How Do Older Adults Learn Informally via Social Media? A Pilot Study of Chinese Urban Older Adults

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Abstract. With the prevalence of social media among older adults, informal learning via social media has become a common and effective approach for lifelong learning and successful aging. However, little research has summarized older users' specific needs and behaviors during learning. Especially, little attention has been paid to the need for self-worth, which is crucial to health and well-being but decreases in old age. Therefore, this study conducted interviews with eight older adults in China to understand their needs and behaviors adopted during informal learning via social media. The results revealed four major needs satisfied by informal learning, i.e., practical needs, enjoyment needs, self-worth needs, and social-connectedness needs. We also identified older adults' cognitive and social behaviors during learning. Especially, the participants emphasized the need for self-worth, but it has not been well satisfied by current social media platforms or much discussed in previous relevant research. Finally, we proposed implications for design and future research about older adults' informal learning via social media.

Keywords: Older adults · Informal learning · Social media · Self-worth

1 Introduction

To promote active and healthy aging, older adults need social connections, self-contentment, and self-growth [1]. An effective approach is lifelong learning. Learning can be either formal or informal [2]. Formal learning, such as learning courses in a third-age university, is only available for a small number of older adults due to the limited educational resources. In China, there were 250 million older adults but only 76 thousand third-age universities [3]. Informal learning is the noninstitutionalized and unstructured learning that occurs in daily life [4]. This self-paced way fits older adults' needs for a leisure style of learning [5]. Informal learning resources are also available on smart devices and social media. Therefore, it becomes more prevalent for older adults to learn informally.

Social media provide a great opportunity for older people's informal learning. A survey in Netherland suggests that 76 percent of 65 to 74-year-olds used social media [6]. In China, WeChat has become a major social media platform for older adults. In

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2020, a WeChat mini program for video editing and sharing, named Xiao Nian Gao, attracted more than 500 million users, of whom most were older or middle-aged users [7]. Over 65% of senior users use WeChat as a source for content consumption, such as reading articles and watching videos [8]. Besides content consumption, some older adults also produce and share their knowledge with online learning communities on social media [9, 10].

Some research identified themes, needs, and social interaction when older adults learned informally on mobile devices (e.g., a literature review [11]). However, some problems remain unsolved and thus hinder better designs of ICT for older adults' informal learning. First, little research has summarized older users' specific needs satisfied by informal learning via social media. Second, informal learning can increase learners' competence and bring a feeling of accomplishment. It potentially enhances self-worth, which is crucial to successful aging [1] but generally decreases with increasing age [12]. However, most previous studies devoted to providing tangible and social support better to older learners [e.g., 14, 15] but paid little attention to their needs for self-worth or self-esteem during informal learning. Third, older adults may take cognitive learning behaviors and interact with others during informal learning via social media, but little research has identified these behaviors and their associations with the feelings such as self-worth and social connectedness.

To better understand older adults' needs and design ICT for informal learning, this study aims to identify (1) the current sources and topics of older adults' daily informal learning and the overall impact on their life, (2) their needs and barriers of informal learning, and (3) their cognitive and social behaviors to learn and interact with others. We conducted a qualitative semi-structured interview with eight Chinese urban older adults (aged 64 to 90 years old) to obtain in-depth and detailed information about relevant phenomena during informal learning.

2 Literature Review

2.1 Older Adults' Needs for Informal Learning and Social Media Using

Researchers have identified older adults' needs for formal and informal learning, including cognitive, emotional, and social needs, by bottom-up methods such as surveys and interviews [11, 13–16]. Some studies suggested differences between older and younger adults. Older adults were motivated more by the needs of knowledge, self-growth, and belongingness but less by the needs of competitions [13, 14]. They had a stronger interest in daily-life topics, e.g., healthcare, hobbies, and cooking [13–16]. They had more experience and wisdom, but their cognitive and physical capacities declined and they were generally less familiar with ICT [17, 18].

