PSYCHOLOGY AND EDUCATION (2021) 58(4): 1988-1993
Article Received: 08th October, 2020; Article Revised: 15th February, 2021; Article Accepted: 20th March, 2021

The development of competency in using technology for communication of the elderly in Bangkok, Thailand

Sirilux Pornchokchai[1], Sudawan Somjai[2], Duangkamon Chantararatmanee[3]
[1,2,3]Doctor of Philosophy Program in Development Administration, Suan sunandha Rajabhat University, Thailand,
s60584917030@ssru.ac.th

ABSTRACT

The objectives of this research were to 1) study the level of correlation of factors affecting the development of competency in using technology for communication of the elderly in Bangkok area, 2) study the knowledge, understanding, attitude, and skills of using technology for communication and the technology adoption influencing the development of competency in using technology for communication of the elderly in Bangkok area, and 3) proposes the guidelines for the development of competency in using technology for communication of the elderly in Bangkok area. The research results revealed that 1) the development of competency in using technology for communication was the most important at the highest level while the attitudes, technology adoption, knowledge, understanding, and skills of using technology for communication were at the high level, 2) Factors influencing the development of competency in using technology for communication, i.e., communication technology utilization skills, adoption of technology, attitudes, knowledge, and understanding, 3) Guidelines for the development of competency in using technology for communication among the elderly in Bangkok area are to develop the quality of life of the elderly to have physical, mental, social and intellectual readiness for self-reliance. The internet is one of the most widely used medium due to the ability to provide a variety of fast services. The government's policy is to build life-long learning abilities by focusing on developing the capacity of the elderly to be able to manage knowledge, information, information content, communication, and information technology to be suitable for modern communication contexts. There must be a development in preventing harm that will occur to the elderly from using the internet. The awareness must also be raised on the risks of use for the elderly.

Keywords
Development of competency, use of technology for communication, the elderly

Article Received: 10 August 2020, Revised: 25 October 2020, Accepted: 18 November 2020

Introduction

As technology has advanced, the communication has evolved rapidly from the past where it was communicated by gestures, speaking, writing or drawing. In the era of globalization, technology has shortened distance and time. The internet enables us to communicate one another faster, even when far away. As a result, people can easily get to know and connect with one another. The advancement of the society is an information society and an aging society. Learning to use technology for communication is essential for people of all ages. At present, the elderly are less associated with international technology than other age groups. The elderly are beginning to adapt to modern technology. Although the elderly are beginning to adapt to communication technology, they are still a minority. Many older people are still not interested in communication technology due to the difficulty in using and the elderly have no or little experience. Besides, the communication technology has advanced very quickly causing the elderly to lack manual skills (Ariyasajjakorn, and Manprasert. 2014). As evidenced by statistics of the 11.6 million "elderly" or people aged 60 years and over, it was found that surfing the internet through "smart phones" was mainly noticed by using social networks and social media first. It was followed by downloading entertainment content such as watching movies, listening to music, playing games for 70.2%. 50.3% was to find product information, online shopping and health services. 45.9% was for uploading and sharing contents. 45.2% was for following news. The internet usage hours per day were 2 hours per day and there are still almost 85% of the elderly who log in to use every day (Department of Older Persons, 2019).

Consequently, for the development of competency in using technology for communication, it is very essential to understand the true needs and limitations of the elderly. Some elderly have the attitudes against the changes in communication technology. They believe that technology is a matter of young people. They have an attitude that they are too old to learn. They were not born with technology and they fear of making mistakes. They lack self-confidence and their physical conditions are deteriorating such as visual acuity, hearing, dexterity in hand movements, slow response time, illness and congenital diseases including memory which is the loss of short-term memory. These are the obstacles for the elderly. With the spread of the COVID-19 virus, there is a growing need for technology to be used in daily life. The elderly also have to adapt themselves to be consistent with technology and to prevent the dangers posed by the spread of virus as well. Development of competency in the adoption of technology for communication and learning is what stimulates the ability to think, reading and understanding what is read. Memory and slowing down symptoms of dementia will help the elderly become the persons capable of lifelong learning. Social and communication facilitates communication and can be related to family, relatives, and friends who are far away more conveniently and better. Social media is a double-edged sword. The elderly are a group that criminals aim to deceive because the elderly group is a group with a straight forward mindset and believe that no one will deceive. The elderly

