The Study of Teaching the Smartphone Using in Taiwan's Elderly Population—A Case Study in Learners of the Senior Citizens Academy in a City of Taiwan

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Abstract. The rapid development of the smartphones, the operation systems and the Cellular network makes the rapid increasing of the population in using the smartphones. The mass production of the smartphones makes the price cheaper, and the using of smartphones is popular. Not only the young people, but also the elderly have begun to use the smart phones and the Cellular network. The office workers use the smartphones and the internet to finish their work, and the elderly use the phones and the internet for convenient life and the connection of their friends and family. More and more elderly want to learn how to use their smartphones and internet. The course in smartphones using becomes more popular in the senior citizens academy.

In this study, we found that the elderly use the smartphones more easily than use the computer. On one hand, the computer using is in home, when the elderly find some problems, they cannot get help immediately. When they have some questions in using smartphones, they will get help easily because they carry the phones with them and they can get help from somebody around them. On the other, the operation of phones is easy than the computer. The using of the smartphones is by fingers, the operating of the computer is by the mouse. To be familiar with the use of the mouse is difficult for the elderly.

We also found that the key point of teaching elderly to use the smartphones is how to use, not how to set their phones. For example, it is important to teach them to use the Facebook by their phones, and it is not very important to teach them how to download the Facebook APP from the Google Play.

It is different between teaching the computer using and the smartphone using. When the elderly come to the academy, the teacher tells them how to read the web, to listen the music, to watch the video by the computer step by step. There are some standard operation processes in using the computer. Now we have to tell them how to use their phone, there are twenty to thirty elderly in one class and they use different brands of the smartphones. The teacher needs to be more patient and teach them one by one.

There are two analysis conclusions in this case study. First, the key point of teaching the smartphones using is the using of the phone or APP, not the phone setting. The phone using is easier than the computer using, but it is still difficult for the elderly to set the user mode or the APP setting on their phones. We suggest that the family or the teacher set up the phone for them to avoid the low learning motivation cause by the difficult setting learning.

Second, we use more individual instruction to replace the group teaching. Our teach content is the using of the Android cellphone. But each participant owns the different brand of the phone. There are slightly differences of the operation between their phones. The group teaching is not the most suitable teaching method. For example, we would teach them how to use the Facebook on their phones by the group teaching, when we teach them how to set their cellphone to take pictures, the individual instruction is more suitable.

We also found an interesting phenomenon in the teaching. When the elderly people are familiar with the phones using and they often use the instant messaging software on the phone. They used to share a lot of messages on the instant messaging software just as health, philosophy of life, etc. But they don't used to check that the information is true or false. They often share the wrong message on their Facebook or LINE (an instant message software, it is like What's APP) because they don't know the message is wrong. The teacher has to tell them how to distinguish between true and false messages.

Keywords: Smartphone · Cellphone · Elderly · Elderly learning

1 Introduction

The smartphone is a mobile phone that has an independent operating system that can be extended by installing the applications, the games, and the other programs. Its computing power and functionality are superior to the traditional mobile phones. The cellular network, also known as the mobile network is a mobile communication hardware architecture, divided into analog cellular network and digital cellular network. Since the signal coverage of the communication base stations constituting the network coverage is hexagonal, the whole network is named after a cell. When the smartphone and mobile network are combined, our modern digital society is established. When we don't know where we can eat delicious dinner, watch the movies, we used to take our cellphone, and connect the internet to find the information.

The senior citizens academy organize the information application courses in 2008. The candidates must be over 65 years old. The elderly registration is very enthusiastic, because the computer, the Internet is the new technology for them. They know that the new technology would help them to live better. In recent years, under the development of the smart phones, with the mobile network technology, elderly people are eager to access the Internet any time, as the young people around them. So the senior citizens academy organize the course about the cellphones. In the course, we found that a lot of elderly use their cellphone to watch videos on YouTube, to share their pictures on Facebook, to transfer their live on the instant message software like WeChat, Line.

According to our observation, about 10% to 20% of the elderly can use the smart phone independently when the course is completed and they own the ability to search for the information they need on the Internet. 60% to 70% of the elderly can use the instant messaging software to send and receive the messages by the cellphones. About 10% of the elderly are still not familiar with the use of the network when the course is completed.

