



The Relationship between Motivation, the use of Mobile Devices and Satisfaction with life for Older Farmers

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ABSTRACT

In terms of functionality, today's mobile devices allow users to surf the Internet, monitor e-mail, watch and share videos and pictures, interact on social-networks and utilize a large array of software-driven applications. Much research concerns motivation and satisfaction in the school system, but there is little empirical evidence of how these factors affect older farmers. While mobile technologies and social media have changed the value and importance of human connections, it is necessary to understand the interaction between motivation and satisfaction with life for older farmers. This study determines the relationships between motivation, the use of mobile devices and satisfaction with life for older farmers. Key factors are operationalized using scales that are widely used and tested. A survey is distributed to participants and a multiple regression is used to determine whether positive motivation for the use of the Internet and mobile devices predicts the scale for the satisfaction with life. This study contributes to related subjects by determining factors that could be optimized with a view to enhancing learning and satisfaction with life for old farmers.

Keywords: motivation, mobile technology, satisfaction with life, old farmers

INTRODUCTION

Overview

Agriculture is the backbone of most Chinese economies, especially in Taiwan, where it accounts for 1.88 percent of the nation's gross domestic product. However, Taiwan's agriculture sector is facing problems such as an aging farmer population, shortage of business managers and the gap between education and employment. As the aging problem inhibits the adoption of new technologies and the use of new knowledge, mobile learning could open the door for a new type of learning for seniors.

Lifelong learning is broadly defined as learning that is pursued throughout life at any time and in any place. In other words, an adult's learning activities play a notable role in the

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State of the literature

- As the aging problem inhibits the adoption of new technologies, mobile learning could open the door for a new type of learning for seniors.
- With a rapidly aging farming population, any attempt to improve the welfare of older farmers is vital.
- It is necessary to understand the interaction between motivation and satisfaction with life for older farmers.

Contribution of this paper to the literature

- The intention to adopt new technology is positively related to users' needs and the proliferation of mobile learning has created a wealth of learning opportunities for seniors.
- Motivation and the use of mobile devices are understandably correlated with satisfaction with life levels for older farmers.
- Older farmers who are confident in using information communication technologies to interact with others have good quality of life.

pursuit of knowledge. Horrigan (2016) pointed out that the majority of Americans feel that they are lifelong learners and that they participate in activities that include the use of technology to learn more about a personal interest. Although those with more education and higher incomes are more likely to engage in lifelong learning, technology assets are strongly tied to the possibility that adults engage in learning activities. With a rapidly aging farming population, any attempt to improve the welfare of older farmers is vital.

Adults with technology access tools, such as mobile devices, are also more likely to be lifelong learners and to use the Internet to pursue knowledge. There is a strong sense that people feel more comfortable when they continue to learn, in order to stay relevant in a changing environment. In terms of learning and technology, new means of communications could translate learning into a happier life. Therefore, with the Internet and mobile technologies providing possible access to information and the general mobility of knowledge, mobile devices allow farmers to gain instant access to useful information. There is much research about motivation and satisfaction in the school system, but there is little empirical evidence of how these factors affect older farmers. While mobile technologies and social media have changed the value and importance of human connection, it is necessary to understand the interaction between motivation and satisfaction with life for older farmers.

THEORETICAL BACKGROUND

Older Farmers

Agriculture is one of the most hazardous occupations in many regions and older farmers are often considered to be a "special needs population that needs recognition and attention" (Hernandez-Peck, 2001). Although agriculture is a major industry in the majority of countries, the share of the population that works in agriculture is declining as countries develop. In

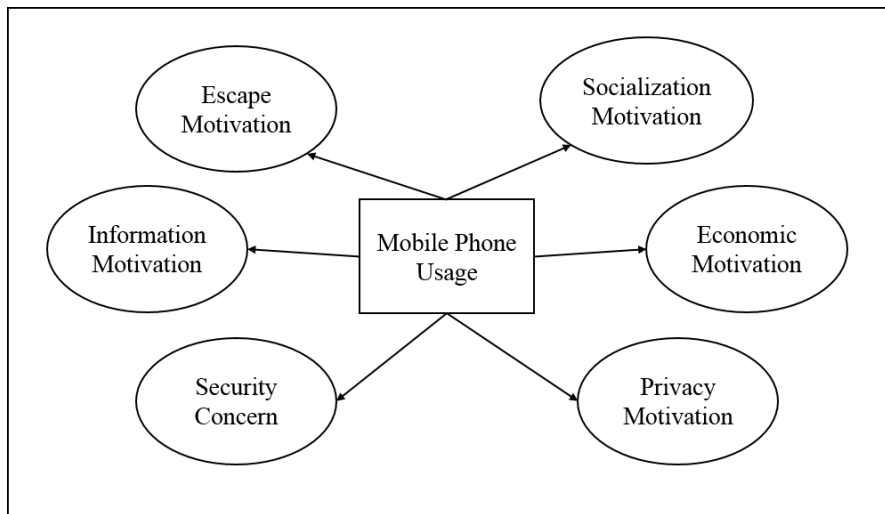


Figure 1. The Motivation Factors for the use of Mobile Phones (Chang & Villegas, 2008)