Older adults used social media to satisfy their needs for information and social connection. They used social media to receive news and information in time [19]. They interacted with not only family members and friends but also other users online with the same hobbies for a sense of social connectedness [20, 21]. They also created content and expressed themselves on social media to increase self-worth and self-identity and engage in a more meaningful life [22]. However, little research identified what motivated older adults to learn informally via social media.

2.2 Self-worth

Self-worth, or self-esteem, has been found strongly associated with the feeling of social connectedness, well-being, and decreasing death anxiety [23–25]. Self-worth involves two components, i.e., positive self-regard and perceived usefulness [26, 27]. Positive self-regard is the belief that oneself is good. Positive self-regard was seen almost equal to self-worth in some research [28], whereas perceived usefulness or competence was discussed less frequently.

However, perceived usefulness, or subjective usefulness, has been found beneficial to older adults. In long term (several years), perceived usefulness can promote mental health and quality of life and further decrease mortality [29–31]. For Chinese older adults, physical and mental health may be affected more by perceived usefulness than by overall self-esteem measured by Rosenberg self-esteem scale [32], in which most items ask about positive self-regards.

People in the East Asia culture were also found to report lower self-worth measured by Rosenberg self-esteem scale than people in the North American culture [33–35] because of the following reasons. First, self-reported self-worth may be decreased by modesty, a social norm in East Asia [34]. Second, East Asians emphasize and value continued self-improvement and hard working to future goals and thus feel tolerant to a low level of self-worth [36, 37]. Third, East Asians tend to see a person as a member in a community or society, and thus self-evaluation depends more on whether they meet the standards of their social roles [35]. All these phenomena suggest that in East Asian culture, perceived usefulness needs to be studied more.

2.3 Behaviors During Informal Learning

Because of the broad and various definitions of informal learning, it is hard to synthesize the forms and typical activities of informal learning. One of the most widely used frameworks [38, 39] classified informal learning into four forms based on the dimensions of consciousness and intentionality: (1) self-directed learning (both conscious and intentional), (2) incidental learning (conscious but not intentional, e.g., a by-product of other activities), (3) integrative learning (nonconscious but intentional, and can result in sudden insights and "aha" moments), and (4) tacit learning (neither conscious nor intentional, usually during socialization). Similarly, researchers categorized 12 learning behaviors in the workplace according to three dimensions, named intentionality, developmental relatedness (by oneself or with others), and learning competence (mental or actional) [4, 40].

For informal learning via social media, relatedness (individual or interpersonal) may be concerned most among different dimensions. For example, to describe informal learning with mobile devices, researchers developed a survey instrument with two dimensions, i.e., information seeking and sharing [41] based on theoretical models of information searching process and social learning. However, little research explored and summarized the social media-based informal learning behaviors of older adults.

3 Method

3.1 Participants

The participants were recruited by snowball sampling of three types of sources: (1) the authors' social networks, (2) the older adults living in the same community where one of the authors lived, and (3) the older adults who participated in the previous research of the authors' department. We interviewed eight urban older adults living in four communities in two cities in China. Table 1 presents the information of the participants. Six of them were female, and two were male. They aged from 64 to 90 (M = 74, SD = 11). They all had more or fewer health problems but could deal with most activities of daily living independently. They all retired and had education levels at least junior secondary education (middle school). Seven of them lived with their partner or children, whereas P1 lived alone and her children lived close to her community. All of them had been using smart devices with social media for more than two years and spent more than one hour per day on smart devices.

Table 1. Sociodemographic, health status, and behavioral variables of participants.

