Although all adverts on social media are tagged with the advert below, the advert will not be visible. are tagged with the advert at the bottom, the font is generally very small and difficult to recognise with older people's eyesight. One participant stated, “the main thing is that this kind of software has a lot of adverts, and we older people

don't have much discernment, so we can easily be tricked, I think we can come up with a version without adverts for older people or minors” (Xiu Cai, personal communication, March 4, 2023).

A more serious challenge for older adults is the false advertisements that pop up during the learning process, and older adults can easily believe these false promotions and purchase substandard quality goods. One participant reported, “I saw an advert for calligraphy paper that popped up while I was using social media to learn calligraphy and believed the quality of the item described in the advert, but after receiving the calligraphy paper I found it to be completely unusable” (Lin, personal communication, March 7, 2023). There were also participants who purchased tea on social media: “There was a discrepancy between buying tea on social media and what it was advertised to me. He said 7 big tins but there wasn't that much tea in it, I received it only to find out that there was only 15 grams of tea in one tin” (Lin, personal communication, March 7, 2023). Not only do these false adverts cost older people money, they also undermine their confidence in using social media to learn.

Faced with the proliferation of false advertisements, participants use a variety of methods to respond. For example, when participants saw an article on social media, they would check whether the title was strongly provocative and tendentious, whether the author was an authoritative expert or professional in a certain field, and whether there was a link to purchase goods attached to the article. Only after passing these checks will they continue to read the article. But checked articles are not absolutely free of false content or advertisements, and rural seniors do not have the ability to check for in-depth false content.

Social Shame. Social shame is a challenge that some introverted rural older adults face

when using social media to learn. Not every rural older person is extroverted enough or has enough information to communicate with other learners on social media. There are many rural older people who have spent their entire lives in the countryside, who have spent their entire lives in a few neighbouring villages, who have travelled as far as the market place in the town centre, and who have a social circle of only a few dozen people.

These rural older people “may not ask questions sometimes, except to observe society and learn about their work”, and they feel “a little embarrassed that older people often ask questions” (Xiu Cai, personal communication, March 4, 2023). This kind of older people are generally more introverted and more conservative, they can accept to use social media to learn, but do not like to communicate with people on social media or want to communicate with people but do not dare to take the first step, which creates social shame. A participant said, “one is that the mindset has changed, people want to save face more when they get older, sometimes they are embarrassed to ask people questions, I don't want to draw attention to myself, and I don't want to come out too much as a result of psychological effects” (Xiu Cai, personal communication, March 4, 2023).

Lack of Instruction. Social media platforms do not provide detailed instructions and instruction on how to use them, which makes it challenging for rural older adults to learn to use social media. Older people are taught the basics of the software when they first start using social media, but learning the basics is not enough to become proficient at using social media. Moreover, this instruction only occurs once, and if older adults forget how to use the software due to memory loss, they are unable to turn on the instruction a second time. One participant stated, “I found it difficult to

learn Tiktok at the beginning because it only had a newbie tutorial once, and the second time I logged in there was no newbie tutorial, but it was a pain when I couldn't remember how to operate it after learning it only once” (Zhang, personal communication, March 24, 2023). This makes it very difficult for older people to learn using social media, and they can only go to family members for help when they forget how to operate it.

Different social software provides different instruction on how to operate, for example, WeChat and QQ provide instruction on how to operate mainly on how to use the communication function of the software, there is no instruction on how to use other software functions. A participant said:

“For example, when I started using QQ, it was not easy to use. QQ basically did not teach me how to use the software once I opened it, once I opened it, it was the interface of the software, and there was no guidance whatsoever, and it was only because I slowly fumbled around on my own that I learnt how to use it.” (Tian Lu, personal communication, February 24, 2023)

This makes the elderly in the understanding of the basic operation of the need to find their own learning boards and news boards, adding a lot of time costs.

Difficulty in Operation. Difficulty in operation is only a result of many social media software not paying attention to their learning function and not optimising the learning section separately, which leads to inconvenient operation for the elderly. Some participants described the difficulties they encountered:

“I sometimes want to transfer the learning content from QQ to WeChat, I can't use

the mobile phone software directly, I still need to use the computer, I can only convert it through the computer's save as, and I have to choose whether to convert multiple batches or a single batch, sometimes I happen to get the whole thing right, and sometimes it doesn't work how to operate it, which is very troublesom.” (Tian Lu, personal communication, February 24, 2023)

According to participant reports, among the three main social media learning tools, Tiktok has done a good job of optimizing the learning function: “Tiktok is still quite good, it's better to use, the main thing is that it only has one interface, like QQ I won't use it now, it has too many interfaces, it's too complicated” (Zhang, personal communication, March 24, 2023). Older people using Tiktok can easily find the learning content they need, and can also quickly bookmark and comment on the learning content.

QQ and WeChat just have a learning section and learning content, but they have not optimized the learning section, for example, you have to go through 3 to 4 steps before you can find the learning content, and you are prone to lagging during the operation, and the operation of bookmarking and commenting on different sections of the learning section is not the same. Participants said: “Compared to Tiktok, QQ and WeChat are not as comfortable to use, and they make some functions too complicated. For example, if I learn to play chess on QQ, I have to open several interfaces after opening QQ, unlike Tiktok, which opens with the learning content” (Lin, personal communication, March 7, 2023). These lacks of software optimization create challenges for older people when using social media for learning.

Summary of the Benefits and Challenges

The results of Research Question 2 showed that older adults in rural China perceived six main benefits of using social media as a learning tool. The most common benefit was convenience, with all participants indicating that the convenience of social media was the main feature that distinguished it from other learning methods. Learners can use social media to learn at any time and any place, which can save a lot of learning time, and learners can conveniently share learning information through social media. Other significant benefits include the richness and professionalism of the learning content. Social media brings together learning content from a variety of fields, and many of the providers of this content are professional workers, and this rich and professional knowledge can significantly improve the knowledge level of learners and break down the solidified knowledge barriers of the elderly.

The fourth benefit of social media that participants agreed on was effectiveness. The learning content provided by social media is very effective and usable, older learners can easily apply the learning content to their lives, and the content is very current, allowing older people to learn the latest knowledge. The fit of social media pushed content to the interests of older adults was also unanimously recognized by the participants, who strongly endorsed this personalized push mode based on personal interests, which allows learners to access a wide range of learning content of interest to them and makes them more active in learning. Finally, the participants were not worried about their private information being leaked by the social media platform because they believed that the platform, as a large enterprise, had perfect technical reserves to prevent any information leakage.

The results revealed that rural older learners face five main challenges in using social media

as a learning tool. The first challenge is information leakage, as social media platforms are connected to some shopping platforms so that learners can buy learning content related goods, and these shopping platforms generally do not have a strict confidentiality system, resulting in learners finding their information leaked by the shopping platforms after they have made purchases, which will make the learners lose trust in social media platforms, and they are even reluctant to use social media for learning.

The second is advertisements, there are a large number of advertisements from third-party companies on social media platforms, and some of these advertisements are exaggerated or even false, and older people do not have the ability to distinguish the content of advertisements, which leads them to believe the content of advertisements, and even to learn the advertisements as learning content. The third challenge is social shame, in the experience section we can find that interactive behavior is an important part of older people's learning using social media, but not every rural older people have the courage to interact with other learners, there are some participants who think that they are elders and are too embarrassed to interact with other people on social media, and this kind of social shame causes older people to lose the experience of interactive behavior. The final challenge is the difficulty of operation and the lack of instruction, some social media interfaces are very bloated in design and do not provide perfect guidance, which makes it difficult for older adults to become proficient in the operation of social media and creates a great challenge to their learning process.

Chapter 6: Discussion and Conclusion

In this Chapter I will explore and discuss the findings of this study more broadly. In addition, the chapter includes implications for practice and scholarship, as well as limitations of the study. Finally, recommendations and suggestions for further practice and research are provided.

As a basic human right of , people's desire to learn has never been differentiated by region, age, race and culture. At present, the rapid development of social media technology is sweeping through both rural and urban areas like a torrent, and everyone in society is either actively or passively joining the wave of informatization, so that everyone can become a user of the new technology and a participant in the flood of social media development.

As more and more older people in China's vast rural areas are beginning to use social media for learning, research centered on the experiences of older Chinese rural learners who use social media as a learning tool is crucial. As the infrastructure of rural China is getting better and older people are becoming more affluent, more and more rural older people are emphasizing their inner and spiritual needs in addition to the basic necessities of life such as food, clothing, housing and transportation. Learning through social media not only helps the elderly to develop hobbies, but also promotes their physical and mental health. Through social media learning, older people's lives become more meaningful and they have a new understanding of learning.

On the academic side, there are many scholars who have studied the use of social media in the field of learning, but there are limited studies on learners in rural areas using social media for learning. This study effectively fills the lack of research in this area by exploring how to study

social media learning and rural older adults as a whole through a specific group of learners, rural older adults, and by acquiring the experiences of rural older adults in China who use social media for learning. In order to fully analyze the acquired learning experiences of older adults, this study explored the use of social media by older rural Chinese learners and the benefits and challenges when social media is used as a learning tool.

Discussion

The objective situation of rural older people and their need to learn are the main reasons that drive their use of social media for learning. There are many objective reasons why older people choose to use social media for learning, including free time, past experiences, health status and economic status. Rural older people generally no longer need to work, children need to work during the day and cannot accompany the elderly, so older people choose to use social media to fill have a lot of free time. Past experiences of actively trying out new ways of learning have made older people receptive to the novelty of social media.

Healthy lifestyle habits of the elderly and good medical facilities in the rural areas help the elderly to maintain good health. The rent received from leasing out the land gave the older people the money to install Wi-Fi and buy smartphones, which prepared them well for using social media for learning. The results of this study are in line with the influencing factors of self-directed learning, some scholars have explored the factors affecting the self-directed learning of the elderly, and they believe that the influencing factors are complex, mainly including the individual factors of the elderly (gender, education, age, health status, etc.), family factors, cultural factors, socio-economic factors and so on (Glass Jr, 1996).

The importance of subjective feelings should also not be ignored, Robertson and Merriam (2005) found that interest was the starting point of self-directed learning for rural older people aged 75-87 by studying their self-directed learning process. On the subjective side, older adults who use social media to learn generally have a strong sense of curiosity and social responsibility; curiosity drives them to keep trying new things, and social responsibility makes older adults eager to get information about the outside world and learn about changes in society. Moreover, older people are willing to share their learning styles with their friends, which provides a basis for the spread of social media learning among older people.

The current situation in rural areas can have an impact on personal reasons, which can indirectly contribute to the use of social media as a learning tool among rural older adults. The indirect rural influence is reflected in various aspects of the study results. Firstly, the desire of older people to meet new people due to the relatively closed social environment in rural areas has led to older people choosing to socialize through learning on social media and the desire to break out of the rural confines. The findings are similar to those of McDonald (2016), who lived in rural China for 15 months to study how residents used social media in their daily lives, and whose ethnographic findings suggest that rather than being left behind, social media has become deeply integrated into the daily lives of many rural Chinese.

Second, rural areas offer insufficient offline learning opportunities and educational resources. Community education in rural areas is not sufficiently developed to provide adequate learning opportunities for older people, which has led to older people generally opting for more accessible and free social media learning. This is a common phenomenon in rural areas of the

world, where the availability of learning opportunities and community education is significantly lower than in urban areas (DeYoung, 1987). This has led rural older people to actively seek out new ways of learning and learning tools. Thirdly, as the main recreational activity in rural areas is chatting, older people choose to use social media to learn in order to get more topics to chat about, and sharing what they have learnt with their friends will give them a sense of achievement, which can promote the motivation of rural older people to use social media as a learning tool.

Experiences

The use of social media as a learning tool satisfies the desire for self-development of rural older persons. The use of social media as a learning tool by rural older adults provides access to information in multiple domains, fulfils the need for self-development, and the use of social media exercises the learning ability and responsiveness of older adults and maintains their mental health.

This study found that rural Chinese older adults use social media as their primary mode of learning. This is very different from the findings of Zhang (2015), who in his study on learning styles of older adults concluded that face-to-face learning, experiential learning, television learning, and online learning were in decreasing order of preference. These two completely different findings are related to the characteristics and learning needs of rural older adults. Zhang's (2015) survey is based on urban older adults, who are significantly higher than rural older adults in terms of basic income and ease of transportation. According to the results of this study, when rural older adults consider learning options, the first consideration is price, followed

by convenience, and finally the richness of learning content. Compared with urban seniors, rural seniors have lower incomes, so they prefer free learning methods. Most face-to-face teaching requires a fee, and due to the lack of educational resources, face-to-face teaching in rural areas cannot meet the learning needs of the elderly. If the elderly want to get high-quality face-to-face teaching in the city, they need to pay higher tuition fees and time costs, which is difficult for the rural elderly to accept.

Secondly, in terms of convenience, the convenience of using social media is significantly higher than that of face-to-face teaching and TV learning. Social media is characterized by the ability to access information anytime and anywhere, which is not available in other learning modes. Rural elderly people are more inclined to choose a learning mode that can decide the learning time and duration by themselves.

