

## **EXPLORING THE INFLUENCE OF ELDERLY WITH E-SOCIAL NETWORK PLATFORM IN NURSING HOME**

Cheng-Yi Chiang, Department of Information Management, National Chung Cheng University, 168, University Rd., Min-Hsiung Chia-Yi, 62102, Taiwan, (R.O.C.), g98556002@mis.ccu.edu.tw, 886-5-272-0411

I-Chiu Chang, Department of Information Management, National Chung Cheng University, 168, University Rd., Min-Hsiung Chia-Yi, Taiwan, 62102, (R.O.C.), misicc@mis.ccu.edu.tw, 886-5-272-0411

Hui-Mei Hsu, Department of Business Management, National Kaohsiung Normal University, 116, Heping 1st Rd., Lingya District, Kaohsiung, 80201, Taiwan (R.O.C.), hmhsu@nknu.edu.tw, 886-7-7172930

### **ABSTRACT**

Long-term care for Taiwan's aging population will become a major issue in near future. A survey about elderly people's daily life activities displayed that "chatting with friends" was their main activity. However, a research found the depression level of geriatric who living in nursing home is higher than in general communities. Thus, we use a popular social website known as Facebook to assist geriatric to express their feelings, emotions, and even anxieties to their friends. The results showed that attachment motivation is the major influence on using the platform and e-social networking can improve elderly depression and loneliness level greatly.

**Keywords: Facebook, Elderly, e-Social Network Platform**

### **INTRODUCTION**

The medical level is constantly moving upward in Taiwan, and the fastest aging populations of Taiwan will be the top in the world (CEPD, 2011). With the development of life course, there are more and more problems lead to elderly to feel lonely and lonely(Dystra, Van Tilburg & De Jong-Gierveld, 2005; Essex & Nam, 1987). In recent years, the social patterns has changed. The elderly population will be placed in long-term care facilities, thus the social relations of elderly who live in institutions will be changed. Loneliness is a potential problem(Victor et al., 2002). The study also displayed that social activities not only promoted elderly to maintain basic functional activities, but also reduce the degree of disability. In fact, these elderly people need companionship. How to make the elderly feel that they are accompanied all the time? The current technology might help.

### **LITERATURE REVIEW**

Microblogging provides a rapid sharing platform. The ability of information sharing is much better than traditional way (Ebner & Schiefner, 2008). Templeton(2008) defined the microblogging as a mini-blog. It is able to share things in a simple way and update those messages at any time. These messages can be sent not only to specific contact, but also to the whole online people. Users can also feedback and interact with others (Wolfgang Reinhardt, 2009).

Mihaly Csikszentmihalyi proposed the flow experience concept in 1975. It was defined that a person will ignore other things when he/she was immersed in an activity, and it can bring great pleasure (Csikszentmihalyi & LeFevre, 1989). Finneran & Zhang(2005)believed that flow experience was an ideology. The individual performance will be very excellent in this status and ignore time consuming. Novak, Hoffman, & Yung(2000)developed a model to measure the relationship between flow experience and activities. In recent years, flow experience was discussed in the field of information technology. Many scholars used flow experience to explore the impact on using information technology.

The psychotherapist, John Bowlby proposed attachment motivation (Bowlby, 1958). Attachment theory describes the dynamics of long-term relationships among humans. Its most important tenet is that an infant needs to develop a relationship with at least one primary caregiver for social and emotional development. Attachment motivation is considered an innate instinct to establish a strong emotional link with the main caregivers (West & Sheldon-Keller, 1994 ; Ainsworth, Blehar, Waters, & Wall, 1978).

## METHOD

### Research Design

In this study, we use field study. In order to increase the reliability and validity, we choose two different types of nursing home as experimental institutions. One subject is a private nursing home in Chiayi City and the other nursing home is attached in a hospital in Taichung City. The scale of former institution is 99 beds; the scale of latter institution is 74 beds. The eligibility criteria for residents to enroll in this study were "good communication skills", "moderate mental dysfunction following", "no delirium phenomenon", and "no NG tube". After screening by the staffs of nursing home, there were 21 residents joined this study.