ID	Age	Gender	Health problems	Education	Household composition	Time on smart devices
P1	85	F	Poor waist, high blood pressure, presbyopia	SV[a]	Lives alone. Her children live near her community in the same city	>1 h/day
P2	64	F	Minor problems, presbyopia	Bachelor	Lives with her husband and children	>1 h/day
P3	64	F	None	LS[b]	Lives with her husband	>1 h/day
P4	68	F	Poor knees and waist, slight presbyopia	LS	Lives with her husband. Her children live in the same city	Most of the day time
P5	68	M	High blood pressure, presbyopia, poor hearing	SV	Lives with his wife. His children live in the same city	Most of the day time
P6	68	M	High blood pressure, presbyopia, poor hearing and one deaf ear	SV	Lives with his wife and children	>1 h/day
P7	86	F	Had a tumor before but recovered, presbyopia	Bachelor	Lives with her husband. Her children live in the US	>3 h/day
P8	90	F	Macula and presbyopia	Master	Lives with her children	>3 h/day

[a]SV: Secondary Vocational School
[b]LS: Lower Secondary School

3.2 Data Collection and Analysis

P1 was interviewed via the video chatting function of WeChat, whereas others were interviewed face to face. P7 and P8 were interviewed together, whereas other participants were interviewed individually. In each interview, we asked questions in the following four major themes:

1. Sources and topics of informal learning: What informal learning topics are you interested in? What sources do you learn these topics from?
2. Motivation, needs, and barriers: Why do you learn these topics? Why do you learn from these sources? What problems did you ever encounter? How did you solve the problems?
3. Behaviors during learning:

    a. How do you search, organize, store, and review the information? How do you practice and apply the knowledge?
    b. Do you interact with others during learning? How and why do you interact with others during learning? Do you share or produce knowledge with others and how?

4. Current physical and psychological status and impacts of informal learning: How healthy are you in general? Generally, are you happy and satisfied with your life, and why? In your daily life, what is changed by the knowledge and relevant technologies?

Each interview lasted for around one hour and was audio-recorded and transcribed to texts later. The interview scripts were analyzed by a thematic approach based on grounded theory [42]. An interview was analyzed as soon as possible. For each theme, data were coded iteratively. Then the codes were categorized as findings inductively, which can be explained and supported by the relevant coded transcripts.

4 Results

4.1 Sources and Topics of Older Adults' Daily Informal Learning

Sources of Informal Learning. Participants obtained information from various ways both online and offline. Social media on smart devices had been one of the most frequently adopted information sources for them. All of them used WeChat every day to connect with others and get information from, e.g., WeChat Moment, articles of WeChat channels, and short videos in WeChat mini programs. Besides WeChat, the participants also got information from news aggregator applications popular in China, such as TouTiao. P2 and P7 also listened to audio-based lectures via applications of audiobooks and radio streaming. Besides smart devices, the participants also got information from traditional sources such as televisions (all the participants), newspapers and books (P7 and P8), community workshops or lectures (P4 and P6), and the third age university (P2, P4, and P7).

Noted that even some non-formal courses of the third age university were offered via WeChat during the COVID-19 pandemic. For example, P7 took a painting course via WeChat group, where the instructor gave step-by-step painting instructions in photos or videos and assigned and commented on every student's homework. Similarly, P2 and P3 participated in the free lectures about piano playing via WeChat.

Topics of Informal Learning. First, most participants wanted to learn about necessary or useful knowledge relevant to their daily life. All the participants learned healthcare knowledge through informal learning, such as diet and Chinese medicines mentioned by six participants, medical knowledge mentioned by four participants, and physical workouts mentioned by P1 and P4. All the participants also learned useful daily-life skills, such as cooking and garbage classification. Second, most participants learn knowledge that can help them better connect with society. All the participants were interested in news and politics from smart devices. P2 and P7 were interested in learning new IT skills for better living. P7 also learned oral English to better communicate with her grandchildren who lived abroad. Third, all the participants learned their hobbies via social media, such as art, music, sports, planting, history, geography, and psychology.

4.2 Needs and Barriers

Practical Needs. All the participants learned for practical needs, such as to get healthcare information (mentioned by all the participants), to solve daily life problems (P2, P3, P6, P7, and P8), and to keep cognitive functions (P1, P3, and P4). Some participants (P1, P5, and P6) said that they only wanted to learn a minimum level of ICT skills that were necessary for their daily life.