particular, the proportion of older farmers is significant and is growing. According to O'Neill (2014), 12.1 per cent of Asian farmers are over 55. An agricultural holder is defined as the person who exercises management control over the agricultural holding and makes major decisions concerning the use of resources. The average proportion of Asian agricultural holders who are over the age of 55 is 28.5 percent. Therefore, older farmers over the age of 55 are the subjects for this study.

Motivation and the use of Mobile Devices

Motivation refers to factors that engage goal-directed behavior for the needs that drive individuals and explain what people do (Pezzulo, Van Der Meer, Lansink & Pennartz, 2014; Redman, 2016). Mobile devices are any devices that are carried on the person the majority of the time, such as a smartphone, a tablet, or a hand-held device. A mobile device is also capable of communication via the Internet Hoffmann, 2015). The key factors that define mobile learning are mobility and the ability of users to access the Internet for learning purposes, without being tied to a location (Wu et al., 2012; Hoffmann, 2015).

Six aspects of learning with mobile devices that might be motivating were proposed at the IADIS International Conference on Mobile Learning in 2007: control over learners' goals, ownership, fun, communication, learning-in-context and continuity between contexts. The authors suggested that using mobiles for learning is likely to be highly motivating. (Jones & Issroff, 2007). With respect to the definition of the terminology of motivation (Chang & Villegas, 2008; Stafford, Stafford, & Schade, 2001), mobile devices have several functions that lead consumers to use them, such as (1) short text mail, (2) communication with friends, (3) taking photos and uploading them, (4) playing games, (5) listening to music and (6) mobile nets. Chang & Villegas (2008) listed six motivation factors for the use of mobile phones, as

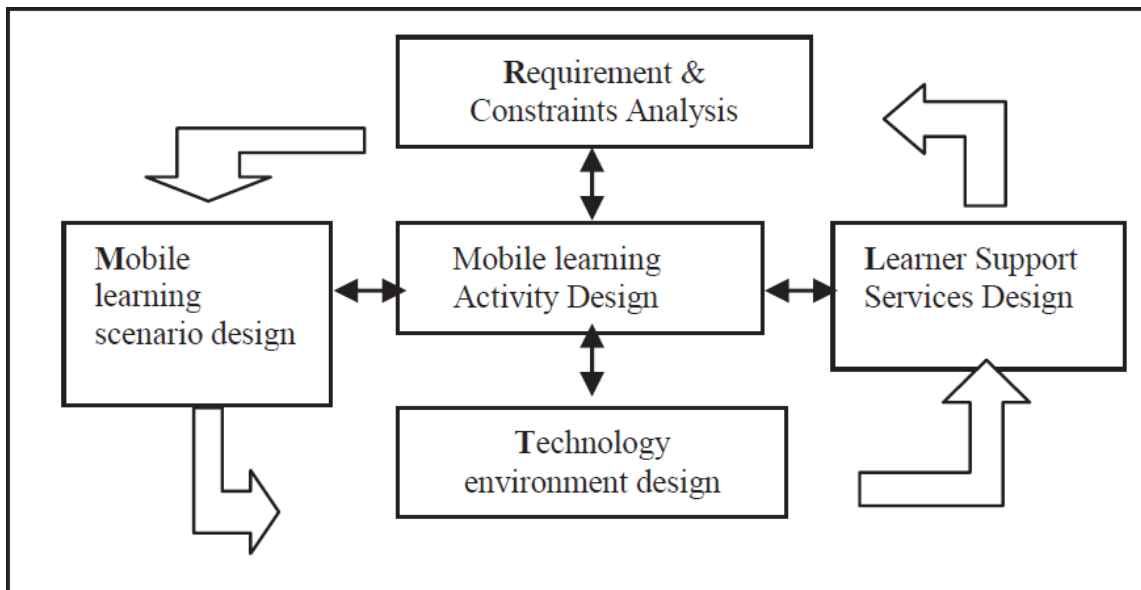


Figure 2. The Design Framework for Mobile Learning (Liu et al., 2008)

shown in [Figure 1](#). It is seen that mobile devices are a new multidimensional communication technology that are used to enrich learners' knowledge, from the user standpoint. Indeed, the fact that this technology supports learners in defining their own interests and ways of accessing further learning opportunities is crucial.