According to the statistics of the National Development Council of the Republic of China in 2016, the ratio of people over 60 years old using the smartphone to the Internet is 34.8% in 2016, 4.3% growth over 2015. We found that the elderly population also has the demand for mobile Internet, and the demand is increasing year by year.

It is the motivation of this study to create a high-quality learning environment, to reduce the learning burden of the elderly and to improve the learning intention.

2　Literature Review

According to the statistics of the population of Taiwan in December 2016, the total population of Taiwan is 23539816 people, and older than 65 years old population is 3106,105 people, the proportion of the elderly population is 13.20%. In other words, Taiwan will become the aged society in recent years (Ministry of the Interior, Taiwan, ROC 2017). The problems faced by the elderly population will be the focus of our attention.

Elderly education is the teachings of the elderly, and is also a part of adult education (Wang 2004). The 21st century is a lifelong learning century, human beings in order to adapt to the needs of social change must learn four basic learning (Delors et al. 1996): learning to live together, learning to know, learning to do, learning to be. In 2011, when the birth of the first baby boomers in the United States entered the age of 65, it immediately highlighted the importance of Pre-Retirement Education (PRE), which helped individuals to transition from a job role to a retirement role to reduce their likelihood resulting in poorly adapted problems (Anna 2009). The United Nations Educational, Scientific and Cultural Organization (UNESCO) specifically defined that for elderly people, elderly education plays a very important role, emphasizing that elderly educators can no longer look at the problem of the elderly in the context of welfare services, but that learning should be seen as a part of their life.

Through the above literature, we can find that life-long learning is important for elderly people. It would help elderly people to face the transformation of the social roles.

In recent years, Internet continues to develop, not only young people but also elderly people want to learn how to get information in the Internet. In fact, elderly people do not like the imagination of the exclusion of the computers, they are very sure that science and technology affect the multi-level life and the network plays a message communication, contact feelings. For the elderly, the computer is a useful personal tools (White and Weatherall 2000). There is no friendly interface in the use of the network environment and the network equipment. In the development of the Internet and more new media, older Internet learners are vulnerable to social marginalization (Cai and Zang 2003). American scholar Hodse and Lindberg (2002) have also considered the future of the United States in the era of aging, and therefore proposed for the elderly who envisioned web design guidelines: Make your website senior friendly, stressed that any design should consider the actual physiological condition of the elderly.

Through the above literature, we, realize that the elderly is sure about the convenience from the technology, but the design of the operation interface is not friendly for them. An unfriendly interface will lead to the difficulty of learning for the elderly and reduce the willingness to learn. In the process of information education for the elderly, we must think about how to lead the elderly in the unfriendly operating environment to learn and bring their life convenience.

3   Research Methods

Action Research is a process of self-reflection inquiry in the social or educational context. Participants included teachers, students, principals and others. The research aims at rationality and justice of social or educational practices. It helps researchers to understand the practical work, and makes works more efficiently (Carr and Kemmis 1986).

On the teaching part, Action Research is a research method for educational environment. Its purpose is to understand the quality of teaching and looking for a better way to teach (Hensen 1996). It includes the observation of the teaching process, finding and solving the problems, and is a systematic and sequential method for research (Dinkelman 1997).

According to Johnson's book (A Short Guild to Action Research); he pointed out ten characteristics about Action Research:

- Action research is a systematic researching method.
- The researchers have no any presumptions.
- It is not necessary to get the way of research complex.
- It needs detailed plans to collect data.
- The research is no time limit.
- Regular observation is necessary, but it is not necessary to spend a lot of time on observation.
- The research process can be simple and informal, and it can be rigorous and formal, too.
- Action Research requires theoretical foundation.
- Action Research is not a quantitative research.
- When the research result is quantitated, the application of the result will be limited.

The object of the study is 89 elderly students attending the computer courses in the Senior Citizens Academy. The author is the course instructor, his jobs are teaching the elderly students to use the internet, to read the messages on the screen, to input the words (Traditional Chinese characters), etc.

Why did we use the method of Action Research to run the study? We would find something different between the basic research and Action Research (Wang 1997).