people believe that they are always in a trusting society. However, in the real society, criminals are everywhere and the elderly are often unaware of these scam cheats. In using information technology, the elderly cannot know who they contact with. They do not know the information given to the elderly is true or fraudulent. It is difficult to ascertain the facts and may be fraudulent causing damage before they realize that it is a fraud (Kanda Runnapongsa, 2014). It can be seen from the news that the elderly are scammed by playing on social media such as being scammed to transfer money for help, being deceived to join the chain play or the scam about relatives looking for financial help (Dharm Cheuasathapanasiri, 2013). For the elderly who are scammed to shop online from being at home alone, this may be caused by pressing the order without reading the details or not being able to read from the poor vision problems or not being able to see clearly. They sometimes forward the news that lacked consideration of the facts first with the thought that this news would warn others to be careful or just want the others to know this news. Spreading rumors in this way may be from the good hope but if it is not true, when it was released, it can also cause chaos among people who have received the wrong information. Form the condition of the mentioned problems, the researchers are interested to study the development of competency in using technology for communication of the elderly in Bangkok area to serve as a guideline for developing and improving information and communication technology to meet the needs of the elderly.

Research objectives

1. To study the levels of the relationship of factors affecting the development of competency in using technology for communication of the elderly in Bangkok area.
2. To study the knowledge, understanding, attitude, skills and use of technology for communication and technology adoption that influence the development of competency in using technology for communication of the elderly in Bangkok area.
3. To propose the guidelines for the development of competency in using technology for communication of the elderly in Bangkok area.

Research methodology

Regarding the quantitative research, the sample group used in the research is the elderly aged 60 - 75 years old who are in the Elderly Club in Bangkok area. The sample size was calculated according to the statistical analysis technique of a multivariate type by using the structural equation modeling (SEM). It was suggested that the sample group should be approximately 20 times the observed variable (Grace JB, 2008). As the conceptual framework of the study provided 18 variables, the sample group was calculated to consist of 360 people. The data was collected using probability theory and stratified random sampling. The calculation was based on the percentage of the sample group. The research tools were the questionnaires. The researcher obtained a conformity index from 0.6-1.00 for all 85 questions. All questions could be used. The confidence value was calculated using the alpha coefficient method. It was found that the overall Reliability statistics was 0.969 which was higher than 0.70. Thus, it was considered quite highly reliable.

Regarding the qualitative research, the data was collected from the key informants who were knowledgeable, have expertise, understanding, experience in communication technology for the elderly for at least 3 years and agree to participate in the research consisting of 1) 4 executives or representatives of communication technology, 2) 3 operational staffs in communication technology, 3) 2 operators of communication technology business, 4) 2 owners of the shops selling the communication technology, 5) 2 elderly using communication technology, 6) 2 members in the family of the elderly using communication technology. The total was 15 persons. The data was acquired using a purposive selection according to the specified eligibility criteria to use in-depth interviews. The researchers used a three-wire investigation to consider the consistency and the difference of data from time, place and person sources.

From the research objectives, the researchers have studied the concepts, theories and related researches to consider constructing the structural model of the relationship among variables; 1) the development of competency in using technology for communication (DCFO), 2) cognition (COGN), 3) attitude (ATTI), 4) skills for the use of technology for communication (SUTC), and 5) technology acceptance (TEAC). The data of respondents was analyzed using the descriptive statistics to find the frequency, percentage, mean, standard deviation, coefficient of variation (CV) and inferential statistics. The analysis on the structural equation modeling (SEM) was conducted to test the relationships between latent and observable variables and the relationship between independent and dependent variables.

Research results

The levels of the relationship of factors affecting the development of competency in using technology for communication of the elderly in Bangkok area are as shown in Table 1.