In this study, we chose Facebook which provides the most varied interactive way as a test platform. It can be used to record audio and video to convey a message. Before the residents started to use Facebook, three scales—"Geriatric Depression Scale, GDS", " elderly loneliness scale", and "mini-mental state examination, MMSE" of residents were measured. After they started to use Facebook, three scales—"Geriatric Depression Scale, GDS", " elderly loneliness scale", and "e-social networking platform impacting for residents questionnaire". The participators in this research included medical treatment and nursing, social worker personnel, nutritionist, rehabilitation therapist, pharmacist, attendants, volunteers. The process of interaction on the system during the experiment is as shown below the figure1.

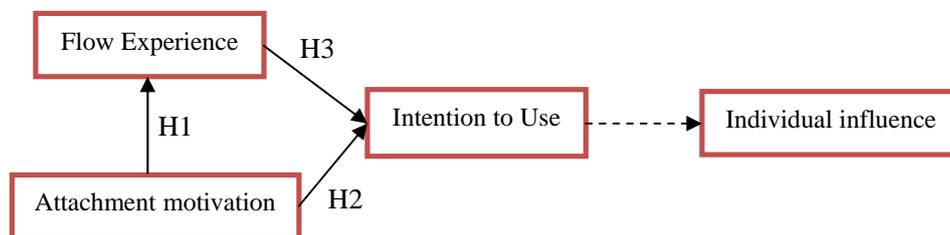


**Figure 1 Operation Flow**

## Research Model

The research model of this study was established basing on flow experience theory. The using instant messaging causes attachment motivation and thereby increases the playfulness of the intention to use instant messaging. And we understand the enjoyment of web affects their cognitive focus, and thereby affects the intention of using the site.

Finally, although there are no literatures direct supporting if it exits the significant psychological impact after residents using information technology. However, in this study we still remain highly interests in exploring the using of e-social networking platform for the residents who live in nursing home. In figure2, we can see the overall research model, and use a dotted line to express the relationship between two variables is uncertain.



**Figure 2 Research Model**

## Hypotheses

Instant messages allow users to obtain the current situation of his friend. It can provide immediate contact without considering the distance. As a result, it is a very smooth communication channel for people (Sarbaugh Thompson & Feldman, 1998). Li et al. (2005) proposed that using instant messages can cause a very high attachment motivated and increase the intention of using instant messages. Moreover, Baumeister & Leary(1995)referred that pleasant and frequent interaction with others was benefits to the physical and moral health. Therefore, this study proposed the following assumptions:

H1: Attachment motivation positively affects residents' flow experience of using e-social networking platform.

H2: Attachment motivation positively affects residents' intention of using e-social networking platform.

Flow experience is verified that it is a significant experience which can predict the effects after using information technology, such as the using attitudes and using intention (Trevino & Webster, 1992). Flow experience is one way which can catch the subjective enjoyment experience. And the experience comes from interactive between humans and information technology. The contemporary information technology often uses multimedia and graphical interface to enhance interactive between information technology and people, and strengthen attractive experiences which come from using information systems (Agarwal & Karahanna,

2000). After producing flow experience, users will have a more positive and proactive attitude when they use information technology (Csikszentmihalyi, 1990; Ghani & Deshpande, 1994). Therefore, this study proposed the following assumptions:

H3: Flow experience positively affects residents' intention of using e-social networking platform.

Interactive multimedia can stimulate the long-term memory of dementia patients, and it helps to verbal and physical interaction (Gowans et al., 2004). However, there are many kinds of individual impacts. In this study, we use "Geriatric Depression Scale, GDS" and "elderly loneliness scale" to understand if it can change the level of depression and loneliness after residents using e-social networking platform.

### **Data Collection**

The data collection involved two parts. The first part was developing a research model to understand the effects of flow experience, attachment and intention to residents when they are using this platform. The second part was use "Geriatric Depression Scale, GDS" and "elderly loneliness scale" to understanding their influences on residents.