Finally, in terms of the richness of learning content, social media learning can provide learning resources in various fields, which are not available in face-to-face learning and TV learning. Moreover, the purpose of learning for some rural elderly is to alleviate their sense of loneliness, and the rich content provided by social media allows them to learn all the time and always have fresh information to access.

Based on the above three points, we can find that there is a great difference in the learning needs of rural and urban older adults, which also leads to a great difference in the findings of the two studies.

The results indicated that rural older adults' behaviour of using social media as a learning tool is a process in which individuals diagnose their learning needs, identify learning goals,

search for learning resources, select and implement appropriate learning strategies, and evaluate learning outcomes (Knowles, 2002). This is a concentration of self-directed learning among rural older adults, and self-directed learning implies that learners can select the various resources needed to carry out their learning based on their own decisions (Brookfield, 1993). Learning using social media also enables older people's personal preferences to be satisfied, and social media will push learning content that matches older people's preferences, such as life skills, health knowledge, digital learning knowledge, etc., which can promote in-depth learning in the areas of interest to older people.

Family members provide strong support for rural older adults to use social media as a learning tool. The results of this study show that family members' support for older people's use of social media as a learning tool is mainly reflected in the emotional, digital technology and financial aspects, first of all, in the emotional aspect, family members of older people generally believe that the use of social media for learning is a kind of behaviour adapting to the trend of the society, which helps older people's own development. Therefore, family members will actively support older adults to use social media and spend more time with them to learn. The results are similar to existing studies, and Zhou's (2022) study found that children, as the objects that older people trust and rely on the most, take on the responsibility of providing positive feedback on older people's learning behaviours. They attached great importance to older people's use of social media for learning in their daily lives and actively interacted with older people on social media.

The second point is that family members provide support for older people with digital

technology. Due to the lack of community education, older adults have to rely on family and friends to understand how to use social media to learn, and family members take on the role of educators. Some researchers have argued that younger family members aged 18-25 years old have a more positive supportive attitude towards older people's use of social media for learning because the younger group is more accustomed to the development of social media and more aware of the convenience of using social media for learning, and therefore are more accepting of older people's use of social media as a learning tool (Liu, 2022).

The present study corroborates the idea and provides the addition that family members with higher education are more positively supportive than those with lower education. Participants indicated that family members with higher educational qualifications were more accepting of the importance of older people's use of social media as a learning tool, that they could provide older people with joint time support, emotional support, safe internet support and digital technology support in terms of action, and that family members with higher educational qualifications had a better understanding of learning as a behaviour.

The third point is that family members provide financial support for older adults. Participants indicated that it was not necessary to obtain actual financial support from family members in using social media, as older people have their own savings and the cost of using social media as a learning tool is cheap. However, from the willingness of family members to provide financial support, older adults can understand the level of support they receive from family members and will feel more confident to continue learning. This is an aspect that many studies have not found, for example, Chen (2017)'s study found that family members would

support older adults financially, but did not delve into the impact of family members' attitudes on older adults. This study analyses the support of family members from several aspects and is more informative.

The interaction of rural older adults facilitates the rapid spread of the behaviour of using social media as a learning tool. The results of the study show that after using social media as a learning tool, rural older adults access more learning content than traditional learning methods. This learning content translates into topics of conversation when socializing, and other older people will also tend to use social media to learn after they find that using social media as a learning tool helps them to socialize, thus facilitating the spread of social media among the rural older people group. In such a mode of dissemination, social media achieves its own sharing and rapid dissemination with the help of continuous communication and interaction among older adults (Lim & Ahn, 2021).

Rural older adults unconsciously use social media for informal learning in the process of entertainment. Many rural older adults do not consider social media as a learning tool and simply use social media for entertainment and communication functions. Some participants indicated that they used social media for entertainment purposes only at some times, and at such times they did not have a clear learning goal and did not realize that they were learning. However, in the process of using it, participants unconsciously acquired a lot of learning information.

This kind of unconscious learning is in line with the theory of informal learning, that is, informal learning is a kind of learning activity that people do unconsciously in interpersonal and

living environments, which occurs outside of schools and colleges, and stems from the learner's participation in activities that are not intended for learning (Council of Europe, 2023). In terms of purpose, older people do it for fun, but in terms of outcome, they gain knowledge. This knowledge is common to several fields, and the purpose of learning is to enable the development of science or art. But people unconsciously learn a lot of detailed, contextualized knowledge on a daily basis, and this type of knowledge is more applicable in specific situations (Wellington, 1990). The result can also prove that informal learning is unconscious at some point and is an inevitable part of everyday life.

The use of social media as a learning tool provides a platform for rural older people to share learning content. When rural older adults use social media as a learning tool, the convenience and accuracy of social media in sharing learning content effectively improves the efficiency of their interactions, which reflects the irreplaceability of social media as a learning tool. Social media is an Internet-based application that is based on the ideology and technology of Web 2.0 and allows users to create, comment on, and exchange self-generated content, and these new technologies can effectively support users in creating, communicating, and sharing information in a friendly and harmonious online environment (Kaplan & Haenlein, 2010).

This study found that social media can be effective in facilitating interactions between learners in a learning environment for rural older adults. Participants reported that they experienced multiple forms of interaction during the learning process, including one-on-one, intergenerational, and group interactions, all of which included the delivery of learning content. This is consistent with Kind and Evans' (2015) study that social media provides learners with

multiple avenues of opportunities to share learning content, as well as more opportunities to learn.

Benefits

The use of social media as a learning tool allows the learning behaviour of rural older adults to be free from the constraints of time and place. The results of this study show that social media is an ideal learning tool for rural older learners. Participants can use several different social media to access learning information and achieve critical thinking about learning content as they communicate with other learners. There is some research on informal learning that suggests that informal learning is a unique way of learning for individuals where the initiative to learn is in their own hands, and it attracts all spatial and temporal learning behaviours that occur around people (Marsick & Watkins, 1997).

Participants in this study indicated that social media can break through the constraints of traditional learning styles by allowing learning to take place anytime, anywhere and for a length of time that can be controlled by the older adults themselves. This reflects the fact that using social media as a learning tool, the initiative of learning lies with the older learner himself, who can decide that the learning behaviour occurs at any time and any place. We can find that rural older adults use social media to learn as part of informal learning.

In addition, rural older adults strongly recognize the flexibility of using social media as a learning tool. Lindeman (1926) argued that the independence of adults in time and space in the learning process is the key to success. The results of this study indicate that rural older learners generally find social media convenient as a learning tool, with most participants talking about the benefits related to time and place. The results of this study are also in line with the need for

mobile learning, which is different from digital learning in that the learner does not have to be confined to a computer desk, the learning environment can be mobile, and teachers, students, researchers, and technicians can all be mobile (Winters, 2007). When learning on social media it saves time as there is no need to physically change location, and adult learners can easily and quickly access and share large amounts of information, can learn the same content in sync with other learners, and can quickly forward their learning.

Using social media as a learning tool can provide rural older adults with learning content that matches their personal interests. The results of this study show that social media can analyze the learning content that rural older people have previously viewed and collected, extract the areas of learning that older people are interested in, and push learning content of interest to older people, which makes it less difficult for older people to search for learning content. It has been shown that the general acceptance of information communication technologies by older people tends to reveal anxiety about computers and a general negative perception of information communication technology use (Leist, 2013). Participants in this study felt that social media tweets were effective in reducing the time spent searching for learning content, lowering their own anxiety and increasing their confidence in learning.

The use of social media as a learning tool allows rural older adults to access learning information with validity and expertise. The results of this study showed that most of the learning content that rural older adults accessed on social media was information of a professional nature, which came from information providers with specialised knowledge, such as chefs, lawyers, and professional chess players. At the same time, because the learning content

provided by social media is updated so frequently, learners have access to up-to-date learning content, which improves the ability of rural older adults to apply the learning content to their lives. Some studies have found that as social media becomes more prevalent, concerns about the validity of information increase, such as encountering too much information and finding irrelevant, conflicting, outdated, and untrustworthy information (Sin, 2016).

However, in this study it was not found that social media would provide too much ineffective information, and participants reported that when they searched for learning content, the most authoritative and up-to-date content would be placed in the most prominent position on social media for learners to access. This way of presenting learning content can prevent older adults from accessing too much invalid information.

Challenges

The use of social media as a learning tool may lead to information leakage among rural older adults because social media accesses personal information. The results of this study show that older learners have sufficient trust in the social media they use for learning and are willing to enter their private information into social media, but third-party platforms relying on social media can access older people's personal information by means of web links and other means, resulting in information leakage.

There are many scholars who have investigated the personal information leakage arising from the use of social media, among which Di Martino et al. (2019) implemented a survey on 55 organizations, which showed that 15 of them would gain full access to user data, which can be leaked through social media, and the leaked personal data contains a variety of sensitive

information, including financial transactions, website access and physical location history. Zhang et al. (2014) also mentioned that social media can leak users' personal information in the form of text. The results of these studies are generally similar to those of this study, with the more notable difference being that this study found that social media gain access to rural older learners but do not intentionally leak personal information, and that the leakage of information occurs on shopping platforms that rely on social media.

The use of social media as a learning tool may lead to deception among rural elderly due to the presence of a large number of third-party false adverts on social media. This study shows that there are a large number of false advertisements from third-party companies on social media, which are not easily recognizable without distinctive signs. Elderly people are prone to believe the content of these adverts, buy the goods recommended in the adverts, and learn the adverts as formal learning content. Participants said that the adverts in social media were too similar to normal learning content, resulting in them often clicking into the adverts by mistake.

Nuseir's (2018) study shows that false or misleading adverts are increasing in the current advertising market. Misleading adverts tend to provide significantly more positive information than necessary, but this positivity often results in a negative experience for the customer. This is in line with the experience of the participants in this study, where a participant who was using social media to learn calligraphy saw an advertisement for calligraphy paper that popped up, and believed the quality of the item described in the advertisement, but upon receiving the calligraphy paper found it to be completely unusable. Qureshi and Gopal's (2023) survey of 103 young people in Malasia showed that advertisements on online platforms manipulate consumer

purchasing behaviour. This manipulation was even more pronounced in the case of older people who had no discernment, and the ubiquity of false advertisements created many negative memories for the participants, even causing some of them to reduce the frequency of their studies.

Social shame among rural older people may lead to a lack of interactive sessions when using social media as a learning tool. Not all rural older people are happy to share their progress and learning with others, and some introverted older people stay in rural areas for long periods of time and lack opportunities to communicate with others. Some of the participants said they develop social shame and feel that communicating with others is an uncomfortable behaviour. So they tend to learn content on social media alone, missing interaction with other learners.

The results are in line with Walker (2017) who conducted a literature review which was used to explore the role of social shame in adult learning and educational theories. The review showed that adult learners have a variety of different responses to shame, which may hinder learning. But differently, Walker (2017) argued that shame rarely originates in the classroom or moments of learning in adult or higher education, and mostly originates in childhood experiences. However, this study shows that the development of social shame among some rural older learners is a gradual process that increases with age. The reason for this is that the authority of older adults in rural China grows with age, and some older adults are afraid of exposing their lack of knowledge in using social media with other learners, which would cost them their authority.

The use of social media as a learning tool may reduce the learning efficiency of rural older

adults due to the difficulty of operating social media and the lack of guidance. All participants reported that the operational difficulty and information accessibility varied across social media, with Tiktok having a simple operational logic that made it easy to find and bookmark the desired learning content, and WeChat and QQ being relatively difficult to operate and requiring 4-5 steps to be carried out to find the learning content.

This result is different from other researchers, such as Kaplan and Haenlein (2010) who found that social media has significant ease of operation. However, these studies do not take into account the differences in the study population; older people are less receptive to new things and have poorer memories compared to younger people, so some of the social media operating steps are very convenient for young and middle-aged people but unacceptable for older people.

Implications for Practice and Scholarship

This study of rural Chinese older adults' experiences with social media as a learning tool has important implications for practice and scholarship in several ways. The findings of this study may enable rural older learners, community educators, and family members of older adults to create learning environments and learning climates that are more appropriate for rural older adults in the rapidly evolving environment of social media. Social media software developers may also find ways to improve social media from the results of this study to make social media more appropriate for older adult learning, thereby increasing older adults' learning effectiveness and motivation.

Generalization

The findings of this study can be generalized to a group of Mandarin-speaking rural older

adults in China. First, the participants in this study were four rural older adults in Mulan Township, Wuhan City, China, who are part of all rural older adults in China and whose experiences are to some extent representative of those of rural older adults in China. Second, the participants in this study included rural older adults between the ages of 61 and 75, which is a diverse age distribution that can represent the experiences of rural older adults of different ages. Finally, the participants in this study all used Mandarin, and their experiences are generalizable to rural older adults in Mandarin-speaking environments. For these reasons, the findings of this study can be generalized to the Mandarin-speaking rural older adult population in China. The findings may be generalizable to other age study populations or language environments, which requires more in-depth research for validation.