The use of Mobile Devices and Satisfaction with life

According to Saeednia & Nor (2013), Maslow's hierarchy gives the most accurate description of human motivation. Specific factors, such as safety and esteem, have been proved to have the greatest correlation with satisfaction with life. Leung & Matanda (2013) showed that self-determined motivation mediates the relationships between the use of technology and satisfaction with life.

However, the use of mobile devices could be a significant predictor of negative influence on the users (Salehan & Negahban, 2013). Mobile learning might not give sufficient importance to what it is that makes a learning activity valuable, in that it does offer a way to extend the support of interactions in everyday life and personal satisfaction with life. Sharples et al., (2007) also proposed a theory of learning for the mobile age that emphasizes lifelong learning activity. "A theory of mobile learning must take account of the ubiquitous use of personal and shared technology." (p. 224). In other words, mobile technologies and the new conceptions of learning are a personally managed lifelong activity.

Four elements must be incorporated into the design of a mobile framework (Liu et al, 2008). As shown in [Figure 2](#), these four elements are (1) an analysis of requirements and constraints, (2) mobile learning scenario, (3) the design of the technology environment and (4)

the design of learner support services. It is emphasized that an understanding of user needs and the factors that influence learning is essential to the design of mobile learning activity. This is an activity-oriented design framework that places emphasis on supporting the learners in their goal to acquire knowledge and skills that could enhance their satisfaction with life.

Many studies have explored the relationship between the use of mobile devices and measures of satisfaction with life. A relationship has been suggested whereby cell phone use increases subjective well-being or happiness. However, if the use of mobile devices is negatively related to the adoption of technology and positively related to anxiety, then it may have an indirect, negative influence on satisfaction with life (Lepp, Barkley, & Karpinski, 2014). Satisfaction with life was defined by Shin and Johnson (1978) as referring to “a judgmental process in which individuals assess the quality of their lives on the basis of their own unique set of criteria” (Pavot & Diener, 1993, p.164).

Adult Learners and Technology

Studies have indicated that the perceived usefulness of technology affects the user’s intention to adopt mobile learning that might be perceived as valuable to adult learners, such as learning opportunities (Tan et al, 2014). The technology provides a shared learning space for single learners and for groups. Most importantly, for learners who use an interactive technology with online help systems, there is a shared understanding. However, learning approaches that use mobile technology with knowledge resources have become important tools for the delivery of educational resource (Sharples, 2007; Paulins, balina, & Arhipova, 2014).

Tang et al (2012) identified several factors that impact older adults’ learning using mobile technology. Firstly, if a task list is provided for the learning process using mobile devices, older adults are very motivated (Goal setting). Secondly, older adults’ motivation to learn to use a mobile device is positively related to their perceived need to use a mobile phone (Perceived needs). Thirdly, older adults’ motivation for learning to use a mobile device is influenced by their understanding of technology (Exposure to technology). Finally, older adults who are highly motivated to learn are generally found to experience more successes and greater satisfaction with their learning outcomes (Tang et al, 2012).

METHODOLOGY

Research Design

This study determines the motivational factors that contribute to participation in mobile learning by older farmers. Previous and current research and unpublished interview data that is presented in this paper shows that there is reason to suspect that the use of mobile devices and Satisfaction with life are related. Because the capabilities of mobile devices are expanding, there is a need to study older farmers’ adoption of mobile devices. The two main research questions (RQs) are: (1) What is the relationship between motivation (Goal setting, Perceived

needs, Exposure to technology) and the use of mobile devices? and (2) What is the relationship between the use of mobile devices and Satisfaction with Life. The following hypotheses (H1 = RQ1; H1 = RQ2; see below) are proposed:

(RQ1 - H1). Mobile Device Use (MDUse) has a positive relationship with Goal Setting and a positive relationship with Perceived Need. Exposure to Technology is negatively related to the use of Mobile Devices.

(RQ2 - H1). The use of mobile devices is positively related to Satisfaction with Life.

Population and Sample

The target population for this paper is limited to the members of the Tainan City Anna District Farmer's Association. A total of 107 of the 130 surveys were returned. Two of the 107 surveys were not completed, so were not useable. A total of 105 surveys were used for the analysis.

Instrumentation

A survey was completed during class in a school of continuing education by all adults who consented to participate. The survey composed several sections: (1) demographic information, (2) the Satisfaction with Life Scale (SWLS; Diener et al., 1985), (3) questions about the use of mobile devices (Lepp et al., 2013) and (4) Positive attitude towards the Internet (Shillair et al., 2015).