Table 1 Factors affecting the development of competency in using technology for communication of the elderly in Bangkok area

Total of latent variables (TOT)	Number	Mean	St. Dev.	Level of opinion	No.
Development of competency in using technology for communication (DCFO)	360	4.23	0.79	Most	1
Cognition (COGN)	360	4.17	0.59	Much	4
Attitude (ATTI)	360	4.19	0.58	Much	2
Skills for the use of technology for communication (SUTC)	360	3.95	0.60	Much	5
Technology acceptance (TEAC)	360	4.18	0.68	Much	3
Total		**4.14**	**0.46**	**Much**	

Article Received: 08th October, 2020; Article Revised: 15th February, 2021; Article Accepted: 20th March, 2021

The analysis, comparison, and sequences of all latent variables from Table 1 can be arranged in order as follows. The development of competency in using technology for communication (DCFO) had the mean of 4.23 which was ranked the first. The second rank was Attitude (ATTI) having the mean of 4.19. The third was Technology Acceptance (TEAC) having the mean of 4.18. The fourth was Cognitive (COGN) having the mean of 4.17. The fifth was skills for the use of technology for communication (SUTC) having the mean of 3.95.

This shows the correlation and influence from the co-analysis of data to verify the consistency of the model with the empirical data after the final model was adjusted as shown in Figure 1.

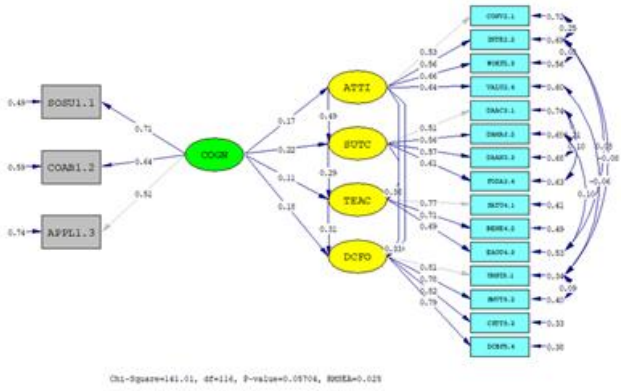

Figure 1 shows the analysis to verify the consistency of the model with the empirical data

Table 2 RESULTS OF THE COMPARISON OF THE RESEARCH HYPOTHESIS MODEL WITH THE ALTERNATIVE MODEL

GFI	Criteria	Measured index value	Results of consideration
1) Chi-Square (X^2), P-Value	p>0.05	0.057	Passed
2) Chi-Square (X^2)/df	<2.00	1.215	Passed
3) CFI	≥0.95	0.99	Passed
4) GFI	≥0.95	0.96	Passed
5) AGFI	≥0.95	0.94	Passed
6) RMSEA	<0.05	0.025	Passed
7) RMR	Nearly 0	0.026	Passed
8) SRMR	<0.05	0.040	Passed
9) CN	≥200	375.99	Passed

Table 3 RESULTS OF ANALYSIS OF THE TOTAL INFLUENCE (DIRECT - INDIRECT) SHOWING THE STATISTICAL SIGNIFICANCE

Dependent variables	Relationship	Independent variables			
		HELT	ECOM	SOCA	PSYC
ECOM	DE	0.90**	N/A	N/A	N/A
	IE	N/A	N/A	N/A	N/A
	TE	0.90**	N/A	N/A	N/A
SOCA	DE	0.37**	0.60**	N/A	N/A
	IE	0.54**	N/A	N/A	N/A
	TE	0.91**	0.60**	N/A	N/A
PSYC	DE	0.63**	0.32**	0.58**	N/A
	IE	0.24**	0.35**	N/A	N/A
	TE	0.87**	0.67**	0.58**	N/A
QLOL	DE	0.06**	0.33**	0.31*	0.29**
	IE	0.83**	0.19*	0.17*	N/A
	TE	0.89**	0.52**	0.48**	0.29**
Ranking of Total Influence (TE) 1 2 3 4					

* indicates statistical significance at level 0.05 ([t]> 1.96)
** indicates statistical significance at level 0.01 ([t]> 2.58)

The results of hypothesis testing can be summarized as follows.

Hypothesis 1: Cognition directly affects attitudes, skills for the use of technology for communication, and technology acceptance. It both directly and indirectly affects the development of competency in using technology for communication of the elderly. The results of the hypothesis testing show that cognition (COGN) has a statistically significant influence on attitudes (ATTI) and skills for the use of technology for communication (SUTC) at 0.05 levels with coefficient of 0.17 and 0.22 which is positive influence. It can be said that when cognition (COGN) increases, attitudes (ATTI) and skills for the use of technology for communication (SUTC) will increase. Meanwhile, when cognition (COGN) decreases, attitudes (ATTI) and skills for the use of technology for communication (SUTC) will also decrease.

