

Research on Strategies to Improve the Information Technology Capability of the Elderly——Based on “Post-production of Photography” Teaching Practice at Universities for Elderlies

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Abstract: With the deepening of aging population and the development of smart cities, the contradiction between the low information technology capability of the elderly and the higher demand for information technology education is increasingly prominent. This paper analyzes the basic level of information technology, learning pathways and factors that affect learning through statistical surveys. In this paper, information-based teaching methods are used to carry out targeted teaching practices and explore strategies for improving the information technology capabilities of the elderly.

1. Research Basis and Purpose

According to data from the sixth national census, as of 01:00 on November 1, 2010, there were 177,594,400 people aged 60 years and over, accounting for 13.32% of the country’s total population. Thus, China is already in an “aging” society. ^[1] However, with the development of information technology and smart cities, social life is increasingly dependent on smartphones and computers. In order to adapt to life in the digital age and enjoy the convenient services provided by a smart society, the elderly must first improve their information technology capabilities. Faced with the aging of the population and the smartening of the city, the contradiction between the low information technology capability of the elderly and the higher demand for information technology education is increasingly prominent. Therefore, how to effectively improve the information technology capabilities of the elderly is an issue worthy of further study.

2. Investigation into the Current Status and Statistical Analysis

This research is to use the students of Huludao Senior Citizen University as the sample for investigation. Among them, photography and post-photography courses have a high correlation with information technology capabilities, so students at the photography classes and post-photography classes are selected as measurement samples. A total of 60 questionnaires for the Survey of Huludao Senior Citizens’ Information Technology Capability were issued, 59 were returned, the overall recovery rate was 98.33%, 58 were valid questionnaires, and the effective recovery rate was 98.31%. The basic information statistics of the interviewed elderly people are as follows: 22 males and 36 females.

The survey measurement data statistics show that 62.1% of the elderly did not use a computer to work before retirement, so the proportion of being able to independently use a software in the computer is not high (29.3%); with the rise of smartphones, the vast majority of elderly people choose to use smartphones instead of computers. 89.6% of the elderly respondents often use smartphones, and 79.3% of respondents like to learn new software or mobile apps; 94.8% think it is necessary to learn to use a computer or smartphone, but most of the elderly people interviewed cannot learn to use a software or mobile APP in a computer by themselves. Although the effect of self-study is not satisfactory, in the study of learning pathways (Figure 1), most of the interviewed elderly choose self-study pathways; In the survey of “the main reasons affecting the use of computers or smartphones in learning (Figure 2)”, 26% of the cases have no learning pathways, and 51% of the personal physical reasons are important factors that need to be overcome in elderly

education.

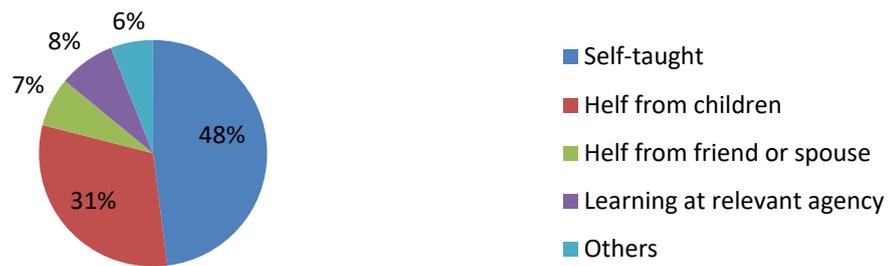


Figure 1 Paths for Learning to Use a Smartphone or Computer



Figure 2 Main Reasons Affecting Learning to Use a Computer or Smartphone

3. Teaching Practice

The “Post-Photographic Production” course is different from other courses offered by senior universities. It requires the use of computers as teaching equipment and learning tools. In the learning process of the training operation content, each operation step is very important. Once the elderly students miss a step, the entire operation cannot be performed. The basic class is for students who have no computer foundation or a weak computer foundation. In the upgrading class, based on the computer application of the elderly students, the system learns the Lightroom software to modify the photos and other content. Through the photography case analysis and the comprehensive application of the software, it improves the elderly students’ post-photography level, and then enhances the information technology capabilities of the elderly.

3.1 Analysis of leaders’ characteristics and learning demands

Before signing up for the photography post-class study, the vast majority of senior students have a clear understanding of their learning needs and a correct understanding of their information technology capabilities. Therefore, the elderly learners have clear learning goals, rich learning experience and strong self-control ability, so they participate in teaching decision-making, and pay attention to teaching efficiency. However, due to their physical, mental, and information technology abilities, their memory is reduced, their speed of accepting new knowledge is slow, and their knowledge transfer ability is poor. ^[2]

3.2 Face-to-face teaching at class

Based on the analysis of learner characteristics and learning needs, teachers take 2 hours of teaching time per week as one teaching unit, and then subdivide the teaching content in each teaching unit into more than two interrelated theoretical knowledge or practical training operations. The teacher adopts group teaching based on the principle of proximity, and selects students with a stronger learning ability in the group as the study leader to assist the teacher in teaching in class.