Data Collection

Demographic information included questions about sex, age and educational level. Less than elementary school was 1, high school graduate is 2 and college graduate is 3. The SWLS contains five statements about general satisfaction with life (i.e., subjective well-being) using a 5-point Likert scale from "Strongly Disagree" to "Strongly Agree". Higher scores on this measure indicate greater satisfaction with life, with a score of 20 representing the neutral point on the scale (i.e., equally satisfied and dissatisfied).

Questions about the use of mobile devices stated the following: "As accurately as possible, please estimate the total amount of time you spend using your mobile phone each day. Please consider all uses, except listening to music" (Lepp et al., 2013). For instance, the total amount of time that older adults spend with mobile devices includes calling, texting, using Facebook, e-mailing, sending photos, gaming, surfing the Internet, watching videos and all other activities that use mobile devices.

Key factors were operationalized using scales that are widely use and tested. Full variables and Cronbach's alpha levels are given in **Table 1**. Satisfaction with life indicators include questions developed by Diener, Emmons, Larsen & Griffin (1985), and the perceptions of positive attitude towards the Internet from Hiltz and Johnson (1990) and modified by Shillair et al (2015) are also listed in **Table 1**.

Table 1. Questions and Variables

Variables	Questions	Source and alpha levels
Satisfaction with Life Scale	Five point scale (1=strongly disagree to 5=strongly agree) In most ways my life is close to ideal The conditions for my life are excellent So far, I have gotten the important things I want in life I am satisfied with my life as a whole If I could live my life over, I would change almost nothing	Diener, Emmons, Larsen & Griffin, 1985 Alpha = .889
Positive Attitude towards the Internet	Five point scale (1= strongly disagree to 5=strongly agree) "Please tell me how much you agree or disagree with the following statements: Using the Internet has: Made it easier for me to reach people Contributed to my ability to stay in touch with people I know Made it easier to meet new people Made it easier to get information that I need Increased the quantity of my communication with others Made me feel less isolated Helped me connect with my friends and family Increased the quality of my communication with others Is useful to me	Hiltz and Johnson, 1990 Shillair, et al., 2015 alpha= .97

Data Analysis

Descriptive statistics are used to examine the demographic data. Pearson correlations between the main variables of interest were examined prior to the path analysis and two Multivariate Analysis of Variances (MANOVAs) were conducted to determine the influence of sex and the interaction between sex and the use of mobile devices and the SWLS.

Based on the review of previous research, the hypothesis was that motivation works as a mediated moderator between the use of mobile devices and the level of satisfaction with life.

RESULTS

Sample Demographics

The sample in this study includes 105 randomly selected farm household members from the Tainan City Anna District Farmer’s Association in Taiwan. The overall response rate for this research was 82.3% (n = 107). The total useable response rate was 80.7% (n = 105).

Descriptive statistics for all the major variables are presented in Table 2. On average, participants reported spending 150.15 (SD = 112.00) minutes per day using their mobile devices. The mean GS score was just above 3.05 (SD = .42) and the mean PN score was just above 3.05 (SD = .3). The mean ET score was 2.1 (SD = .2). The hypothesized correlations

Table 2. Descriptive statistics for the major variables in the mobile devices data set (N = 105)

Variable	Mobile Devices			
	M	SD	Min	Max
MDUse	131.4	64.40	60.00	240.00
GS	3.05	.42	2.0	4.5
PN	3.05	.3	2.1	3.8
ET	2.1	.2	0.0	3.0
SWLs	14.08	3.45	5	25
Age	70.5	9.09	55	85
Education	1.86	.790	1	3

Note. MDUse = minutes per day, GS = goal setting score, PN = perceived needs score, ET = exposure to technology score. SWLs = Total Satisfaction with Life Scale score.

Table 3. Correlations between Positive Motivation, MDUse and SWLs

Measure	Positive Motivation	Satisfaction with life
Positive Motivation	-	
	.217*	-
Satisfaction with life	-.336**	-.369**

** Correlation is significant at the 0.01 level (2-tailed).

* Correlation is significant at the 0.05 level (2-tailed).

between the major variables are in the expected direction and statistically significant ($p < .05$) and the correlations between MDUse and SWL are statistically significant ($p < .05$).

Regression Analysis

Table 3 shows the relationships between positive motivation, the use of mobile devices and the satisfaction with life scale. The table shows that the correlation between positive motivation and mobile device use is a medium .217 and that there is a negative correlation between satisfaction with life and other variables.