Needs for Enjoyment. All the participants learned for leisure, enjoyment, and curiosity about new things. All of them learned to enjoy their hobbies. Five of them said they learned to feel free and autonomous. Three participants (P2, P3, and P7) learned because they were curious and interested in education, new knowledge, and new technologies. Learning is one of P7's hobbies. She even took courses from the third age university for almost thirty years. Because the educational resources for were limited in China several decades ago, some participants were interested in education for compensational reasons:

> *"Our generations had little opportunities of education when we were young. I finished formal education after the graduation of middle school and did not learn much in my childhood. However, now new technologies provide me free and easy access to new knowledge. Meanwhile, I am retired and have a lot of free time. Therefore, I must grasp this good chance to keep updated." [P3, 64 years old]*

Most of them were leisure learners and cared more about positive feelings than learning performance. Therefore, they preferred more flexible ways to learn. They would give up if there were too many complex requirements (mentioned by P1, P3, P7, and P8). Though interested in new technologies, P2 would give up learning if she cannot handle it. P3 said a major reason that she did not take formal courses was that she did not like a strict schedule. Therefore, she preferred learning fragmentedly via social media.

Needs for Self-worth. Third, most participants learned for a sense of self-esteem, self-worth, or values. On the one hand, learning itself can provide promote positive self-regard. Four participants (P1, P3, P4, and P8) said they learned to get busy and avoid a feeling of emptiness. Three participants (P3, P4, and P7) learned to lead a fulfilling life and feel a sense of self-improvement and accomplishment. For example, P7 was proud of getting certifications of completing courses:

"I can get full marks on the exams of the courses I take." [P7, 86 years old]

On the other hand, the participants wanted to become more useful to others. They wanted to learn the trends in society (mentioned by P1, P7, and P8). If they were outdated, they would feel that they were useless and troubling other people. Three participants (P2, P4, and P7) also mentioned that they learned to promote grandchildren's growth:

"I am learning piano playing to feel a sense of accomplishment… Another reason is that my grandson is learning fluting. I want to demonstrate to him that his grandma is still working hard to learn music even though her functions and flexibility have been declined." [P4, 68 years old]

The need to keep self-esteem and be useful to others sometimes hindered participants from learning. P1 and P7 said they gave up learning some ICT skills from their young family members because they did not want to bother their young family members. P4 and P7 also said they hoped to be respected, not ignored or underestimated by others. For example, P4 shared her experience of dropping out of a painting course in the third age university. In a lecture, the instructor commented on the homework of all the students except her, and thus she felt ignored and hurt.

Needs for Social Connectedness. Fourth, most participants learned new things for connections with others and the society. They consumed news and learned politics to keep updated with the society (mentioned by five participants). P2 reposted useful and knowledgeable content on WeChat Moment to help and interact with others. P4 also shared useful content with her friends and family members who could not meet offline.

Other Needs and Barriers. They also needed suitable information display for learning. Almost every participant complained that the small font size on their smart devices. They preferred paper-based assistance for learning, such as manuals for new devices or notebooks (mentioned by P5, P7, and P8). They also preferred multimodal input channels because of their declined vision or audition.

Some factors hindered the participants to learn. First, offline educational resources were limited, but they needed to learn some subjects face to face, such as art, music, and ICT. Second, P6 and P8 had little time for learning because they were busy taking care of their grandchildren or partner. Third, they stopped learning due to physical impairments. For example, P3 used to take a dancing course but quitted it after she got arthritis.

4.3 Behaviors to Learn and Interact with Others

Cognitive Learning Behaviors. The participants obtained and internalized knowledge and skills by searching, browsing, storing, and reviewing the relevant content. Most participants obtained new knowledgeable content from subscribed channels or reposted by their friends on social media. Some of them (P2, P4, P7, and P8) used search engines to find specific knowledge they were interested in, but in most cases, the participants just read or watched what they encountered. Some of them (P1, P3, P4, and P5) relied on the information flow customized based on their view history on WeChat mini programs or other content feeding applications.