Cognition (COGN) influences the development of competency in using technology for communication (DCFO) with statistical significance at level 0.01 and coefficient of 0.18 which is positive influence. It can be said that when cognition (COGN) increases, the development of competency in using technology for communication (DCFO) will increase. Meanwhile, when cognition (COGN) decreases, the development of competency in using technology for communication (DCFO) will also decrease.

Cognition (COGN) does not influence the technology acceptance (TEAC). Moreover, it is also found that the cognition (COGN) indirectly influences the attitudes (ATTI), technology acceptance (TEAC), and the development of competency in using technology for communication (DCFO) with the indirect coefficients of 0.08, 0.15, and 0.23, respectively. It is the positive influence.

Cognition (COGN) influences the attitudes (ATTI) with statistical significance at level 0.05 and total coefficient of 0.17. It has the influence on the skills for the use of technology for communication (SUTC), technology acceptance (TEAC), and the development of competency in using technology for communication (DCFO) with the total coefficients of 0.30 0.26, and 0.41, respectively.

Hypothesis 2: Attitudes directly affects the skills for the use of technology for communication and the technology

acceptance. It both directly and indirectly affects the development of competency in using technology for communication of the elderly. The results of the hypothesis testing show that attitudes (ATTI) influences the skills for the use of technology for communication (SUTC), technology acceptance (TEAC), and the development of competency in using technology for communication (DCFO) with statistical significance at level 0.01 and coefficients of 0.49, 0.36, and 0.29 which is positive influence. It can be said that when attitudes (ATTI) increases, the skills for the use of technology for communication (SUTC), technology acceptance (TEAC), and the development of competency in using technology for communication (DCFO) will increase. Meanwhile, when attitudes (ATTI) decreases, the skills for the use of technology for communication (SUTC), technology acceptance (TEAC), and the development of competency in using technology for communication (DCFO) will also decrease.

Moreover, it is also found that attitudes (ATTI) indirectly influences the technology acceptance (TEAC) and the development of competency in using technology for communication (DCFO) with the indirect coefficients of 0.14 and 0.32, respectively. It is the positive influence. The attitudes (ATTI) also has total influence on the skills for the use of technology for communication (SUTC), technology acceptance (TEAC), and the development of competency in using technology for communication (DCFO) with statistical significance at level 0.05 and the total coefficients of 0.49, 0.50, and 0.61, respectively.

Hypothesis 3: The skills for the use of technology for communication directly affect the technology acceptance and both directly and indirectly affect the development of competency in using technology for communication of the elderly. The results of the hypothesis testing show that skills for the use of technology for communication (SUTC) influence the technology acceptance (TEAC) and the development of competency in using technology for communication (DCFO) with statistical significance at level 0.01 and coefficients of 0.29 and 0.33 which is positive influence. It can be said that when the skills for the use of technology for communication (SUTC) increases, the technology acceptance (TEAC) and the development of competency in using technology for communication (DCFO) will increase. Meanwhile, when the skills for the use of technology for communication (SUTC) decreases, the technology acceptance (TEAC) and the development of competency in using technology for communication (DCFO) will also decrease.

Moreover, it is also found that the skills for the use of technology for communication (SUTC) indirectly influence the development of competency in using technology for communication (DCFO) with the indirect coefficient of 0.09 accordingly. It is the positive influence. The skills for the use of technology for communication (SUTC) also have total influence on the technology acceptance (TEAC) and the development of competency in using technology for communication (DCFO) with statistical significance at level 0.01 and the total coefficients of 0.29 and 0.42, respectively.

Hypothesis 4: The technology acceptance (TEAC) directly affects the development of competency in using technology for communication (DCFO). The results of the hypothesis testing show that the technology acceptance (TEAC) directly affects the development of competency in using technology for communication (DCFO) with statistical significance at level 0.01 and the path coefficient of 0.31. It is the positive influence. It can be said that when the technology acceptance (TEAC) increases, the development of competency in using technology for communication (DCFO) will increase. Meanwhile, when the technology acceptance (TEAC) decreases, the development of competency in using technology for communication (DCFO) will also decrease accordingly.