	The basic research	Action Research
The training that the researcher need	Researchers need to learn measure, statistics and other methods	Action Research do not need the strict training. The practicing workers would run the study with the help of other academics
Purpose	Research conclusions can be widely used, the purpose of the study is to develop theory and verification theory	The findings can be applied to the specific work environments where participants can conduct on the job training at the same time
How to find the question	Researchers use a variety of ways to define the problem, but usually they are not directly involved in the research issues	The problem defined by the researcher is a problem in the real environment that causes the researcher to plague or affect the efficiency of the work
Hypothesis	Develop specific assumptions and operational definitions that can be tested	The solution to the problem is often regarded as the research hypothesis. Theoretically, the research hypothesis must be quite rigorous
Literature review	The researchers must have a broad understanding of the current state of knowledge in the field of research, and understand the results of others' research	It is not strictly required the researchers study the data completed
Sampling	The researchers obtained the random or biased samples from the study maternal	The practitioners usually find the teachers and the students in the working environment or themselves as research subjects
The design of the experiment	It is needed to plan before the study running. It is necessary to reduce the errors and the irrelevant variables	The researchers change the way they do during the study to find out that if such changes can improve the working environment. The experimental condition control and error prevention are less important. But the researchers are in the research situation, there may be biased position
Measuring	The researchers choose the most efficient and accurate assessment tool. These assessment tools will be tested before the study takes place	The choice of the measurement tools is less rigorous, the participants lack the use of the measurement tools using training, but they can be assisted by the professional scholars to run the study and find out the results
The analysis of the data	The analysis of the results in the study is one of the purposes of the study, so the research data must be	The research data are analyzed briefly, emphasizing the practicality and feasibility of the

	The basic research	Action Research
	complex analysis. The use of statistics is very important	research results, rather than presenting the results with a large number of statistics. The researchers attach importance to the information and advice provided by the participants
The application of the research results	In general, the results can be widely used. But in fact, many of the findings can't be applied to the educational environment. The difference between the experience of the researcher and the practitioner creates a serious communication problem	The results of the study can be applied immediately to the practical working environment. But the application of the results is limited, cannot go beyond the scope of the researchers control

Synthesis of the above literatures, there are some reasons that the study was conducted by Action Research.

First, in Action Research, the teacher is also the researcher. In the process fo research, the teacher can take this opportunity to reflect on the content and methods of teaching.

Second, for the research purposes. The purpose of the Action Research can be applied to the specific work environments and improve the method of the teaching and the learning outcomes.

Third, Action Research do not need the strict training. Everyone find some problems, and find some methods to solve. When it is necessary, we can seek the expert assistance.

So, this study run in Action Research.

4   Results

In this study, we find two results.

First, it is important to teach the elderly how to use their cellphones to make their life easily. It is important to teach them how to find and download some interesting APP to make their photos beautiful. It is not important to teach them how to set their cellphones.

To the physical condition of the elderly, their memory capacity is reducing, so it is easier to forget the content of the class. For example, we teach the elderly how to set the Wi-Fi connecting this week, and next week we need to remind them how to do the same thing, or we need to teach them again. They would forget to find the setting on the cellphone to connect the Wi-Fi. So we need to make some notes for them one by one because they don't own the cellphones of the same brand. It is important to teach them how to wake to cellphones up (When we don't do anything on the cellphones in 15 or 30 s, the phones will shut down the screen, and the elderly don't know how to use their

fingers to slide the screen to wake the phones up in the beginning of the class.), but it is not necessary to teach them how to set the time change about the screen sleeping because some of them will forget how to make the setting and they will feel troubled. In the first few weeks of the course, we will take them to make some setting that they will use often in the course, for example, to set camera saving the phones in the SD Card. And we will teach them how to connect the network with their cellphones. When they forget the setting, we have to be patient to make the setting for them just like their sitter but not their teacher. Some of the elderly live home alone and their sons and daughters live in another city, so the teacher has to teach them, and has to play the role of the son or the daughter to help the elderly keep on learning sometimes.