Implications for Rural Older Learners

The results of this study show that rural older adults have strong recognition and trust in all social media during the learning process, which makes them open a lot of cell phone permissions to social media and shopping platforms, and do not pay enough attention to their own privacy protection, and the results of this study can lead to an increased awareness of privacy protection among rural older learners.

Rural learners have to adapt to new roles and environments when they enter the old age stage, they don't need to work in agriculture after their land is leased out, and the physical state and social interaction of the elderly have changed significantly, so they can't rely on their original life experiences alone to adapt to the new status quo, and they have to continue to learn in order to adapt to the ever-changing social environments. Although older adults have more life

experience than younger adults, they lack a certain level of information literacy when it comes to using social media for learning.

The results of this study show that social media is not perfect, and older adults also unconsciously disclose a lot of private information in the process of learning. This requires older adults to improve their information literacy and have a deeper understanding of social media. Older people must understand what social media is, how to use it, what are the precautions to be taken, and when using it, they should pay attention to follow a certain learning pattern, from shallow to deep, step by step, slowly, and must take the initiative to ask for advice from people around them when they don't know what they don't understand. For the elderly, it is necessary to take notes, so that the elderly will not easily forget what they have learned, after all, their memory will be weakened with age.

At the same time older learners need to change their perceptions, rural older adults need to have a proper understanding of privacy breaches in social media use and need to know how to prevent their private data from being accessed. According to the survey results, it is very difficult for rural older adults to raise their privacy awareness on their own, and it is necessary to create a social atmosphere for older adults to guide them to gradually change their perceptions.

Implications for Community Educators

Community education has many advantages that her form of education does not have, and it is also the closest educational institution to the rural elderly, theoretically speaking, community education can be very good for the rural elderly to provide social media enlightenment. However, this study found that the current community education has many shortcomings, the

curriculum does not meet the needs of the elderly and the form is single. In terms of curriculum, community education organizations should consider the needs of the elderly, such as gender, age and education level, and diversify the curriculum. For example, in terms of learning purposes, many older people want to learn how to use social media. There are also many older people who wish to be physically healthy and need to learn exercise courses. Older people are concerned about their own development and physical health, community education institutions can focus on social media and exercise courses, the curriculum is scientifically divided and adjusted.

In terms of teaching format, different older people have different education, social experience, physical condition, which requires teachers to teach older people in a flexible and varied mode, in order to teach the most suitable knowledge for older people in the most acceptable way. According to the interviews, the rural elderly do not like a single boring mode of teaching, and if they are taught in the lecture mode or meeting mode of a normal school class, the elderly learners will find it boring and tedious, which will reduce their desire to learn. Elderly learners prefer a teaching mode with free discussion and a lot of interactive sessions. Since some older people come to community education organizations for social purposes, adding interactive and free discussion sessions can deepen the learning effect of older people. At the same time, you can also add some activities in the course, the memory of the elderly is generally not as good as young students, so it is difficult to remember all the knowledge taught by the teacher, if you add some activities, you can effectively deepen the knowledge of the elderly students to master.

Rural elderly people have different degrees of needs for various social media, but

because of the influence of cultural level or physical condition, they can not independently satisfy their own needs, while their children need to work and do not have enough time to guide the elderly for a long time. In response to this situation, community education institutions should take active action to establish social media learning groups for the elderly, and each group can arrange a young teacher to regularly solve the problems encountered by the elderly in the use of social media. Within the group, the elderly can be grouped according to their proficiency in the use of social media, which will enable the elderly with high proficiency to influence those with low proficiency, and at the same time learn from each other to enhance the older people's ability to learn and enrich their daily lives.

Implications for Social Media Developers

Currently, social media is in a stage of rapid development, constantly providing users with a variety of new functions, but according to the results of this study, there is still a need to improve the adaptability to the elderly and cybersecurity.

The current social media users are mainly young people, and the operating methods and guidelines of various social media are based on the learning ability and memory of young people, and this design is not friendly to the elderly. In the development of social media, it is necessary to consider the characteristics of the elderly in terms of their physical condition, psychological state, cognitive level and other factors, and provide social media design and application services that meet their needs, so that elderly learners can use different social media as conveniently as other users.

Social media developers need to fully understand the psychological demands of the elderly,

and the psychological demands of the elderly for each product, service, or device are different for each age stage, physical condition, and even each region, so there is no universal solution that can satisfy the needs of all elderly learners, and it is necessary to continue to improve and optimize the development of social media software in accordance with the use of the elderly learners' scenarios and environment. Social media software.

From the current situation of social media, many social media provide a single learning pathway. In order to promote the diversified development of gerontological education, social media developers must broaden the learning pathways for older learners. Due to the influence of age, education level, interests and other factors, the educational needs of the elderly will be different. Therefore, software developers should take into account the learning qualities of the elderly when they use social media to learn, and add learning contents suitable for the elderly, such as physical and mental health knowledge, digital knowledge for the elderly, etc. Moreover, in addition to the text form, the learning contents can be carried out in the form of pictures, live broadcasts, videos, etc., or in the form of illustrations and text, in order to broaden the mobile learning paths of the elderly. Only by doing so can we satisfy as much as possible the mobile learning needs of the elderly at different levels, and can we make social media platforms quickly become one of the important ways for the elderly to learn.

The information literacy of the elderly also deserves attention, and social media developers should introduce some digital technology knowledge that meets the reading habits of the elderly in response to the needs of the elderly, continuously strengthen technical support, launch relevant products suitable for the elderly to learn, and provide the elderly with adequate operational guidance.

The results of the study show that rural older people find social media difficult to operate. Various social media can add operation modes suitable for the elderly according to their actual needs, such as increasing the font size of articles and videos, using handwriting or voice for text input, reducing complicated operation steps, reducing false advertisements, and setting up specialized operation guides for the elderly.

Cybersecurity is also a noteworthy aspect of social media for developers. Social media platforms need to understand older adults' views on personal privacy and constantly update their security measures. Developers must continue to develop advanced defense technologies that can effectively enhance online information security. In order to reduce the risk of information leakage faced by older people, software developers can provide support in terms of both publicity and technology. In terms of publicity, it is necessary to strengthen the publicity on the protection of personal privacy information for the elderly and help them improve their security literacy. In terms of technology, social media platforms need to further develop information security technologies, especially key technologies related to privacy protection for older users.

Implications for Family Members of Older Adults

The reason why elderly people choose to use social media learning as a way to pass time is largely due to the fact that they are usually unaccompanied during the day and are alone and lonely by themselves. The results of this study show that almost all of the elderly people said that their children have to work most of the time during the day, so the elderly people at home can only find support on social media to pass the time, thus spending a lot of time, which may have an impact on the physical and visual conditions of the elderly people.

As a family member of an elderly person, it is important to pay attention not only to the material needs of the elderly, but also to their spiritual needs, and to understand their spiritual condition. Even when they are busy working outside, they should contact their parents more often and share their lives with them. When they are free on holidays, they should accompany the elderly, cultivate family affection and strengthen the family bond. Family members should also give genuine care to the elderly's online life, and family members need to clearly grasp the various things that the elderly encounter in the learning process, so that the elderly can rely on their children when they encounter false advertisements or information leakage, rather than being scammed by false advertisements.

In addition, the results of this study show that family members have a strong influence on the use of social media learning among the elderly in rural families, and almost all of the interviewees said that they started to learn how to use social media because of the influence of their family members. However, the influence of children on the elderly does not accompany the entire process of social media use by the elderly, because some children are not with the elderly for a long time, so the influence on the elderly often stays at the stage of learning to use social media, and the influence is not strong at the stage of interacting with or using the social media, that is, the influence is only exerted when the children are free to come back to their homes. Based on this, children should find more time to train older people in the use of social media, especially for those with a low level of literacy, and should invest more time and energy to ensure that they are proficient in social media or other cell phone software.

In addition, family members can help older people not only within the family, but also other descendants can provide support for older people to learn about social media, so that many older

people can enter the world of social media, experience the continuous development of society, and feel the beauty of life.

Implications for Scholarship

There is a lot of research on older learners and a lot of research on social media, but very little cross-sectional research discussing older adults' use of social media for learning. According to the findings, rural older adults have unique life circumstances and unique learning needs that can be effectively met by using social media learning. The unique convenience, richness of learning content, safety, professionalism, and interest fit of social media can enable older learners to overcome the challenges they face in their use and persist in using social media for learning. For scholarship, this study fills a gap in research on older adults and social media and explores the reasons, experiences, benefits, and challenges of using social media for learning through the lens of rural older adults. Future academic research could also build on this study by exploring in greater depth the behaviors of rural older adults who use social media media for learning.

Limitations of the Study

Research limitations are systematic biases that are beyond the researcher's control and may affect the results of the study (Price & Murnan, 2004). The study in this paper still has some limitations, firstly, this study selected Mulan Township, Huangpi District, Wuhan City, Hubei Province, China as the selection area for the participants, who were rural older learners with experience in using social media, and these people represent a subgroup of Chinese rural older adults. The target population of this study was all Chinese rural older adults who use social

media for learning. Therefore, the results of this qualitative study cannot be fully generalized to all rural Chinese older adults.

The participants were limited to one region and a limited number of participants, the sample was limited, and due to the different developmental situations and cultural environments of different participants' villages, different behaviors of using social media for learning may also arise, so whether the influencing factors derived from this paper's conclusions are applicable to different geographic regions and types of villages will have to be further examined in subsequent studies.

Second, during the research design phase, China was still in the period of the covid-19 pandemic, which has caused governments in various countries around the world to tighten control over entry and exit, and China is no exception (Cucinotta & Vanelli, 2020). Therefore, this study utilized Zoom conferencing software to interview participants online. Compared to offline interviews, this study did not use a webcam and the sense of communication would be weaker, which may lead to some missing information.

Third, due to the generally low literacy level and limited language ability of the elderly in rural areas, which led to the fact that most of the interviewees in this study were elderly people who were proficient in Mandarin, the examination of individual characteristics of the elderly group who are limited to vernacular communication is something that needs to be further strengthened in subsequent studies.

Finally, this study used the data analysis method of grounded theory, but due to the complexity of the original interview data may have missed some factors in the coding process, and the three levels of coding of grounded theory has subjective factors interference, so it may ignore some

connections or the categories are not well categorized. And there are also limitations such as the depth of the interviews and the limited number of interviewed older adults, which can make the research results more complete if the mechanism of the role of the factors influencing the behavior of short video use among older adults is further explored at a deeper level through quantitative research methods such as questionnaires in the future research.

Recommendations for Future Research

This study's provides a thorough analysis of rural older adults' behavior in using social media as a learning tool. I have three ideas regarding future research.

More Refined Research

This study has analyzed rural older adults' behavior of using social media for learning from four aspects: reasons, experiences, benefits and challenges, but from the analysis process of this study, there is still a lot of room for future research, and the direction of the research can be more refined. For example, a more detailed analysis of the reasons why rural older adults use social media to learn can be conducted, and the emergence of older adults' learning behaviors is the result of a combination of factors. This study only distinguishes between internal and external factors and analyzes several major causes, which still has a lot of room for research. In future research we can not only analyze what are the specific factors, but also find out the possible effects of these factors on the elderly.

Community Education

Future research could focus more on the impact of community education on rural older adults' learning to use social media. For example, during the interviews, many participants indicated that

they had wanted to seek help from community education organizations in learning to use social media, but encountered obstacles. Specific hindrances included self-imposed barriers, family barriers, social barriers, and school barriers.

Physical barriers are objective factors. Older people's bodies are weakening as they get older, and weakened vision and hearing are more or less present in every older person, and given the distance between the community school and their homes, going to school every week can be a physical challenge for older people. Family barriers are mainly situations such as unsupportive family members and older people who do not have time to participate in learning due to the need to care for later generations.

Social barriers refer to the perceptions of older people's surrounding groups about their participation in learning. Since there are still many people in the community who are prejudiced against universities for the elderly and believe that since older people don't work, there is no need for them to participate in learning, older learners need to overcome some of the different perspectives of those around them in order to be able to enter the classroom. School obstacles mainly refer to the fact that older people are reluctant to participate because of reasons related to community schools, which include whether the transportation is convenient, whether the hardware facilities are complete, and whether the fees are reasonable.

All of these barriers have an impact on rural older people's use of social media for learning. For older people, improved community education services are very important, so more in-depth research on community education is needed.

Influence of Family Members on Older Adults' Use of Social Media for Learning

Family members have a significant impact on older adults' use of social media for learning, and future research could focus on the niche of the impact of family members. This study found that family support has a significant impact on older adults' participation in learning. Older adults learn while assuming their corresponding roles in the family, so family support becomes an important factor influencing older adults' participation in learning digital skills. Family members' opinions on older adults' use of social media can be an important influence on their use of the Internet. In a family, children have an influence on the way older adults live in their later years, including the level of consumption and the right to make decisions about family affairs, which in turn has an impact on older adults' use of social media for learning. Support from family members can also have a positive impact on older adults' learning.