For the qualitative research, the key points of the 15 key informants can be summarized that the elderly are a group that is in high demand for love and care. Thus, the use of new media via social media plays a role and importance in helping to bridge the gap between family and the elderly making the elderly feel closer to their family and grandchildren. They can also ask for information and news of the well-being of the offspring at any time. With the use of technology, the elderly can have a lot more activities to help creating the enjoyment and the use of free time in brain development. Although technology will help the distant grandchildren be closer to an adult relative, the good encouragement and what relatives want most is love, warmth, and close care from grandchildren. However, when using technology, be careful not to allow it to distance you from the rest of your family members.

Conclusion and discussion of research results

1) The cognition affects the development of competency in using technology for communication of the elderly in Bangkok area. It can be discussed that the cognition consists of 3 components; application in use, learning ability, and support of knowledge. This is divided into 2 broad categories; Explicit knowledge which is knowledge that can be written or described in letters, function, or equation and Tacit knowledge which cannot be written or explained. This type of knowledge transfer is difficult as it is necessary to learn from practice such as the creation of knowledge that is a personal skill or ability (Shelly, Cashman, & Vermaat, 2002). This is correspondent with the KAP theory. It is a theory that is important to 3 variables; Knowledge, Attitude, and Practice. Knowledge can influence the expressive human behaviors (Upadhyay, Mohamed, Alurkar, Mishra, Palaian, 2012) corresponding with Schreurs, Haase, & Kim (2017) and Joyce, Peine, Neven & Kohlbacher (2017).

2) The attitudes affect the development of competency in using technology for communication of the elderly in Bangkok area. It can be discussed to consist of 4 elements; convenience, intention of use, efficiency in functioning, and worthiness. The attitudes towards the decision to use technology have a profound impact on today's marketing, for example, the research of Kuo, Chen & Hsu (2012). Therefore, the online shops should design the website to be easy to use, reliable, and suitable for the elderly. The elderly using the online shopping due to the perception of its usefulness, and the perceived risk tolerance. Having good experiences in using these channels results in the development of positive attitudes (Lignell, 2014).

3) The skills for the use of technology in communication affect the development of competency in using technology for communication of the elderly in Bangkok area. It can be discussed that it consists of 4 elements; access to the data,

data management, data analysis, and data forwarding. The technological skills are the Operational Computer and Network skills including information technology (ICT), ready-made computer programs related to management and human resource development (HR Software), the ability to use and participate in the media network(social media skills), the abilities in using the electronic office equipment to enhance the efficiency and operational agility. The digital skills can be applied to meet the goals and strategies of the organization covering the Ethical and Responsible use of the Digital and technology advancement to develop their own usability to keep up with the ever-changing technology. This agrees with Jaya (2017).

4) The technology adoption affects the development of competency in using technology for communication of the elderly in Bangkok area. It can be discussed to consist of 3 elements; ease of use, benefits of functionality, and safety. This is consistent with Tao (2009), Haque (2014), Cheong and Park (2015), Van Riel and Lievens (2014), Mort and Drennan (2015) and Hsu, Wang and Wen (2006).

References

[1] Ministry of Information and Communication Technology. (2011). Information and Communication Technology Policy Framework of Thailand B.E.2554-2563. Bangkok: Ministry of Information and Communication Technology.

[2] Nutthanan Siricharoen. (2015). A case study of the use of new media via social media in mobile phones to promote quality of life for seniors and family members in New Zealand. Veridian E-Journal, Silpakorn University in Thai version, Humanities: Social Sciences: and Arts, 8 (3) (September - December), 96-116.

[3] Pimjai Tayati, Chamaiphorn Disathaphorn, and Ritthichai Onming. (2017). Model of learning management for the elderly in Thailand to learn about information technology and communication. Veridian E-Journal, Silpakorn University, 10 (3), 1613-1629.

[4] Academic Office, Secretariat of the House of Representatives (2016). Thailand 4.0. Accessed from http://www.parliament.go.th/library.

[5] Al–Jabri, I., &Sohail, M. S. (2012). Mobile Banking Adoption: Application of Diffusion of Innovation Theory. Journal of Electronic Commerce Research, 13(4), 379– 391.