A multiple regression was conducted to determine whether a positive motivation towards the Internet and the use of mobile devices predicts satisfaction with life scale. Using the enter method, a positive motivation towards the Internet and the use of mobile devices explain a significant amount of the satisfaction with life scale ($F(2, 102)=13.138, p < .000$), with an R^2 adjusted value of .189.

Figure 3 shows the mediation moderation regression analysis. If the use of mobile devices is viewed as an independent variable and satisfaction with life as a dependent variable, the positive motivation towards the Internet on satisfaction with life levels has an effect that changes through the satisfaction with life scale.

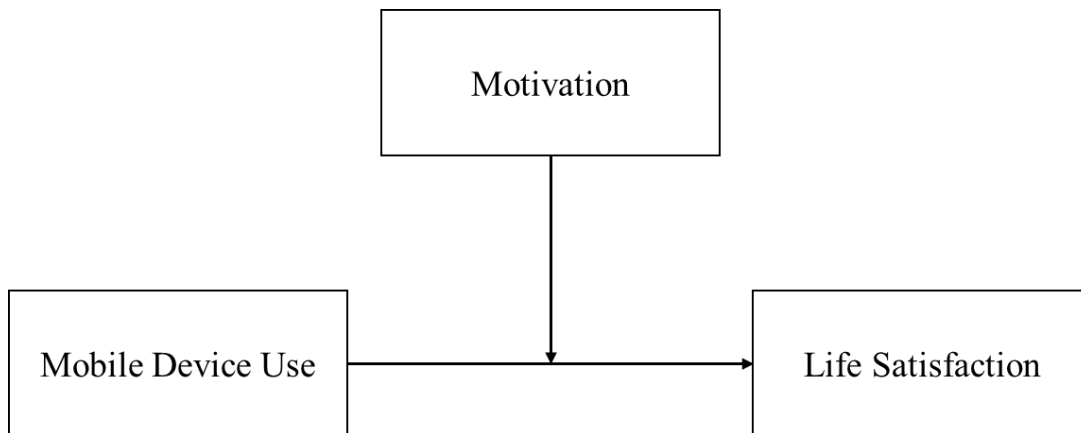


Figure 3. Mediation Moderation Analysis

Discussion

Aside from factors such as the aging of the agricultural labor force and the transfer of the agricultural labor force to nonagricultural sectors, one of the issues that Taiwanese farmers face is a lack of information and technical knowledge regarding learning approaches and improved methods of farming that can significantly affect yields. This study uses a quantitative research survey: a questionnaire was distributed to 130 older farmers in a Tainan Farmer Organization in Taiwan. Motivation factors were identified using principal components analysis. The conceptual framework was tested using correlation analysis and Multivariate Analysis of Variances (MANOVAs). Statistically significant relationships are observed between motivation and the use of mobile devices. The findings enable the implementation of strategies to enhance older farmers' learning opportunities and satisfaction with life.

Motivation and the use of mobile devices are understandably correlated with satisfaction with life levels for older farmers. Although this model explains only 19% of the variance, it does show that Internet adaptation is an important factor for older people, who would gain benefits from mobile technologies with networking. This research suggests that older farmers who are confident in using information communication technologies to interact with others have good quality of life. This supports the theory that "mobile learning must take account of the ubiquitous use of personal and shared technology" (Sharples et al., 2007). It also supports the conclusion that the intention to adopt new technology is positively related to users' needs, which implies that the nature of an innovation is the most powerful predictor for the use of technology and satisfaction with life (Li, 2014).

In terms of functionality, today's mobile devices allow users to surf the Internet, e-mail, watch and share videos and pictures, interact on social-networks and utilize a large array of software driven applications. The proliferation of mobile technology and online learning has created a wealth of learning opportunities for learners. According to Negahban & Chung

(2015), mobile devices create a social image in the society for the users. The use of mobile devices increases users' perception of the fit between functionalities of their needs, which leads to greater satisfaction with life.

Limitations and Suggestion for Future Research

It is not easy to accurately measure the levels of satisfaction with life and the positive motivation towards the Internet, especially for older adults. Most of the participants only use their own mobile devices for basic functionality, such as making calls. The main reason for not exploring beyond basic features, such as apps, is the lack of knowledge about the services that are provided via the Internet. As a result, participants are reluctant to use their mobile devices freely. They also stated that they needed to acquire a better understanding of modern technologies and the accompanying learning resources. Therefore, older farmers are motivated to achieve a successful and enjoyable learning experience, which leads to satisfaction through lifelong learning.

However, further research is necessary, using a greater number of participants, in order to further clarify the relationship between motivation and learning experience and to determine how the motivational factors can be manipulated to increase older farmers' desire to learn to use mobile devices more generally.

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