Nearly all participants mentioned that they stored or recorded knowledge during learning by smart devices and paper-based notebooks. On the one hand, half of them used the "adding to my favorites" function of social media platforms to store useful articles and videos (P2, P3, P4, and P6). P2 and P4 also used laptops to store and organize the lecture videos of piano playing. However, P3 and P4 also mentioned that it was hard to find something from their "favorites" later for review and practice. On the other hand, most participants relied on paper-based notetaking (P1, P3, P4, P5, and P7). P5 said he kept writing a diary every day and may search for information later by dates. P1, P3, and P7 recorded knowledge on their notebooks chronologically, but P1 and P3 said they wanted to reorganize their notebooks according to the topics.

Social Interaction During Learning. All the participants interacted with others during learning, including their friends, family members, neighbors, past schoolmates, and past colleagues. The participants who took courses online or in the third age university also interacted with their classmates and instructors of the courses (P2, P3, P4, and P7). The forms of interaction include: (1) liking or commenting on others' posts, (2) reposting valuable, interesting, or useful content, (3) discussing homework and Q&A with instructors in WeChat groups (P2, P4, and P7), and (4) posting original content to others by the targeted or directed conversation among users (P2 and P3). When the participants had technical problems during learning online, all of them tend to ask family members or neighbors for face-to-face help first.

The participants rarely produced and broadcasted knowledgeable content on e.g., WeChat moments, or shared their feelings online during learning. There were three possible reasons. First, most participants felt a low self-efficacy in ICT skills and domain knowledge, and thus they thought their experience was not useful or valuable to others (P1, P3, P4, P7, and P8). They kept lurking to avoid bothering others with the overwhelming information. Second, some of them felt it hard to find someone with similar interests, experience, and knowledge background to communicate deeply (P1, P3, and P4). As P1 said:

> *"I always keep silent after reading an article or watching a video… I felt hard to find someone to talk about the content after my husband passed away… but it is not a big problem for me, because I am an introvert. I keep busy by doing handcrafts and I feel fulfilled." [P1, 85 years old].*

Third, some participants (P2, P3, and P6) worried about privacy and Internet fraud, and therefore tended to generate less but consume more content.

4.4 Impacts of Informal Learning on Their Life

From a pragmatic view, most participants suggested that they lead a better, healthier, and more convenient life after beginning to learn anything via social media. From a socioemotional perspective, informal learning via social media made all the participants happier. They could learn more about the world and keep connected with society. Some of them also said informal learning made their life more meaningful and valuable (P1, P3, P4, P6, and P7).

5 Discussion

5.1 Findings

We gave an overview of information sources and topics that Chinese urban older adults were interested in. The three major topics were pragmatic knowledge/skills (e.g., healthcare), knowledge/skills for social inclusion (e.g., ICT skills), and knowledge/skills of their hobbies for leisure, which were consistent with the previous research (e.g., the review [11]).

Echoing these major topics, **we identified older adults' major needs during informal learning**, including practical needs (e.g., obtaining healthcare knowledge), enjoyment needs, self-worth needs, and social-connectedness needs. Among the identified needs, practical, enjoyment, and connected needs have been addressed in previous research [e.g., 7, 9], but self-worth needs are seldomly discussed in the current literature about older adults' informal learning or social media using.

In detail, we found that informal learning via social media may have satisfied older adults' needs for self-worth in the following aspects. First, as mentioned by five of the eight participants, informal learning was an approach to continuous self-improvement, which could promote self-worth especially for East Asians [36, 37]. Second, informal learning of useful knowledge (such as ICT skills) made older adults feel autonomous, competent, and useful to others [43]. It is a major reason why they learned to use ICT and keep updated with trends. Third, during informal learning, a few older adults may share useful knowledge with others and thus promote the feeling of self-worth.