The results of the study found that the help and encouragement of family members have a good impact on older people's learning to use social media, and the companionship of family members to their parents will make them feel a sense of happiness and superiority, which will motivate older people to accept new things. Finally, the help and guidance given by family members to older adults in terms of digital skills has a fundamental role in older adults' learning to use social media. All these elements about the influence of family members on older adults have a lot of room for exploration and can be further researched.

Conclusion

This qualitative study was an in-depth exploration of the experiences of four rural Chinese older learners using social media as a learning tool. The purpose of the study was to explore the reasons, experiences, benefits and challenges of rural older learners using social media as a learning tool.

This study used a qualitative research methodology by collecting primary data using one-on-one interviews and analyzing the primary data using a grounded theory approach. The purpose of this study was to analyze the experiences of rural older learners in using social media for learning, to understand the benefits and challenges they face in using social media for learning in order to inform the developers of social media, so that the operation of social media can be made more compatible with older people's software operating habits, the learning content can be made more responsive to older people's needs and there can be a breakthrough in cybersecurity.

This study also aims to provide information to children of older learners so that they can understand how older people learn in their daily lives and how older people manage their loneliness, which can make children of older learners more supportive of older people's learning behaviors. Finally, this study can help community educators in China to understand the shortcomings of current community education in China and why older adults prefer to use social media to learn rather than participate in community education. This could enable community educators to improve their traditional education methods and combine social media with community education to provide a better learning environment and richer learning resources for rural older learners.

I spent my childhood in the countryside of China, which was poor but full of fun, with ponds, meadows and rice paddies, each of which was a paradise for me. But as I got older, I went to the city to study, and now I have not lived in the countryside for more than ten years, and I feel a deep sense of separation from the countryside where I grew up. Therefore, this research is more like a process of searching for my hometown and returning to myself. During the interviews, I heard experienced elders talk about their life experiences and wisdom, which made me feel that the link with the

countryside was gradually clearing up again.

When I first identified my research topic, my understanding of the behaviour of rural older people using social media as a learning tool was vague and isolated, and at the time I thought it was an isolated behaviour that older people could do with their own subjective awareness. And at that time, I thought that learning with social media was an icing on the cake of learning behaviours for rural older people as I could see from the news that community education and adult training courses were also available in rural areas.

However, after completing this study I found that rural older people's behaviour of using social media to learn is not isolated and it is influenced by a number of factors. One of the things that struck me was the participants' descriptions of their family's support for their learning. Regardless of whether family members were poor or rich, highly educated or less educated, accompanied the elderly on a daily basis or went home occasionally, they were very supportive of the elderly's use of social media for learning. This unconditional support gave me a sense of cohesion that is unique to rural families; it seems that this is how our parents helped us when we were children, and we help our aging parents in the same way as we grow up. And I found that in most cases, social media is not a supplement to community education, but the only option for rural older adults. Community education in rural China is still a long way from being a complete service for older people. Until then, social media is an inexpensive way to learn and can be used as a primary learning method to help older adults complete their self-development.

This research was also a process for me to integrate all of my undergraduate and graduate knowledge. During my undergraduate studies I took numerous courses on history, journalism, and

media. During my graduate studies, I gained a lot of knowledge about adult learning, self-directed learning, and informal learning. Through this research, I was given the opportunity to integrate and apply this knowledge. It gave me a deeper understanding of the theories that my professors told me about. The biggest impact this research had on me academically was that it showed me that the theories and studies of previous generations are not always right and that there is a need to be questioning. In my research, I have found that many theories do not apply perfectly to my field of study, and the conclusions of other researchers are often much different from my findings. This spirit of questioning makes me enjoy the process of research even more, just like an artist carving a sculpture, which requires reflection and breakthroughs based on what has come before.

At the same time, I was greatly encouraged by the participants' positive, hardworking, optimistic and responsible attitudes. I found many strengths in my participants that are unique to rural elders, such as wisdom, resilience, and willingness to help. My participants were willing to complete the one-hour interviews with me without being paid at all. This spirit that has been shaped by the years and the rural environment was present in each participant, and while life may not have brought them all happiness, they continued to break through with a spirit of optimism.

This study is just the beginning, and as more and more researchers and practitioners focus on this area, more and more people will understand how rural older adults use social media to learn, and the challenges older adults face will improve. I will continue on this path as well, and I hope that I can use what I have learnt to help rural older people with practical issues. I believe that the wisdom and resilience that I have learnt from rural older people will be like a lighthouse to guide me on my journey.

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APPENDIX A

Recruitment Poster

Chinese Version

需要参与者!

武汉市木兰乡的老年人被邀请参加一项研究

如果你是武汉市木兰乡 60 岁到 75 岁的有 1 至 3 年使用社交媒体学习经验的老年人，你可能有兴趣参加由阿尔伯塔大学教育学院的硕士生汪钟睿进行的研究。

该研究是一个 **30 至 60 分钟** 的访谈，以探讨中国农村老年人使用社交媒体作为学习工具的经验、好处和挑战。

联系方式

QQ 号码: 502992458

微信号: wzr13387280869

English Version

Participants needed!

Older adults in Wuhan's Mulan Township are invited to
participate in a study

If you are an older adult between the ages of **60 to 75 with one to three years of learning experience using social media in Mulan Township, Wuhan**, you may be interested in participating in a study conducted by Zhongrui Wang, a master's student in the Faculty of Education at the University of Alberta.

The study is a **30 to 60 minute** interview to explore the experiences, benefits and challenges of using social media as a learning tool for older adults in rural China.

Contact details

QQ Number: 502992458

WeChat Number: wzr13387280869

APPENDIX B**Letter of Initial Contact****Chinese Version**

尊敬的 ：

我叫汪钟睿，是加拿大阿尔伯塔大学教育学院的一名硕士生。我正在进行一项研究，探索中国农村老年人使用社交媒体作为学习工具的经验、好处和挑战。如果你符合以下条件，我诚挚邀请你参加这项研究。

- 位于中国湖北省武汉市木兰乡
- 年龄在 60 至 75 岁之间。
- 有 1 到 3 年使用社交媒体的经验（包括但不限于抖音、微博、快手、QQ、微信等）。
- 使用社交媒体作为学习工具。

如果你同意，将参加一个半结构化的访谈，在访谈中我将提出一系列问题，关于你使用社交媒体学习的经验，包括你使用社交媒体学习的收获和阻碍。面试问题将在面试前通过电子邮件发给你，并将在你选择的时间通过 Zoom 或任何其他视频会议平台进行。访谈大约需要 30 至 60 分钟，并将进行录音。参与是自愿的。为了保护您的隐私，在研究期间和之后，您的身份将保持匿名。

如果你有任何问题或想参加，请通过以下方式与我联系：

- QQ 号：502992458
- 微信号：wzr13387280869

汪钟睿

English Version

Dear _____ :

My name is Zhongrui Wang and I am a master's student in the Faculty of Education at the University of Alberta, Canada. I am conducting a study to explore the experiences, benefits and challenges of using social media as a learning tool for older adults in rural China. If you meet the following criteria, I invite you to participate in this study.

- Located in Mulan Township, Wuhan City, Hubei Province, China
- Between the ages of 60 and 75 years old.
- Have 1 to 3 years of experience using social media (including but not limited to Tiktok, Weibo, Shutterbug, QQ, WeChat, etc.).
- Use social media as a learning tool.

If you agree, you will participate in a semi-structured interview in which I will ask a series of questions about your experience using social media for learning, including what you have gained and what has hindered your use of social media for learning. The interview questions will be emailed to you prior to the interview and will be conducted via Zoom or any other video conferencing platform at a time of your choosing. The interview will take approximately 30 to 60 minutes and will be recorded. Participation is voluntary. To protect your privacy, your identity will remain anonymous during and after the study.

If you have any questions or would like to participate, please contact me through the following ways.

- QQ number: 502992458
- WeChat number: wzr13387280869

Thank you !

Zhongrui Wang

APPENDIX C**Follow up on the recruitment script****Chinese version**

尊敬的 ：

感谢你同意参与这项关于中国农村老年人使用社交媒体作为学习工具的情况的研究。你的经验对促进中国农村老年人使用社交媒体的知识很有价值。

请告知我你是否有空，以便我们能安排采访，以及 Zoom 对你来说是否是一个方便的平台。此外，我还附上了采访问题和同意书的副本，我将要求你阅读并在采访前口头同意。您表示同意的音频将被录音并保存。

谢谢你的参与。

汪钟睿

English version

Dear ，

Thank you for agreeing to participate in this study on the use of social media as a learning tool among older adults in rural China. Your experience will be valuable in promoting knowledge about the use of social media among older adults in rural China.

Please let me know if you are available so that we can schedule an interview and if Zoom would be a convenient platform for you. In addition, I have attached a copy of the interview questions and consent form that I will ask you to read and agree to verbally prior to the interview. The audio of you giving your consent will be recorded and saved.

Thank you for your participation.

Zhongrui Wang

APPENDIX D

Demographic Information.

- Q1. How old are you now?
- Q2. Can you tell me about your family?

Life Background.

- Q3. I know you have some experience of living in the countryside. How long have you lived in the countryside?
- Q4. What do you think the countryside is like?
- Q5. What is it like to live in the countryside? Can you describe it?
- Q6. Can you give a brief description of a day in your life? Are you currently retired or working?

Learning Background.

- Q7. What are some of the social media you use?
- Q8. How did you learn to use social media?
- Q9. How did you learn when you didn't have social media?
- Q10. What were your expectations or assumptions about social media before you used it for learning?
- Q11. As an older learner, why did you choose social media as a tool for learning (why did you want to use this)?
- Q12. At what times in your day do you often use social media? Can you give me an example?

- Q13. What is the first thing you focus on when you open social media?

Learning Behavior.

- Q14. When you use social media for learning, do you use it with a learning purpose? Or do you browse randomly based on your own interest?
- Q15. How does social media play a role in your learning process?
- Q16. What benefits does social media bring to your learning?
- Q17. Can you describe how you use social media for learning, including your own experiences and interactions with others?
- Q18. To what extent were you involved in the experiences you described? Please describe in detail. (For example, did you read learning information posted by others? Did you gather and organize information from various sources on social media platforms? Did you post requests to see how others would respond? Did you respond to requests from others and share resources?)
- Q19. Can you describe a social media account that you viewed the most during your learning process?
- Q20. When using social media for learning, what situations make you feel happy and joyful?
- Q21. In what situations do you feel negative emotions?
- Q22. What troubles do you encounter in using social media for learning?
- Q23. What aspects of using social media for learning did not meet your expectations for learning?

- Q24. Were there any times when social media didn't seem useful to you for learning?

Tell me about that situation.

Learner Perceptions of Knowledge Dissemination.

- Q25. There are many ways to spread knowledge in social media such as video, text, graphics, group discussions, which one do you like best? Why?
- Q26. What is your least favorite way to disseminate knowledge? Why? If you were to modify this method, how would you modify it?
- Q27. What qualities do you like in a social media knowledge distributor? (e.g., friendly, encouraging, calm, good subject knowledge, sense of humor, easy-going, positive answers to everyone's questions, etc.)
- Q28. What qualities do you dislike in knowledge disseminators of social media?
- Q29. What do you think social media could do better to support you in your learning process?

Impact on Learners

- Q30. What impact has your use of social media for learning had on your friends and relatives around you?
- Q31. Have your perceptions of "learning" changed as a result of using social media for learning? How has it changed?
- Q32. How do you think most of your peers feel about using social media as a learning tool?

- Q33. How has the experience of using social media for learning changed the way you learn as an older adult? Please explain.
- Q34. Will you continue to choose to use social media in your future learning?

人口统计信息

- Q1. 你现在多大了?
- Q2. 你能告诉我你的家庭情况吗?

生活背景

- Q3. 我知道你有一些生活在农村的经验。你在农村生活了多长时间?
- Q4. 你认为农村是什么样子的?
- Q5. 住在农村是什么样子的? 你能描述一下吗?
- Q6. 你能简单描述一下你生活中的一天吗? 你目前是退休还是工作?

学习背景

- Q7. 你使用的社交媒体有哪些?
- Q8. 你是如何学会使用社交媒体的?
- Q9. 当你没有社交媒体的时候, 你是如何学习的?
- Q10. 在使用社交媒体进行学习之前, 你对社交媒体的期望或假设是什么?
- Q11. 作为一个年长的学习者, 你为什么选择社交媒体作为学习的工具(你为什么想使用这个)?
- Q12. 你在一天中的什么时候经常使用社交媒体? 你能举个例子吗?
- Q13. 当你打开社交媒体时, 你首先关注的是什么?

学习行为

- Q14. 当你使用社交媒体进行学习时, 你是带着学习目的去使用? 还是根据自己的兴趣随意浏览?
- Q15. 社交媒体在你的学习过程中是如何发挥作用的?
- Q16. 社交媒体给你的学习带来什么好处?
- Q17. 你能描述一下你是如何使用社交媒体进行学习的吗, 包括你自己的经历和与他人

的互动?

Q18. 你在多大程度上参与了你所描述的经历? 请详细描述。(例如, 你是否阅读了他人发布的学习信息? 你是否在社交媒体平台上收集和整理各种来源的信息? 你是否发布请求, 看别人如何回应? 你是否回应了他人的请求并分享资源?)