### **Data Analysis**

Partial least squares method(PLS) would be more better than LISREL model to test the latent variable causal model(Causal Model). Because of the small sample size in this study, we use PLS which is not limited sample size and variable type. Efron & Tibshirani(1993) proposed bootstrap method( repeated sampling method). Even if the original sample is only 20 to 80 when it collected 1000 samples again and again, it still gets a good result. Therefore, Smart PLS 2.0 M3(Ringle et al., 2005) was use to analyze.

## **RESULTS**

### **Homogeneity Test**

Because of different institutions, we process homogeneity test of subjects to confirm that it is without significant differences in residents. Test variables can be divided into metric variable and non-metric variable. Metric variable uses a nonparametric test, Mann-Whitney U test was employed in this study. The results was shown that p-value of two-tailed test are bigger than 0.05, as a result, it should accept the null hypothesis when it did not reach significant levels (please see table 1). Non-metric variable uses chi-square test and the results was displayed on table 2. From the Table 2, the significant at the two-tailed exact (p-value) of each variable was bigger than 0.05, it indicated they are not reached the level of significance.

**Table 1 Homogeneity Test of Metric variables**

	MMSE	Geriatric Depression Scale	Elderly Loneliness Scale
Mann-Whitney U	32.500	47.500	28.500
Wilcoxon W	77.500	125.500	106.500
Z score	-1.532	-.471	-1.831
Asymp. Sig. (2-tailed)	.126	.638	.067
Exact Sig. [2*(1-tailed Sig.)]	.129 <sup>a</sup>	.651 <sup>a</sup>	.069 <sup>a</sup>

a. Not corrected for ties.

**Table 2. Homogeneity Test of Non-metric Variables**

Variable	Taichung (n=12)		Chiayi (n=9)		Total (n=21)		Fisher's
	n	%	n	%	n	%	
Distinction							0.670
Male	7	58.3	4	44.4	11	52.4	
Female	5	41.7	5	55.6	10	47.6	
Language							0.603
Mandarin	3	25	1	11.1	4	19	
Taiwanese	9	75	8	88.9	17	81	
Educational							0.229
In country below	9	75	9	100	18	85.7	
Above high school duty	3	25	0	0	3	14.3	
Matrimony							0.184
Not loses spouse	7	58.3	2	22.2	9	42.9	
Loses spouse	5	41.7	7	77.8	12	57.1	
Participation group activities							0.553
No	1	8.3	2	22.2	3	14.3	
Yes	11	91.7	7	77.8	18	85.7	

### Reliability and Validity

The result of confirmatory factor analysis(CFA) was shown in table3. Except item FC\_1,the loading value of other items are greater than 0.5. Thus item FC\_1 was discarded basing on Hair et.al. suggestion(2006). The reliability and discriminant validity were also displayed in table 3. According to the results of PLS, the composite reliability(CR) of each variable were higher than 0.7 suggested by the literature (Hair, Black, Babin, Anderson, & Tatham, 2006), it indicated that our measurement tool was reliable. As for discriminant validity, the AVE value of each

dimension was greater than 0.5, and the square root of AVE value was greater than the correlation coefficient with other dimensions. Therefore, the results showed that the measurement tool possessed convergent validity and discriminant validity.

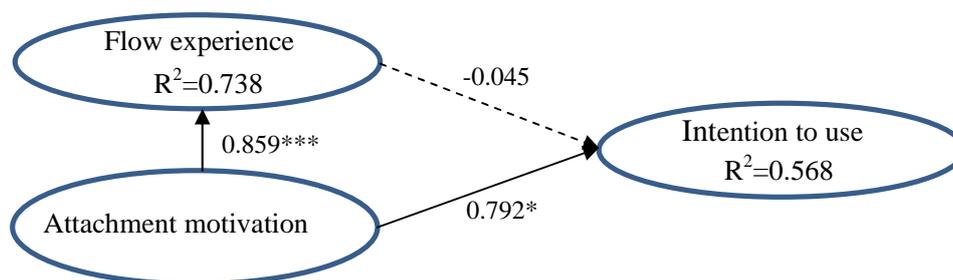
**Table 3. Item Factor Loading, Reliability, and Validity**