We identified specific cognitive and social behaviors adopted by older adults during informal learning via social media. Regarding cognitive behaviors, older adults may browse and search for new content, store knowledge, practice skills, and apply them in their life, in line with previous research about mobile informal learning [41]. Regarding social behaviors, older adults may like, comment, or repost content useful to others.

However, the participants seldom generated new content or shared their knowledge and feelings with others. A major reason was that they felt low self-efficacy in ICT skills and thus worried that their content might be useless and bother others. Another reason was that older people had fewer needs for identity but more needs for generativity (contributions to younger generations) than young adults [44], whereas self-identity and self-expression were one of the major motivations for generating content on social media [45, 46]. Therefore, older adults seldomly post their knowledge or feelings during learning on social media.

The results of posting were different from some previous studies suggesting that older adults were willing to produce and share their knowledge with online learning communities [9, 10]. The difference may result from two possible reasons. First, these previous studies [9, 10] were conducted in Western cultures, which emphasize the enhancement of self-images more. The participants in our study were all older adults in East Asian cultures, which emphasize one as a member of a community [33, 36]. It may hinder older adults from posting their feelings and knowledge on social media. Second, previous studies was conducted on platforms only for older adults or online networks for hobby learning [9, 10]. However, the participants in our study mainly used WeChat and some of them had difficulty finding people with similar interests. Older adults are probably more willing to share their feelings with peers and people with similar interests, but in China, there is a lack of social media platforms specifically designed for older adults with similar interests.

5.2 Implications for Design and Future Research

First, future design and research for older adults need to pay more attention to increasing the feelings of self-worth and generativity. This study suggests that older adults have strong needs for perceived usefulness to others and the feeling of generativity, but most of them lurk and worry about whether the information they shared is useful or valuable to others. A lack of self-worth even decreased their knowledge sharing behaviors and further hindered older adults' social connectedness and contributions to society.

Some empirical studies have designed workshops or intergeneration communication programs to support older adults' informal learning and the sense of self-worth [47–49]. However, there still lacks knowledge about how to design ICT platforms for older adults' informal learning and enhancement of self-worth. The interviews in this study suggests that older adults' self-worth can be potentially increased by, for example, presenting learning progress or improvement, highlighting their contributions to others, and matching older users with peers who have similar interests. Future research is needed to better enhance older adults' self-worth during informal learning.

Second, future design for older adults may emphasize better user experience more than better cognitive performance. Overall, we found that older adults pursue positive feelings (including self-worth) more. Therefore, to support older adults' informal learning, future design may, for example, design mechanisms or procedures for more flexible and self-paced participation in learning and social interactions.

Third, though we identified several cognitive and social behaviors during informal learning, it remained unclear about the impacts of these behaviors on positive feelings such as self-worth. Identifying the impacts of different behaviors can guide the design of platforms to promote specific behaviors. Therefore, future research may adopt quantitative methods to investigate the actual impacts of different informal learning behaviors on those positive feelings.

5.3 Limitations

First, this study only interviewed eight participants. They were more educated than the current elderly population in urban China. Therefore, they were probably more interested in informal learning and had better ICT skills than the average elderly population in China. Second, learning behaviors were recalled and self-reported by the participants in interviews. To trace their learning behaviors and experience more accurately, future research may adopt other methods such as observations and diary study in long term.

6 Conclusion

This study conducted interviews with eight Chinese older adults to understand their needs and behaviors adopted during informal learning via social media. First, the interviews identified sources and topics in which Chinese urban older adults were interested. Second, it revealed four major types of needs satisfied by informal learning, i.e., practical needs, enjoyment needs, self-worth needs, and social-connectedness needs. Especially, the participants emphasized the need for self-worth, but it has not been well satisfied by current social media platforms or much discussed in previous relevant research. Third, the interviews identified older adults' cognitive and social behaviors during learning. We also proposed design implications and suggestions for future research about older adults' informal learning via social media.

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