Q19. 你能描述一下你在学习过程中浏览最多的一个社交媒体账户吗?

Q20. 在使用社交媒体进行学习时, 哪些情况让你感到幸福和快乐?

Q21. 在什么情况下, 你会感到负面情绪?

Q22. 在使用社交媒体进行学习时, 你会遇到什么麻烦?

Q23. 使用社交媒体进行学习的哪些方面没有达到你对学习的期望?

Q24. 有没有什么时候, 社交媒体对你的学习似乎没有什么用? 请告诉我这种情况。

学习者对知识传播的看法。

Q25. 在社交媒体上有很多传播知识的方式, 比如视频、文字、图片、小组讨论, 你最喜欢哪一种? 为什么?

Q26. 你最不喜欢的知识传播方式是什么? 为什么? 如果你要修改这种方法, 你会如何修改?

Q27. 你喜欢社会媒体知识传播者的哪些品质? (例如, 友好、鼓励、冷静、良好的学科知识、幽默感、随和、积极回答大家的问题等)

Q28. 你不喜欢社会媒体知识传播者的哪些品质?

Q29. 你认为社交媒体在支持你的学习过程中可以做什么?

对学习者的影响

Q30. 你使用社交媒体进行学习对你周围的朋友和亲戚有什么影响?

Q31. 你对 "学习 "的看法是否因为使用社交媒体学习而有所改变? 它是如何改变的?

Q32. 你认为你的大多数同龄人对使用社交媒体作为学习工具的看法如何?

Q33. 使用社交媒体进行学习的经历如何改变了你作为一个老年人的学习方式? 请解释。

Q34. 你会在未来的学习中继续选择使用社交媒体吗?

APPENDIX E

Sample of the Original Chinese and English Translations of the Interview Data

The process of translating the interview data in this study was as follows: first, the Chinese interview data were translated into English using deepl translation software. In the second step, the English interview data were collated and checked, and the parts that did not make sense or had a different semantic meaning from the original Chinese text were modified. In the third step, the modified English interview data were translated into Chinese by deepl software and compared with the original Chinese text. In the fourth step, the original Chinese text and the English and Chinese interview data translated by the deepl software were examined, and the phrases with different meanings were modified.

Original and Translation of Sample of Interview Data

Tian Lu/ 天路

Original Interview Data	Translation Interview Data
<p>我们有专门活动、学习的地方，但是统一组织的学习没有那么密，也没有专门的老师，都是村干部兼职的，可能几个月才有一次，比如说防疫知识的普及和政策的宣传。</p>	<p>We have a place for special activities and learning, but the uniformly organised learning is not as intensive, nor do we have special teachers; they are all part-time village cadres, and may be held only once every few months, for example, to disseminate knowledge of disease prevention and policy propaganda.</p>
<p>有的时候会有一些防治病虫害还</p>	<p>Sometimes there are training courses on pest</p>

<p>有防溺水的培训班，但是大部分都是走个形式，每年都讲差不多的东西。老师也不是专业的，就是照着书上的内容念一念，村干部拍个照，大概十几分钟就结束了，还不如我自己在抖音上看看这些内容。</p>	<p>control and drowning prevention, but most of them are just a formality, with the same things being taught every year. The teacher is not a professional, just read from a book, the village cadres take a picture, about ten minutes and then finished, it is better to see the content on my own in the Tiktok.</p>
<p>我和孩子都住在一起，孩子也都大学毕业了，老婆也在上班，工作都挺好.....孩子用抖音比我熟练多了，有时候还要问他们。</p>	<p>I live with my kids, who are both out of college, and my wife is working and doing fine my kids are much more proficient with Tiktok than I am, and sometimes I have to ask them.</p>
<p>它就好像一个所有人都能分享东西的平台，它也不要钱，只要有网络就可以了。</p>	<p>Social media like a platform where everyone can share stuff, it doesn't cost anything either, just have internet.</p>
<p>我主要现在除了工作以外没事了，愿意看看抖音上有什么好的段子和感兴趣的新闻.....那一看我说这么有意思，可以消遣自己的一些时间，而且抖音还挺上瘾的，有时候晚上睡不着觉</p>	<p>I mainly now have nothing to do besides work, willing to see what good jokes and news of interest on Tiktok then take a look at what I said so interesting, can amuse themselves some time, and Tiktok is quite addictive, sometimes</p>

<p>了，一直看到眼睛都干涩了。</p>	<p>can not sleep at night, has been to see the eyes are dry.</p>
<p>我一开始主要是看书，等后来有百度了我就用电脑学习，后来才有你说的社交媒体，我挺喜欢接触新的学习渠道的。</p>	<p>I mainly read books at first, then when Baidu became available I used my computer to learn, and only later did I get the social media you mentioned, and I kind of like being exposed to new avenues of learning.</p>
<p>我应该是这个年龄段群体当中的有知识有文化的人，虽然出自农村，但是一直在和国际接轨，懂得怎样去学习的方法。当时的电脑我也有使用。</p>	<p>I was one of the educated people in my age group, and although I came from a rural area, I was always in touch with the international community and knew how to learn. I also used computers at that time.</p>
<p>主要现在来讲获取信息用微信和QQ 是最多的，学习用抖音和小红书。</p>	<p>Nowadays, I use WeChat and QQ the most for information, and Tiktok and Xiaohongshu for learning.</p>
<p>抖音我用的最多，主要是它比较方便，手指划一下屏幕就可以看下一个视频。</p>	<p>I use Tiktok the most, mainly because it is more convenient, finger stroke the screen can watch the next video.</p>
<p>我开始用 QQ 是公司培训的，因为要用 QQ 和客户沟通，后来就发现 QQ</p>	<p>I started to use QQ is the company's training, because to use QQ and customer communication,</p>

<p>还有学习功能,但是它上面都是一些企业或组织官方的信息,没有什么个人发布的东 西,就没有什么意思。</p>	<p>and later found that QQ also has a learning function, but it is some enterprises or organisations above the official information, there is no personal release of things.</p>
<p>微信有个好处就是它的转发非常方便,而且操作界面也比 QQ 简单,我看到感兴趣的学习内容可以马上发给别人分享。</p>	<p>WeChat has an advantage that it is very convenient to forward, and the interface is also simpler than QQ, I see interested in learning content can be immediately sent to others to share.</p>
<p>你知道老年人对软件的接受程度又慢,我完全不知道怎么操作,后来还是问我女儿才知道基本的操作,再后来自己慢慢摸索就会了。</p>	<p>You know that the elderly to software acceptance and slow, I do not know how to operate, and later or ask my daughter to know the basic operation, and then later on their own slowly fumble will be.</p>
<p>有时候也问同事问题,但是有些同龄的同事自己也不会操作这些社交媒体,年纪小的同事又觉得没有什么共同语言。</p>	<p>Sometimes I ask my colleagues questions, but some of my colleagues of the same age don't know how to operate these social media, and some of my younger colleagues don't have anything in common.</p>
<p>我现在还有工作,肯定先处理工作</p>	<p>I still have a job, so I'm sure I'll take care of</p>

<p>上的事情，在工作时间以外就拿出手机看看，打开抖音学习一下。</p>	<p>my work first, but outside of work hours, I'll take out my mobile phone and turn Tiktok on to learn a little bit.</p>
<p>我喜欢用微信看一些国际新闻，这些东西在聊天的时候用得上，很多新闻别人不知道，就我知道，就觉得自己很有面子，比别人懂得多。</p>	<p>I like to use WeChat to read some international news, these things are useful when chatting, a lot of news other people do not know, but I know, I feel very dignified, know more than others.</p>
<p>我希望用微信看看新闻，原来还可以订报纸看新闻，现在报纸也少了，要找一个新的看新闻的渠道。</p>	<p>I want to use WeChat to read the news. I used to be able to subscribe to newspapers to read the news, but now there are fewer newspapers, so I need to find a new channel to read the news.</p>
<p>比如说讲我今天累了或者喝酒喝多了，躺在沙发上的时候，我就想在微信上看个视频，看篇文章，娱乐一下，再看看一起看的人的评论，了解一些新鲜的事情。</p>	<p>For example, if I'm tired or I've had a few too many drinks and I'm lying on the sofa, I'd like to watch a video on WeChat, read an article for entertainment, and read the comments of the people I'm watching it with, to find out what's new.</p>
<p>当时这些新闻我都记不清楚了，但是别人聊天说起来我还知道是什么事</p>	<p>I can't remember all the news at the time, but I still know what it is when people talk about it.</p>

<p>情。</p>	
<p>我现在发现我年轻时候感觉脑子很好使，现在电话号码我记不住了，这是老年人带来的记忆的下降，但是当我学会用社交媒体之后，想了解的东西马上搜索就什么都有了，学习的过程也可以锻炼我的记忆力。</p>	<p>I now realize that when I was younger I felt like I had a good brain, now I can't remember phone numbers, it's the memory loss that comes with old age, but when I learned to use social media, what I wanted to learn about I searched for everything right away, and the process of learning exercises my memory.</p>

Xiu Cai/ 秀才

<p>我很想参加这种学习班，多学一点知识，但是村里面是没有的，像我们村离镇上又比较远，我知道的很多班都开在镇上，很不方便。</p>	<p>I would love to attend this kind of class to learn a little bit more, but it's not available in the village, and it's inconvenient like our village is far away from the town, and a lot of the classes I know are held in the town.</p>
<p>主要就是开会，每家去一个人，很无聊。</p>	<p>It's mainly just meetings, one person goes to each house and it's boring.</p>
<p>有时候聊天你都不知道别人在说什么，他们就让我去抖音上看看，后来看的多了我也就知道了。</p>	<p>Sometimes you don't even know what people are talking about in chat, so they told me to check out Tiktok, and then I watched more.</p>

<p>我的朋友有时候无聊就去打牌,我不喜欢那个,坐太久对身体不好还浪费钱,我无聊就看看抖音上的新闻。</p>	<p>My friends sometimes bored to go to play cards, I do not like that, sit too long on the body is not good and waste of money, I am bored to see the news on the Tiktok .</p>
<p>我还没有退休的时候就开始用 QQ 了, 但是当时还不知道它能用来学习, 后来知道了用的就比较熟练了。</p>	<p>I started using QQ before I retired, but I didn't know it could be used for learning, but I became more proficient when I learnt about it.</p>
<p>我希望它(社交媒体)可以及时的向我传递一些国际新闻, 因为你知道我原来用报纸学习, 这个就太慢了, 有些事情在国际上发生了, 报纸登出来还要几天, 这就很不方便。</p>	<p>I hope it (social media) can deliver some international news to me in time, because you know I used to use newspaper to study, this is too slow, some things happen internationally, it takes a few days for the newspaper to publish, this is very inconvenient.</p>
<p>抖音就是非常简单, 不需要什么复杂的操作, 只需要点一下就能收藏喜欢的学习内容。</p>	<p>Tiktok is very simple, does not require any complex operation, only need to point to collect the favourite learning content.</p>
<p>QQ 主要还是用来沟通的比较多, 学习很少用 QQ, 它的学习部分做的不好, 非常杂乱, 有时候还卡顿。</p>	<p>QQ is still mainly used to communicate more, learning rarely use QQ, its learning part is not well done, very cluttered, and sometimes lagging.</p>

<p>我对这个（社交媒体）有点兴趣，回家就找我的孙女帮忙，她帮我在手机上安装了软件，帮我注册了一个账号，然后教我怎么用，首先是用什么方法可以找到自己感兴趣的领域，然后教我怎么搜索，怎么保存自己感兴趣的视频，怎么关注别人的账号。</p>	<p>I was a bit interested in this (social media), so I went home and asked my granddaughter to help me. She helped me install the software on my mobile phone, registered an account for me, and then taught me how to use it, firstly what methods I could use to find my area of interest, and then taught me how to search for it, how to save the videos that I was interested in, and how to follow other people's accounts.</p>
<p>没有固定的时间,我什么时候想看了就打开手机看两眼，比如说今天早上我散步回来，想看看关于养老金改革的新闻，我就打开抖音搜索这类的新闻。</p>	<p>There is no fixed time, when I want to watch it, I open my mobile phone to watch a few minutes, for example, this morning I came back from a walk, I want to see the news about the pension reform, I opened Tiktok to search for this kind of news.</p>
<p>因为社交媒体上的新闻都比较新,我就可以在群聊里和朋友分享，这样大家都不知道，只有我知道，就很有成就感。现在有很多朋友手机上也下载了抖音，我们就经常一起在群聊里讨论，联系的</p>	<p>Because the news is newer on social media, I can share it with my friends in the group chat so that no one knows about it but me. A lot of my friends now have Tiktok downloaded on their mobile phones as well, so we often discuss</p>