The Advantages and Disadvantages of Classroom Teaching of “Post-production of Photography” at Universities for Elderlies:

1. Informatization teaching facilities are complete. Huludao Senior University established a new

computer room in early 2017. The configuration of the student computer and the teacher computer is relatively high, which fully meets the requirements for the computer's operating speed during the training operations in the class. Configure a 75-inch interactive touch all-in-one for teachers to facilitate students to watch teachers' demonstrations at class.

2. Traditional blackboards play a supporting role. Teachers' blackboard writing is indispensable in the class. The important and difficult points and brief operation steps must be listed on the blackboard one by one to help students understand and master new knowledge.

3. Students' attendance affects their learning outcomes. Face-to-face classes are limited by time and place, and elderly students are restricted by family, body, work, etc., making attendance rates an important factor affecting learning results.

4. Class practice time is relatively inadequate. Because the elderly students are relatively slow in movement, their receptive ability and reaction speed are not high, making the practice time in the class relatively insufficient, the teacher can only solve this problem by extending the time of the lecture.

5. Traditional class teaching limits "special students". For example, Yuan, a senior student, has relatively strong information technology skills, but his poor hearing ability directly limits the effect of his classroom learning. Hearing aids and front seats cannot solve this problem.

3.3 After-class review

After-school review is a necessary supplement to face-to-face lessons of only 2 hours per week. Teachers use the WeChat public account platform to apply for the establishment of a WeChat enterprise account "Golden Small Classroom", and self-built 2 applications of "Basic Photography Post Production Class" and "Photographic Post Production Improvement Class" (Figure 3). In this way, all elderly students can be added to the enterprise number, and learning resources such as text, graphics, pictures, videos, and documents can be produced. The learning resources are sent to the students through group messaging. The students receive the learning resources in the smartphone "Corporate WeChat" APP.



Figure 3 Self-built "Golden Small Classroom" APP

At present, the learning resources in the "Golden Little Classroom" are mainly graphic and textual, and a multi-graphical and textual resource will be established for the weekly teaching content (Figure 4). At the end of the weekly lectures, teachers will send weekly review materials to students through the enterprise number. This novel way of pushing resources for after-school review allows students not only to learn about the installation and use of the APP, but also to be exposed to information-based learning methods, which will further improve the information technology capabilities of older students.



Figure 4 “Golden Classroom” Multi-graphic Review Materials

3.4 Learning Effect Feedback

There are a total of 50 students in the basic and improvement classes of photography post-production (including 23 in the basic class and 27 in the improvement class). For the feedback of learning effects, a combination of questionnaire surveys and interviews was used. Thirty-five questionnaires were collected from the Survey of Learning Effects of ‘Photographic Post-Production’ at Huludao University for the Elderlies with a recovery rate of 70% and 34 valid questionnaires with an effective recovery rate of 97.14%.

The data obtained from the measurement samples of older students are assigned (Table 1).^[3] Statistical analysis was performed using the SWOT analysis method. The X-axis of the coordinate axis represents the personal basis, and the Y-axis represents external factors. The sample distribution is shown in the blue dot in Figure 5. Students with both personal and external advantages are distributed in the first quadrant, students with personal disadvantages and external advantages are distributed in the second quadrant, and students with personal and external disadvantages are distributed in the third quadrant. Students with personal strengths and external disadvantages are distributed in the fourth quadrant, and a small amount of data is scattered on the coordinate axis. Self-assessment according to the students’ mastery of teaching content, and re-assign the sample data: all learn (X + 2, Y + 2), learn 80% (X + 1, Y + 1), learn 50% (X-1, Y- 1) Learn only a few (X-2, Y-2). The red dot in Figure 5 indicates the learning effect of the elderly students: the first and second quadrant samples showed an overall upward trend; the vast majority of the samples in the fourth quadrant and its coordinate axis showed an upward trend; the third quadrant and its sample on the coordinate axis showed an increase trend.