[6] Benora, S.K., Khelendra, R.K., Choudhury, B.N., et al. (1992), AIDS. Survey of knowledge, attitude and beliefs of undergraduate students of Delhi University, Indian Community Med, 17:155-159.

[7] Bercuson, Kenneth. (2006). Singapore: A Case study in Rapid Development. Retrieved from: http://www.imf.org/en/Publications/Occasional-Papers/lssues/2016/12/30/Singapore-A-Case-Study-in-Rapid-Development-450.

[8] Cotten, S. R., Yost, E., Berkowsky, R. W., Winstead, V., & Anderson, W. (2016). Designing technology training for older adults in continuing care retirement communities. Boca Raton, FL: CRC Press.

[9] Cronbach, L. J. (1963). Educational psychology. New York: Harcourt Brace and World.

[10] Dubois D. David, Rothwell J. William. (2004). Competency - Based Human Resource Management. Davies - Black Publishing, California.

[11] Hanna, N., & Wozniak, R. (2001). Consumer behavior an applied approach. New Jersey: Prentice

[12] Hall. Haque, A. (2004). Mobile commerce: Customer perception and it's prospect on business operation in Malaysia. Journal of Financial Services Marketing, 8(3), 206–217.

[13] Kim,K., Gollamudia, S. S., & Steinhubla, S. (2017). Digital technology to enable aging in place. Experimental Gerontology, 88, 25-31

[14] Laforet, S., & Li, X. (2005). Consumer's attitudes towards online and mobile banking in Chian. The international Journal of Bank Marketing, 23(4/5), 362–380.

[15] Lu, J., Yu, C., Liu, C., & Yao, J. E. (2003). Technology acceptance model for

wireless Internet. Internet Research, 13(3), 206–222.

[16] Marshall, B. L., & Katz, S. (2016). How old am I? Digital culture and quantified ageing. Digital Culture & Society, 2, 145–152. doi:10.14361/dcs-2016-0110

[17] Melancon J, Oomen-Early J, del Rincon LM. (2009). Using the PEN-3 model to assess knowledge, attitudes, and beliefs about diabetes type 2 among Mexican American and Mexican Native men and women in North Texas. Int Electron J of Health Educ, 12, 203–221.

[18] Pérez-López, S., & Alegre, J. (2012). Information technology competency, knowledge processes and firm performance. Industrial Management & Data Systems, 112(4), 644-662

[19] Schreurs, K., Haase, A. Q. & Kim, M. (2017). Problematizing the Digital Literacy Paradox in the Context of Older Adults' ICT Use: Aging, Media Discourse, and Self-Determination. Canadian Journal of Communication, 42, 2, 359–377

[20] Upadhyay DK, Mohamed IM, Alurkar VM, Mishra P, Palaian S. (2012). Evaluation of knowledge, attitude, and practice of newly diagnosed diabetes patients - a baseline study from Nepal. Int J Pharm Teach Pract, 3(2), 245-252.

[21] Van Riel, A. C. R., &Lievens, A. (2004). New service development in high tech sectors: A decision making perspective. International Journal of Service Industry Management, 15(1), 72–101.

[22] Vasconcelos C, Pinheiro A, Casteol A, Costa L, Oliveira R. (2011). Knowledge, attitude and practice related to the pap smear test among users of a primary health unit. Rev. Latino-Am, 19(1), 97-105.

[23] Williams, E. (2009). Information needs and seeking behavior of nurses at the University College Hosptital Ibadan, Nigeria. [Electronic version]. Afr.J.Lib,Arch&Inf.Sc. 19, 1: p.25-38.

[24] Wilson, T.D. (1999). On user studies and information needs. Journal of Document. 37(1), p.3-15.

[25] Wilson, T.D. (2005). Evolution in information behavior modeling: Wilson's model". In K.E. Fisher, S. Erdelez & L. McKechine (Eds.), Theories of information behavior.(p.32-33). Medford, N.J: Information today, Inc.

[26] Wilson, T. D. (2000). Human information behaviour. Informing Science, 3(2), 49-55.

[27] Zain, Muhammad; & Idrus Rozhan. (2006). The Impact of Information and Communication Technology (ICT) on the Management Practices of Malaysian Smart Schools. Retrieved July 12, 2016, from https://eric.ed.gov/?id=EJ731454.