<p>机会也更多了。</p>	<p>it together in the group chat and have more opportunities to connect</p>
<p>这些社交媒体上有很多专业的厨师，他们的技巧非常专业。比如过年孩子给弄了几条鱼，有一条鲳鱼我没炒过，就赶快上抖音查怎么炒鲳鱼。抖音上面有很多酒店的大厨教我们怎么炒鲳鱼，都非常专业，而且很有技巧。</p>	<p>These social media have a lot of professional chefs, their skills are very professional. For example, my kids got me some fish for Chinese New Year, and there was a pomfret that I had never fried before, so I quickly went on Tiktok to check how to fry pomfret. Tiktok above a lot of hotel chefs teach us how to fry pomfret, are very professional, and very skillful.</p>
<p>我平时在抖音上就看一些新闻和书法方面的东西，看的多了它就记住我的习惯了，现在每次打开都给我推送这些内容，这就挺好的，不用我自己去找了。</p>	<p>I usually watch some news and calligraphy on the Tiktok, watch more it remembers my habits, and now every time I open the push me these contents, which is good, do not have to find out myself.</p>
<p>比如说会获取我的个人信息然后给我打电话，还有一些广告把我想看的视频给挡住了。像这样的情况很多，后来我就经常去找这个手机修理的地方，让</p>	<p>Things like getting my personal information and then calling me, and some adverts blocking the videos I want to watch. There were a lot of cases like this one, and then</p>

<p>别人把我的手机重新调整一下，不要的东西都卸载掉。</p>	<p>I used to go to a cell phone repair place and have someone readjust my phone and uninstall all the software I didn't want.</p>
<p>主要就是这种软件广告特别多,我们老年人又没有什么辨别能力,很容易被骗,我觉得抖音可以给老年人或者未成年人出一个没有广告的版本。</p>	<p>The main thing is that this kind of software ads are especially many, and we older people have little discernment, so it's easy to be cheated, I think Tiktok can come out with a version without ads for older people or minors.</p>

Lin/ 林

<p>现在农村村落比较整齐了,不像原来我们自己建的房子都很散乱,另外农村现在池塘里的污水都清理了,晚上都有路灯,农村的街道也很好,每个村的主干道都是水泥的。</p>	<p>Now the rural villages are more tidy, unlike the original houses we built ourselves which are all scattered, in addition the countryside is now cleaned of sewage in the ponds, there are street lamps at night, and the streets in the countryside are also very good, the main road in every village is concrete.</p>
<p>我们的地都已经租出去了,每年收点租金,平时就在家休息,也有点无聊。</p>	<p>We have all our land leased out and collect a bit of rent each year, and usually just rest at home, which is also a bit boring.</p>
<p>我经常下午找朋友聊天,我们平时聊新闻比较多,都是在微信上看到的新闻,也聊一些生活上的事情,比如说怎么养鱼,谁家鱼养的好,谁鱼塘比较多,谁家的地种了什么,去年挣了多少钱,今年外资形势等等。</p>	<p>I often find friends to chat in the afternoon, we usually chat more about the news, all the news we see on WeChat, but also some things in life, such as how to raise fish, who is good at raising fish, who has more fish ponds, who has planted what on their land, how much they earned last year, the situation of foreign investment this year, and so on.</p>
<p>我每天早晨起来,非常喜欢起床以后</p>	<p>I really like to get up and go for a walk</p>

<p>到室外散步，年岁也慢慢大了，起的也早了，过去养成习惯了，所以还是比较健康。</p>	<p>outside, I'm getting older, I'm getting up earlier, I used to get into the habit of doing it, so I'm still relatively healthy.</p>
<p>现在生活还是总体上比过去一天天是好的，但你得适应，你不能不适应，我的适应能力很强，而且我不抵触新的科技和新的知识。</p>	<p>Life is still generally better than it used to be day by day, but you have to adapt, you can't afford not to adapt, I'm very adaptable, and I'm not resistant to new technology and new knowledge.</p>
<p>我用它（社交媒体）学下象棋，培训班要适应所在区域的情况，比如说这个区域下棋的多，那个区域玩跳绳的多，有很多它教的东西我都不感兴趣，不如这些社交媒体自由。</p>	<p>I use it (social media) to learn to play chess, the training course has to adapt to the situation in the area, for example, this area plays chess more, that area plays jump rope more, there are a lot of things it teaches that I am not interested in, not as free as these social media.</p>
<p>用的多的一个是QQ，QQ主要是闲暇了看看.....另外一个微信，在微信上看图文新闻比较多。</p>	<p>I use a lot of one is QQ, QQ is mainly leisure to see the other is WeChat, on WeChat read more graphic news."</p>
<p>抖音上同一个内容有很多不同的人发表看法，我可以在上面获得对同一</p>	<p>There are a lot of different people expressing their views on the same content on</p>

<p>个事件多个方面的观点。</p>	<p>Tiktok, and I can get views on multiple aspects of the same event on it.</p>
<p>我在 QQ 上学下象棋,但是 QQ 有个问题就是他的象棋板块太隐蔽了,我经常找不到在哪里。</p>	<p>I learnt to play chess on QQ, but QQ has a problem that his chess board is too hidden, I often can't find where it is.</p>
<p>我想看看新闻了就用微信看,它的图文做得还是很不错的,内容也丰富,还可以在下面留言交流。</p>	<p>I want to see the news on WeChat to see, it's still a very good graphic, rich in content, but also in the following message exchange.</p>
<p>朋友就教我了一些基本操作,我们也不是天天在一起,可能有时候碰到了就请教一下怎么操作。</p>	<p>My friend taught me some basic operation, we are not every day together, may sometimes encountered to ask for advice on how to use (social media).</p>
<p>他们主要还是让我不要相信微信和抖音上的广告,少在上面买东西,怕我上当受骗。</p>	<p>They mainly let me not believe in WeChat and Tiktok ads, less in the above to buy things, for fear that I will be deceived.</p>
<p>一般情况下,手机一打开我就先看看抖音,使用频率我没有算过.....估计超过20次。</p>	<p>Generally speaking, as soon as the mobile phone is turned on, I will first look at Tiktok, the frequency of use I have not counted estimated more than 20 times.</p>
<p>我希望每天可以进步一点,至少不要</p>	<p>I hope I can improve a little bit every day,</p>

<p>退步，比如我现在用看社交媒体上的视频学习练字，我当然希望每天字都可以写的好看一些，这样过年大家都请我去写春联，我也有自豪感。</p>	<p>or at least not regress, for example, I am now watching videos on social media to learn how to practise handwriting, and I certainly hope that every day my handwriting can look better, so that I can have a sense of pride when everyone invites me to write spring scrolls for the Chinese New Year.</p>
<p>我还是比较关注各地的新闻,社交媒体上也有很多这种内容,比如哪个地方有矿难,那地方有什么案件。</p>	<p>I still pay more attention to the news around the world, and there is a lot of this kind of content on social media, such as which place has a mine disaster, which place has any cases.</p>
<p>我现在已经通过社交媒体培养了两个外甥写字了,我在抖音上看到感兴趣的书法或者象棋教程就转发给他们。</p>	<p>I've now trained two of my nephews to write through social media, and I forward them calligraphy or chess tutorials I see on Tiktok that interest them.</p>
<p>还有一个就是像买茶叶与它宣传的我感觉有差距。他说了7大罐,但是里头茶叶没那么多,我收到才发现一个罐子里边才15克茶叶。</p>	<p>Another one is like buying tea with what it advertised I feel there is a gap. He said 7 big tins but there wasn't that much tea in it, I received it only to find out that there was only 15 grams of tea in one tin.</p>

Zhang/ 张

<p>老年人活动中心是有的，但是我们老太太很少去的，基本上都是他们老头在里面抽烟打牌。</p>	<p>There is an activity centre for the elderly, but we old ladies seldom go there, basically it is their old men smoking and playing cards.</p>
<p>平时没有什么培训班，也没什么给我们学的，你说我们这种村里面，武汉经济还算可以了，村里面不会给你开什么书法班或者是什么乐器班这种。这种都是我们自己老头老太太自己的兴趣爱好，村委不会掏钱支持我们学习的.....后来我就第一个开始在抖音上学习。</p>	<p>Usually there are no training courses, there is nothing for us to learn, you say that our kind of village, Wuhan economy is quite OK, the village will not give you what calligraphy class or what musical instrument class this kind of. This kind of is our own old man or woman's own hobby, the village committee will not pay money to support us to learn then I was the first one to start learning on Tiktok.</p>
<p>我有三个小孩，都用抖音和微信，小女儿白天上班，晚上是跟我们一起住的。</p>	<p>I have three children, all using Tiktok and WeChat, my youngest daughter works during the day and lives with us at night.</p>
<p>我女儿在抖音上看到别人做蛋糕之类的甜点，就想让我给她做。我不会做蛋糕，只能学着用抖音看糕点师怎么做蛋糕，第一次的时候</p>	<p>My daughter saw people making cakes and other desserts on Tiktok and wanted me to make them for her. I don't know how to make a cake, so I had to learn how to use Tiktok to see how pastry</p>

<p>我做起来不好吃的，然后我又要回去再去看他们的视频。</p>	<p>chefs make cakes. The first time I made a cake it wasn't good and then I had to open Tiktok to watch their videos again.</p>
<p>我是很喜欢和小姐妹聊聊抖音上的新东西的，主要是也比较有趣，可以聊很长时间。</p>	<p>I do love talking to my friends about new things on Tiktok, mainly because it's also more fun and we can talk for a long time.</p>
<p>我是我们村第一个用抖音学习的，后来我的朋友看我用抖音觉得有意思，就一起开始用了。</p>	<p>I was the first one in our village to use Tiktok for learning, and then my friends saw me using Tiktok and found it interesting, so they started using it together.</p>
<p>我在我们那一群小姐妹里面，她们说我是最新潮的，我还能教她们，我也挺开心的。</p>	<p>I'm in our group of friends, and they say I'm the newest, and I'm pretty happy that I can teach them how to use Tiktok.</p>
<p>我从小就喜欢接触新鲜的东西，像戴森的吸尘器也是我们家最先开始用的，原来没有社交媒体的时候我就用百度，当时还是比较新潮的。</p>	<p>I've always been into new things since I was a kid, like Dyson hoovers were the first thing we used in our house, and I used Baidu when there was no social media, which was still quite hip at the time.</p>
<p>我后来发现社交媒体里有这种教做菜的，教你怎么养花的，还有</p>	<p>I found out that there are a lot of social media videos that teach you how to cook, teach you how</p>

<p>养生视频，还有旅游视频都挺多的，这些我都喜欢看。</p>	<p>to raise flowers, and there are a lot of health videos and travel videos, which I like to watch.</p>
<p>我用的最多的是抖音。</p>	<p>The one I use the most is Tiktok.</p>
<p>抖音的推送做得很好的，基本上都是推送一些我感兴趣的内容，如果我看到一个喜欢的视频，点赞和收藏也很方便。</p>	<p>Tiktok does a great job of basically pushing content that interests me, and if I see a video I like, it's easy to like and favorite it.</p>
<p>我用抖音是我女儿手把手教的，我们年纪大了，你不教我们肯定不会的，有时候可能还要多教几遍。比如我想收藏一个视频就叫我女儿教了我三遍，然后她说我这么笨。</p>	<p>I use Tiktok because my daughter taught me by hand, we are older, we surely won't know if you don't teach us, sometimes we may have to be taught a few more times. For example, I asked my daughter to teach me three times when I wanted to favorite a video, and then she said I was so stupid.</p>
<p>用社交媒体学习给我们的聊天提供了话题，原来和我的小姐妹聊天都是聊农村的一些琐事，现在我们也可以聊聊新闻了。</p>	<p>Learning with social media has given us topics to chat about, I used to chat with my friends about rural trivia, but now we can talk about the news too.</p>
<p>我有很多朋友小孩都不怎么回来的，他们的小孩都是在外地的，所以他们也觉得很孤单，年纪越大</p>	<p>I have a lot of friends whose kids don't come home much. They have kids who are out of town, so they feel lonely too, and the older they get, the</p>

<p>越怕孤单。</p>	<p>more afraid they are of being alone.</p>
<p>原来我白天一个人在家里很无聊的，用了社交媒体以后，说实话生活没以前那么枯燥了，你会觉得自己年纪大了也是有用的，也是用因为人老了，最怕就是成为子女负担，这个方面改变确实挺多的。</p>	<p>I used to be very bored at home alone during the day, but after using social media, honestly, life is not as boring as it used to be, and you will feel that you are useful when you are older, because when you are old, you are afraid of becoming a burden to your children, and this aspect has changed quite a lot.</p>
<p>我喜欢把做菜的视频分享给小孩子，如果他们感兴趣的话我就做给他们吃，小孩和老公的认可对我来说也很开心的，你会觉得自己年纪大了也是有用的。</p>	<p>I like to share my cooking videos with my children, and if they are interested I will cook for them. The recognition from my children and my husband is also very happy for me, and you will feel that you are useful even when you are older.</p>
<p>我觉得这些社交媒体保密性做的都不错，比如我登陆都可以用人脸识别，这就又方便又安全。而且都是大公司，这方面应该没有问题。</p>	<p>I think these social media companies are doing a good job of maintaining confidentiality. For example, I can use face recognition to log in, which is convenient and secure. And they're all big companies, so there shouldn't be any problems in that area.</p>
<p>自从我用抖音之后，我收到了</p>	<p>Since I've been using Tiktok, I've gotten a lot</p>

<p>很多诈骗信息，老是给我推荐什么产品，包括诈骗短信我都收到过两次。</p>	<p>of scam messages, always recommending me some kind of product, including scam text messages I've gotten twice.</p>
<p>抖音还是挺不错的，比较好用，主要是它只有一个界面，像 QQ 我现在都不会用，它的界面太多了，太复杂了。</p>	<p>Tiktok is still quite good, better to use, mainly because it only has one interface, like QQ I will not use now, it has too many interfaces, too complicated.</p>

APPENDIX F**PARTICIPANT CONSENT FORM**

Title of Study: Rural Chinese Older Adults Use of Social Media as a Learning Tool

Contact Information

Principal Investigator

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Supervisor

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You are being invited to participate in a study, the results of which will be used in my thesis. Before you take part, a member of the study team is available to explain the project and you are free to ask any questions about anything you do not understand. You can upload or print the document yourself for your records.