Although the elderly's memory capacity is reducing, but some APPs are helpful for their life or for us to take care of their lives. For example, they often transfer the messages by Line APP (an instant message software, it is similar to What's APP). They would show some photos on the Line. When we read their messages, we would know that they are fine and they would feel happy and the sense of accomplishment. They would find some help on the Line also just like that where they can buy something or where they can eat delicious lunch at noon. So we understand that the key point of the teaching is that the using is more important than the setting. It is important to teach them how to transfer the messages by Line but not how to install the Line APP.

Second, we use more individual instruction to replace the group teaching. As we know that every elderly in this course owns his cellphone, so there are many different brands of the cellphones in the class. Although the teaching content is based on the Android system, but there are little differences between the cellphones. The course is going on three hours in a week, and we spend almost half an hour to solve the individual problems. For the reason, we take the individual guidance time every month to solve their problems. We try to do so and find two advantages at least. First, they would not give up learning so easily because of the problems, and they would feel happy because that the teacher cares about their problems and he would spend more time to solve it for them. At the same time the teacher would encourage them to keep learning and make them feel better. Second, the course is going well because we would not stop the course to solve the individual problems. We would solve the problems for them immediately and explain the problems in the individual guidance time. There is an additional advantage in the way: the relationship between the teacher and the elderly would be closer because that the teacher have more time to explain the problems for the elderly and to care for his students.

The individual guidance time makes some elderly and the teacher feel good. The elderly feel ashamed of their questions and don't want to ask questions in front of the classmate because they think their questions are so easy to others. In the individual guidance time, they would feel relax and discuss their questions freely because there are no other classmates watching them and make them nervous. The teacher would run the course smoothly and would not stop the course again and again for just one or two elderly. He would solve the problems intently for the elderly in the individual guidance time.

In this study, we also find that the operation system on the cellphones (Android and iOS) use some professional vocabularies, and it is not the friendly interface for some elderly. The elderly is used to operate the cellphone in the standard thinking. If they would change the picture on the cellphone desktop, their thinking is: first, press the

setting icon on the right corner, second, find the display option… etc. But if the position of setting icon changes, they would not know how to operate. In another words, some of they are not used to read the words or don't understand the meanings of the words on the screen. They used to operate the cellphones by memory. If they forget something, they have to get some help. So we suggest that the text used by the system can be more friendly, and we also take the elderly to read the words on the screen, to understand the meanings of the words. It is difficult for the teacher and the elderly. It takes some time to solve the problems, and it is not necessarily to solve the problems. However, we have to try.

There is another interesting finding in the study. When the elderly are familiar with the phones using and they often use the instant messaging software on the phone. They used to share a lot of messages about the health, philosophy of life… on the instant messaging software. But they don't used to check that the information is true or false. So we found that the famous online rumors is shared on the Line. The content of the rumors is about the free gift (just like the key ring). The gift is loaded the tracker, if we take the gift, we also take the tracker with us and make us dangerous. It is a famous rumors in 1970 years, but now it is shared on the Line and make the elderly be afraid. Another rumors is that it is helpful for the cancer patients to drink spirits drinks because the Alcohol will eliminate the cancer cells! To share the messages is very good for their life and inter-personal relationship, but if the messages is wrong, it maybe cause the unnecessary panic. So we have to tell the elderly that how to recheck the correctness of the message.

5   Future Research Directions

1. For the cost considerations, there are more than 25 elderly in a class to learn together. If the students are less than 20 persons in a class, whether the effectiveness of teaching can be improved?
2. We are planning to reduce the weekly class time from three hours to two and an half hour, and there are 30 min to run the individual guidance time. Whether the increase in the individual guidance time would improve learning outcomes?
3. The vocabulary on the cellphones is the same. The factory don't replace the word for the different people. In our country, it is a trouble for some elderly because they don't understand the meanings of the words. Whether the same situation happen in other countries? How do they solve the problem?
4. We are running the new course for the elderly in the day care center. We don't teach them how to connect the internet or how to read on the tablet PC, but we take them to play simple games on the tablet PC. It is not necessary to read words, all the elderly need to do is to distinguish the graphics and the colors, and use their fingers to remove the objects on the screen to finish the games. The elderly in the day care center are over 80 years old, and someone lost the ability of live independently, and someone is illiterate, and most of them have lower active ability. Whether the course help them to live better? Is it possible to combine the courses with medical care as a rehabilitation tool?

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