Table 1 Value of Personal Basis and External Factors

Personal Basis	2	1	-1	-2	External Factors	2	1	-1	-2
Gender		Male	Female		Absence	No absence	Absent for no more than 4 classes	Absent for 5-9 classes	Absent for more than 10 classes
Age	50 years and under	51-60	61-70	Above 70	“Golden Small Classroom” Usage	Often	Sometimes	Seldom	No
Education	Bachelor and above	Junior college	High school, technical secondary school, vocational high school, technical school	Junior high school and below	Is there any help after class	Often find someone to help	Have the help of some others	Seldom have others' help	No help
Computer foundation	Very good foundation	Good foundation	Little foundation	No foundation	Psychological stress from learning	Some stress at the beginning of learning, slowly learn to reduce stress	A little bit stressful in learning	Seldom have stress	Always have huge stress

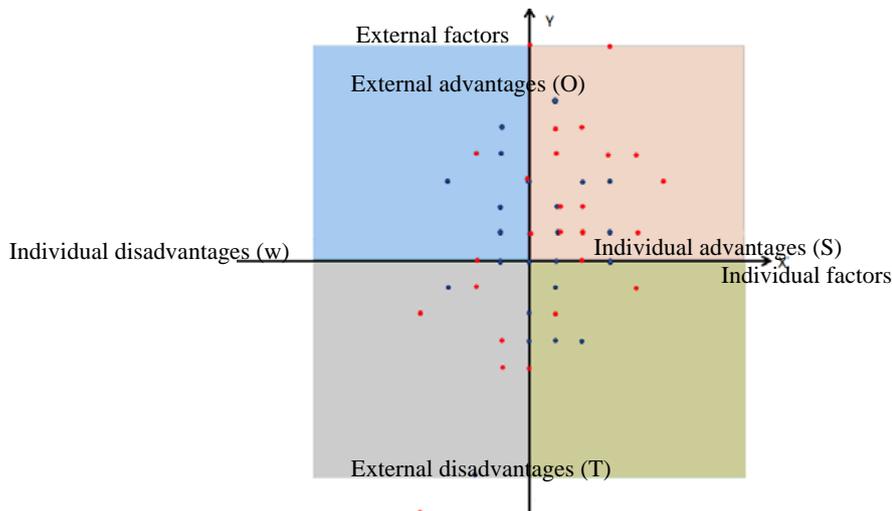


Figure 5 SWOT Analysis

It can be seen from the SWOT analysis that the learning effect of the first quadrant sample with both personal and external advantages naturally shows an upward trend; the second quadrant sample overcomes personal disadvantages and gives play to external advantages in the learning process. In the learning of the fourth quadrant, although there are personal advantages, external disadvantages affect the learning effect, so some students do not improve well, and some students have poor learning results; the third quadrant sample has a double disadvantage. To improve the learning effect, we must overcome external disadvantages and actively participate in face-to-face

teaching.

“Post Production of Photography” is not only a course for professional software use, but also a window for the elderly to receive information education. It aims to improve the information technology ability of older students and transfer the knowledge of this course to self-study of other software or APP.

4. Improvement Strategies and Research Prospect

According to the data analysis result of “Investigation into the Current Situation of Elderlies’ Information Technology Capabilities in Huludao” and “Investigation into the ‘Post Production of Photography’ Learning Effect at Hududao University for the Elderlies’ and combined with the “Post Production of Photography” classroom teaching experience, the strategies to improve elderlies’ information technologies are summarized as follows:

1. Use information-based teaching methods to overcome the elderly’s influence on learning due to physiological aging. [4] For example, the use of large-screen teacher machine, projection or electronic classroom software in class to overcome the impact of reduced vision of the elderly; install indoor audio, teachers wear microphones or voice conversion software to overcome the impact of reduced hearing of the elderly; refine the teaching content, often review and practice, to overcome the effects of memory loss of the elderly; for the elderly who cannot go out to study or are in the first quadrant in SWOT analysis, try online learning.

2. Enrich information technology learning resources for the elderly. Publish information technology teaching materials suitable for the elderly, and build multimedia learning resources such as text, graphics, video and audio; combine learning resources with face-to-face teaching in the classroom to form a learning model for pre-class review, practice in class, and review after class; elderly education urgently needs high-quality and targeted learning resources.

3. Increase access to information education for the elderly. At present, the information technology ability of the elderly has limited the effectiveness of self-learning. We should give full play to the effects of government functions, activate public service institutions for the elderly, support semi-public institutions, and encourage business social institutions to jointly promote the improvement of the information technology capabilities of the elderly. [5]

4. The information technology teaching content of the elderly is application-oriented to meet the living and learning needs of the elderly. The content of information technology teaching for the elderly must be simple, easy to operate, and difficult to moderate. They must also keep a close eye on life and focus on practicality and practicality.

Based on the Huludao University for Elderlies and the “Post Production of Photography” course as a practical platform, this study determined that most of the students' information technology capabilities and post-production professional level have been improved through questionnaire surveys and analysis of student interview data. At the same time, it also reflects the lack of pre-class review and single resource for review. Faced with the contradiction between the elderly's low information technology ability and higher information technology education needs, future research objects should pay more attention to the elderly and low-educated elderly groups, and think about how to combine online learning and classroom face-to-face education to effectively improve the information of the elderly technical skills.

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