Why am I being asked to take part in this research study?

You are invited to participate in this study because you are an older adult from Mulan Township, Wuhan, Hubei Province, China, you are 60-75 years old, and have 1-3 years of experience using social media as a learning tool.

What is the reason for doing the study?

With the proliferation of computers and smartphones in China, a large number of older adults are learning through social media. Social media offer many advantages that traditional learning methods do not. They allow people to connect virtually, making it easier for older learners to access multiple types of knowledge and exchange information. However, little research has focused on how older adults in rural China use social media for learning and the current situation they face in learning. This study hopes to understand the current learning situation of social media-based learning among older adults in rural China, analyze the learning effectiveness of older adults, explore the influencing factors and barriers to social media-based learning among older adults, and explore countermeasures to improve the effectiveness of social

media-based learning among older adults in rural China, so as to create a more appropriate social media-based learning environment for older adults in rural China. It can also provide a reference for the improvement of social media.

What will I be asked to do?

You will be asked to participate in an online one-on-one interview of 30-60 minutes in length. The format of the interview will be semi-structured, in which there will be some interview questions, but can be adjusted at any time to suit the situation. The interview is about your experience using social media for learning, which includes but is not limited to Weibo, Tiktok, Kuaishou, WeChat, QQ. You were chosen because you are a senior citizen in Mulan Township and have 1-3 years of experience using social media for learning. You will participate in the interview through Zoom software, you do not need to turn on the camera, all the interview content (audio) will be recorded. At the end of the interview, the interview will be transcribed through the software and the transcribed data will be stored encrypted on a passworded computer in the researcher's home and backed up on a passworded Google Cloud Drive.

What are the risks and discomforts?

This study will conduct 30-60 minutes of one-on-one interviews, which may cause fatigue for you and you may feel stressed while answering questions. In order to reduce the associated risks and discomfort, the researcher will try to keep the interview as short as possible, provided that sufficient data can be collected. If you become fatigued at the beginning or during the interview, the researcher will provide sufficient time (approximately half an hour) for you to rest. If your fatigue is difficult to relieve in a short period of time, the researcher will communicate with you to choose another date to complete the interview.

If you find certain interview questions difficult to answer during the interview, the researcher will give you enough time to think about it. If the question is still difficult to answer, you may choose to skip it for the next question, which is a common situation in interviews. It is impossible to know all the risks that may occur in a study, but the researcher has taken all reasonable protective measures to minimize any known risks to study participants.

What are the benefits to me?

You may be able to use the interview questions to sort out your own learning experience, identify strengths and barriers you have encountered in using social media for learning, and think about how to make learning more effective.

You may gain some knowledge of adult learning through the interviews that will help you in the future.

While this study may not provide you with any direct benefits in the short term, the results of this study may help us understand the current state of social media use for learning among older adults in rural China and may benefit others in the future.

Do I have to take part in the study?

Participation in this study is your choice. If you decide to participate in the study, you will have two weeks from the end of the interview to withdraw the data you provided. Voice recordings about you and all handwritten notes about your researcher will be destroyed. If you choose to withdraw from the study during the data analysis phase, the analysis derived from your data will also be removed and destroyed. We cannot remove you from the study two weeks after the end of the interview because after 2 weeks the data will be anonymized so it will no longer be possible to delete your data. To withdraw from the study, please contact 502992458@QQ.com.

Will I be paid to be in the research?

You will not receive any compensation for your participation in this study.

Will my information be kept private?

During this study, we will do everything in our power to ensure that all information you provide is kept confidential. No information related to this study (including your name) will be released outside of the researcher's office or by the researcher unless you give your express permission. All information about you will be stored on a computer with a password and will be available only to the researcher. Sometimes, by law, we may have to release information that contains your name, so we cannot guarantee absolute privacy. However, we will make every legal effort to ensure the confidentiality of your information.

To protect your privacy, when your interview is transcribed, we will assign a pseudonym to protect your identity. If you would like to choose your own pseudonym, please indicate that in the interview.

During the interview you will use the Zoom platform, the researcher will not use Zoom to record any data; your audio data will be recorded by recording software and saved on a computer with a password. During data analysis, the researcher will use the software

and at the completion of data analysis, all analysis results will be imported to a passworded removable hard drive and stored in a safe in the researcher's home.

During the study, it is important that the data we obtain are accurate. Therefore, someone from the research ethics committee may view your data, including your name. After the study is completed, we will still need to securely store your data collected during the course of the study. All electronic data will be stored in the supervisor's protected cloud drive and handwritten notes will be stored in a safe in the researcher's home. At the University of Alberta, we keep data for at least 5 years after the study is completed.

What if I have questions?

If you have any questions about the research now or later, please contact zhongrui@ualberta.ca.

If you have any questions regarding your rights as a research participant, you may contact the University of Alberta Research Ethics Office at reoffice@ualberta.ca or 780-492-2615 and quote Ethics ID Pro00126667. This office is independent of the study investigators.

How do I indicate my agreement to be in this study?

You will provide verbal consent to the researcher at the beginning of the interview, when the consent will be recorded. You understand:

- That you have read the above information and have had anything that you do not understand explained to you to your satisfaction.
- That you will be taking part in a research study.
- That you may freely leave the research study at any time.
- That you do not waive your legal rights by being in the study
- That the legal and professional obligations of the investigators and involved institutions are not changed by your taking part in this study.

知情同意书

研究标题：中国农村老年人使用社交媒体作为学习工具

联系信息

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您被邀请参加一项研究。在您参与之前，研究团队的一名成员可以为您解释该项目，您可以自由提问任何您不理解的问题。您将获得此表格的副本以供记录。

为什么邀请我参加这项研究？

邀请你参加这项研究是因为你是一名来自中国湖北省武汉市木兰乡的老年人，你的年龄在60-75岁，并且有1-3年的使用社交媒体作为学习工具的经验。

做这项研究的原因是什么？

随着计算机和智能手机在中国的普及，大量老年人正在通过社交媒体进行学习。社交媒体具有许多传统学习方法所不具备的优势。它们允许人们进行虚拟连接，使年长的学习者更容易获得多种类型的知识并交换信息。然而，很少有研究关注中国农村老年人如何使用社交媒体进行学习，以及他们在学习中的现状。本研究希望了解中国农村老年人基于社交媒体进行学习的学习现状，分析老年人的学习效果，探究老年人基于社交媒体进行学习的影响要素和障碍因素，探讨中国农村老年人基于社交媒体进行学习的效果提升的对策，从而为中国农村老年人创建更适宜老年人的社交媒体学习环境。也可以为社交媒体的改进提供参考。

我会被要求做什么？

你会被要求参加一次时长为 30-45 分钟的在线一对一访谈，访谈的形式为半结构式访谈，在访谈中会有一些访谈问题，但是可以随时根据情况调整。该访谈是关于你使用社交媒体学习的经验，这里所说的社交媒体包括但不限于微博、抖音、快手、微信、QQ。该访谈会选择你是因为你是一名在木兰乡的老年人，且具有 1-3 年使用社交媒体学习的经验。你将通过 Zoom 软件参与访谈，你不需要打开摄像头，所有访谈内容将会被录音。在访谈结束后，访谈内容将通过 NVIVO 软件转录，转录后的数据将被储存在研究者家里有密码的电脑中。在您同意的情况下，研究信息将存储在安全的数据存储库中，以促进未来的研究。

有哪些风险和不适？

本研究将进行 30-45 分钟的一对一访谈，这可能会对你造成心理或身体疲劳，在回答问题时你可能会感到心理压力。为了降低相关的风险和不适，在能收集到足够的数据的情况下，研究者将尽量缩短访谈时间。如果你在访谈开始时或访谈过程中出现身体或精神疲劳，研究者将提供足够的时间（大约半小时）让你休息。如果你的疲劳在短时间内难以缓解，研究者将与你沟通，选择另一个日期完成访谈。

如果你在参访中因为某些访谈问题感到羞愧或紧张。研究者会给你足够的时间来思考。如果问题仍然难以回答，你可以选择跳过这个问题进行下一个问题，这是访谈中常见的情况，不必感到羞愧。在研究中不可能知道可能发生的所有风险，但研究人员已采取所有合理的保护措施，以尽量减少任何已知的风险研究参与者。

对我有什么好处？

你可以借助访谈问题梳理自己的学习经验，找出你在使用社交媒体进行学习时遇到的优势和障碍，并思考如何使学习更有效率。而且你将通过访谈获得一些成人学习的知识，这将有助于你今后的学习。虽然该研究短时间内可能不会给您带来任何直接好处，但这项研究的结果可能会帮助我们了解中国农村的老年人使用社交媒体学习的现状并可能在未来造福其他人。

我必须参加这项研究吗？ 参加这项研究是你的选择。如果您决定参加研究，您从参与研究之日起到访谈结束后两周之内可以改变主意并停止参加研究。关于您的语音记录和所有关于你的研究者的手写笔记都将被销毁。如果你在数据分析阶段选择退出研究，通过你的数据所得出的分析也将被移除并销毁。在访谈结束两周之后，我们不能将您从研究中移除，因为本研究的参与者数量较少，任何一名参与者对本研究都非常重要。要退出研究，请联系 502992458@QQ.com。

即使您留在研究中，您也可以选择在访谈结束后两周之内通过联系汪钟睿撤回您的部分或全部答复。在那之后我们无法删除您的答案，因为你的数据已成为数据集的一部分。

本研究包括一个 30-45 分钟的访谈，在访谈中你不必回答任何你觉得不满意的问题。

我会因为参与研究而获得报酬吗？

你不会因为参与本研究而获得任何报酬。

我的信息会保密吗？

在这项研究期间，我们将尽我们所能确保您提供的所有信息都保密。除非您明确许可，否则不会在研究人员办公室外发布或由研究人员发布与本研究相关的任何信息（包括您的姓名）。有关你的所有信息将被储存在带有密码的电脑中，只有研究者可以使用。有时，根据法律，我们可能不得不发布包含您姓名的信息，因此我们无法保证绝对隐私。但是，我们将尽一切法律努力确保您的信息保密。

为了保护你的隐私，当您的采访被转录时，我们将分配一个假名以保护您的身份。如果您想选择自己的假名，请在采访中说明。如果您希望我们使用您的真实姓名，请在本文件最后一页签署的同意书上注明。

在访谈时你将使用 Zoom 平台，该平台不会记录任何数据，你的音频数据将被录音软件记录并保存在带有密码的电脑中。在数据分析时，研究者将使用 NVIVO 软件，在数据分析完成时，所有分析结果将被导入有密码的移动硬盘中，并储存在研究者家里的保险柜中。