Dimension	Item	Factor loading	CR	AVE	Attachment motivation	Flow Experience	Intention to use
Attachment motivation	A_1	0.8853	0.9344	0.7809	0.8837		
	A_2	0.9055					
	A_3	0.8378					
	A_4	0.9044					
Flow Experience	FC_1	0.4247	0.9411	0.6443	0.8593	0.8027	
	FC_2	0.9707					
	FC_3	0.9707					
	FFA_1	0.5424					
	FFA_2	0.5399					
	FI_1	0.7107					
	FI_2	0.9435					
	FP_1	0.7218					
	FP_2	0.8883					
	FP_3	0.9107					
	F_C_1	0.7722					
	F_C_2	0.6969					
	Intention to use	BIU_1					
BIU_2		0.8551					

[Note]: gray cells indicate that the dimensions of the end of the square root of the AVE.

### Test of the Structural Model

The path coefficient of the attachment motivation to flow experience was 0.859. It reached statistical significance level and it was a significant positive impact. The path coefficient of attachment motivation to use intention was 0.729. It also reached statistical significance level and it was a significant positive impact, too. The path coefficient of the flow experience to using intention did not reach statistical significance level. The whole model could explain 56.8% variation of the intention of elderly people to use Facebook. The attachment motivation could explain 73.8% variation of flow experience. The results of structural model analysis were shown in figure 3.



**Figure 3 Research Model**

### **Influence on Depression and Loneliness**

The Wilcoxon signed rank test for GDS showed Z value was equal to -3.734 with  $p=0.000$  at a statistic significantly level. For elderly loneliness, the results showed Z value was equal to -3.597 with  $p=0.000$ . The results indicated that using the platform could cause a significant impact for residents. For most residents, the GDS and loneliness measure improved significantly after they used the platform. The statistic test results were shown in Table 4.

**Table 4 Postscor-Prescore Test Statistics for GDS and Loneliness**

	Z value	Asymp. Sig.(2-tailed)
Geriatric Depression Scale, GDS	-3.734 <sup>a</sup>	.000
Loneliness Elderly Scale	-3.597 <sup>a</sup>	.000

The study finds that processing social activities through e-social networking platform could reduce the level of depression and loneliness for residents. It confirmed the research of Glass(1999) and other scholars which proposed that the elderly people participate in social activities could help reduce psychological pressure. Our research also met the research which Gleib(2005) proposed. He said that elderly people could reduce depression and the potential pressure when they have better social networks and are actively involved in social activities. The results explained that residents can have a positive impact through using e-social networking platform.

### **LIMITATION**

There are some limitations in this study. First, Facebook has its advantages which is convenient to use and free. And for our research, the main function is recording audio and video. But its interface is still complex for residents of nursing homes. In addition, the subjects of this study are difficult to recruited. For example, residents rejected to join our research or were reluctant to participate in activities. Even during test process, the test may stop because of residents' health status. Last, the questionnaire design came from the literatures which discussed with online instant messaging. As a result, the situation may not fit nursing homes, the measurement may cause a bias.

## CONCLUSIONS

The results showed that attachment motivation which came from social interactions by computers had a significant impact on flow experience and intention to use e-social networking platform. It indicated that the more strongly attachment motivation, the higher flow experience and higher intention to use e-social networking platform. However, flow experience did not have significant impact on intention to use e-social networking platform. Many residents in this study reflected the persecution of using computer before they accessed platform, thus it might be the reason that e-social networking platform could not provoke the flow experience of residents. In addition, the results showed that the depression or loneliness scores improved significantly after residents used e-social networking platform in their daily activities. Therefore, that social interactions through e-social networking platform could help elderly to reduce their depression or loneliness level.

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