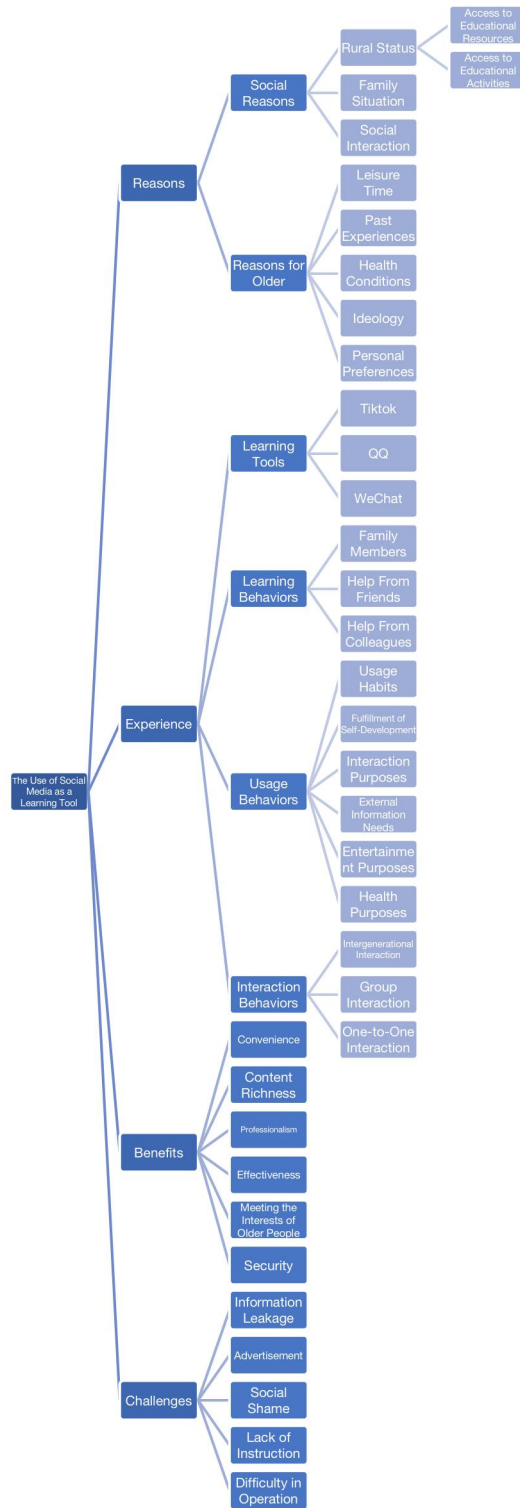
在研究期间，重要的是我们获得的数据是准确的。因此，研究伦理委员会的人员可能会查看您的数据，包括您的姓名。研究完成后，我们仍需要安全地存储在研究过程中收集的您的数据。所有的电子数据将被保存在有密码的移动硬盘中，并和手写笔记一起储存在研究者家中的保险柜中。在阿尔伯塔大学，我们将数据在研究结束后至少保存 5 年。

如果我有问题怎么办？

如果您现在或以后对研究有任何疑问，请联系 **502992458@QQ.com**。如果您对作为研究参与者的权利有任何疑问，可以通过 reoffice@ualberta.ca 或 780-492-2615 联系阿尔伯塔大学研究伦理办公室，并引用伦理 ID Pro00126667。该办公室独立于研究调查人员。

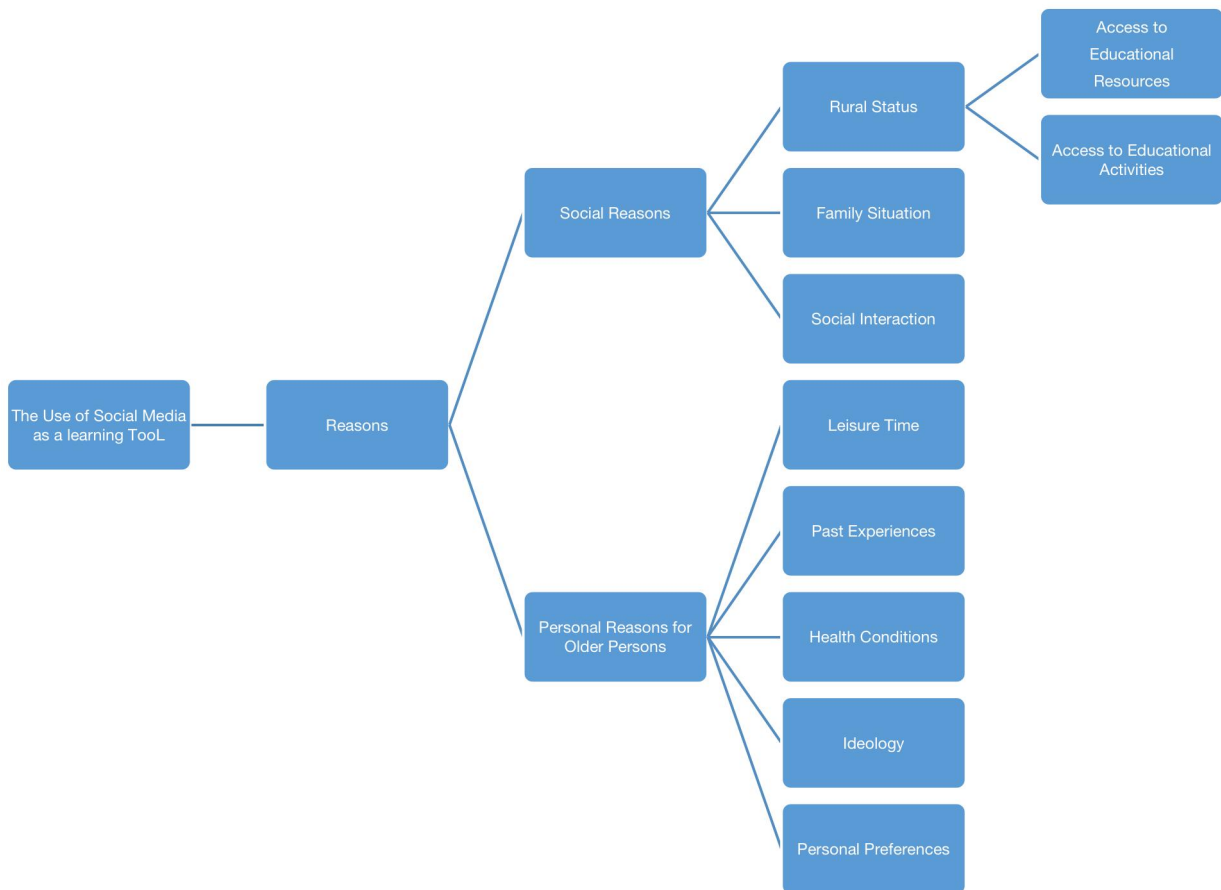
APPENDIX G

Summary of Categories of Grounded Theory

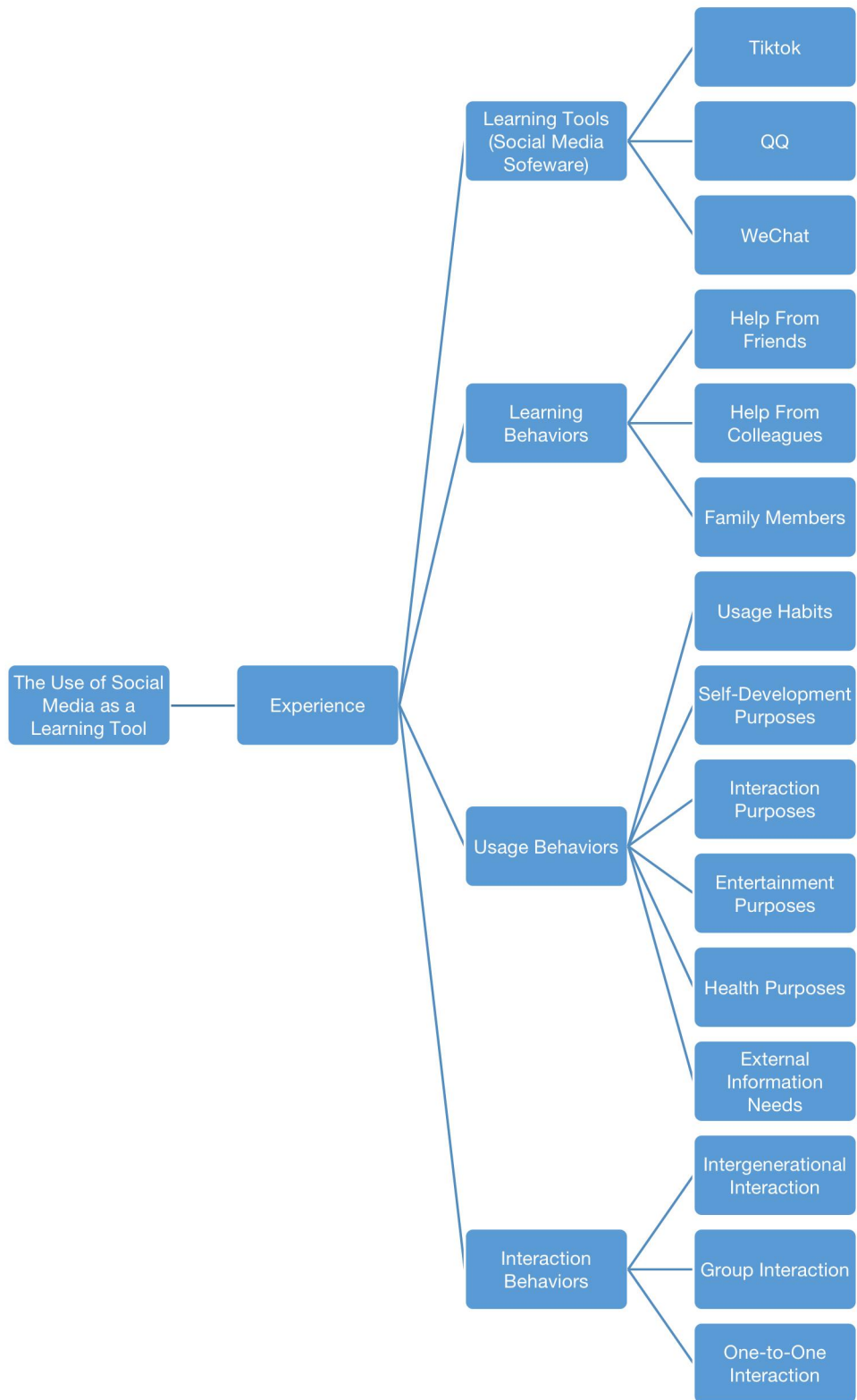


APPENDIX H

Summary of Reasons Categories to RQ1

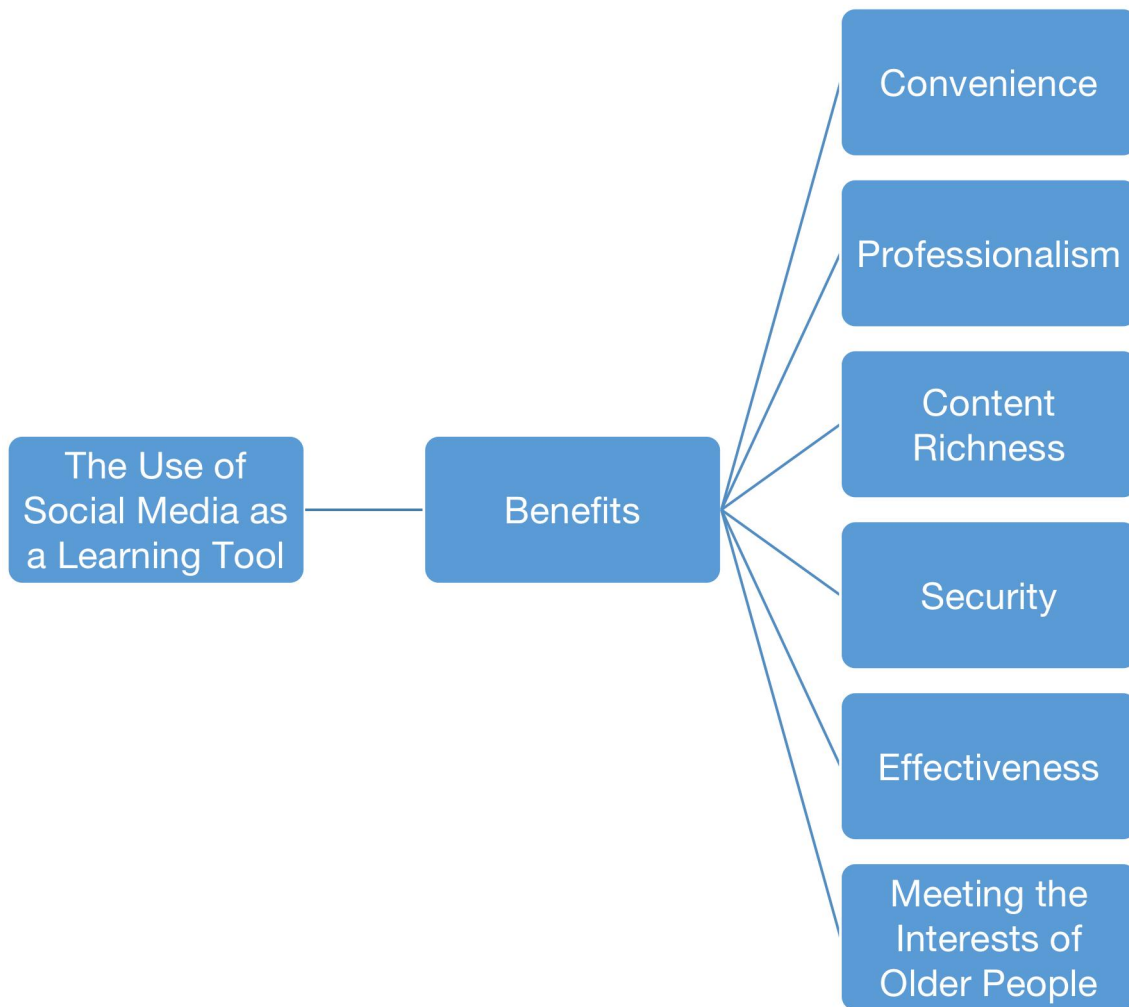


Summary of Experiences Categories to RQ1



APPENDIX I

Summary of Benefits Categories to RQ2



APPENDIX J

Summary of Challenges Categories to RQ3

