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Factors Influencing Knowledge Sharing among Thai ICT Undergraduate Students

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Abstract

Knowledge sharing can enhance learning and assist in building the knowledge workforce especially in the field of Information and Communication Technology (ICT). This paper reports a quantitative survey study of knowledge sharing behavior among Thai ICT undergraduate students. The subjects were 296 undergraduate students from a private university voluntarily participated in the study. The instrument was a survey of 21 items in 6 factors identified through the research objectives, the literature review, and the item generation approach. The data collection period was two months from January to February 2017. Descriptive and inferential statistics and correlation coefficients were used to analyze the obtained data. The major findings point to *knowledge sharing among ICT undergraduate students* influenced by four factors: “intention to share,” “technological,” “individual,” and “classroom.” The researchers noted that two factors: “perceived usefulness” and “organization” exerted no influence on “*knowledge sharing among these ICT students.*”

Keywords: *Knowledge sharing, ICT, item generation, multiple regression, path analysis*

1. Introduction

Knowledge sharing plays a significant role in an economic development of a country and adds values to commercial organizations (Reige, 2005). Thus, a private university could also gain benefits from these added values (Chikoore & Ragdell, 2013). Knowledge sharing is an essential component of effective learning at the tertiary level (Chikoore & Ragdell, 2013; Keong & Subhi, 2015; Majid & Yuen, 2006; Nuansomsri & Jantavongso, 2016; Yaghi et al., 2011). Despite this assertion, there has been only a limit number of studies in an educational context, especially in Thailand (Wangpipatwong, 2009). Accordingly, knowledge sharing constitutes an importance element for intellectual discourses in that it demands tasks requiring time and effort from students (Ghadirian et al., 2014). Yaghi et al. (2011) emphasized that an education level can affect knowledge sharing attitude of a person. Chikoore & Ragdell (2013) elaborated this standpoint in that students could learn to formulate ideas and opinions more effectively by communicating them to others, and that understanding of what motivates students to share knowledge is a critical task.

Thailand has focused upon expanding access to education since 1990s. As known, a more knowledgeable and skilled workforce with new capabilities and attitudes would be needed for Thailand to cope with globalization. The Thai Government has reformed the teaching and learning methods, school management systems, and the legal framework of education since 1999 (Hallinger & Lee, 2011). One of the reform principles is

'continuous of learning process' supported by knowledge sharing (Udomrat, 2012). Thai private higher education institutions allow alternatives for students to gain their tertiary qualifications. As stated in the Sixth National Higher Education Development Plan 1989-1991, private institutions are given financial support to further improve their standards of education and provide new education programs. As such, 65 private institutions--41 universities, 19 colleges and 5 intuitions--are to strengthen educational development of the country (Praditteera, 2015).

Information and Communication Technology (ICT) is a driving factor promoting economic growth as well as in education. The use of ICT in education has been a key priority in many countries including Thailand (Aristovni8k, 2012; Jantavongso, 2013). ICT has caused profound methodological changes in education by means of computational approaches to complement theory and experiment. These approaches provide students with an opportunity to gain knowledge and more opportunities for their future careers, as seen in new ICT courses in university curricula in Thailand (Jantavongso, 2013). It should be noted that the Thai Ministry of Education (MOE) has implemented ICT in teaching and learning to instill ICT skills in all students. It is vital to maximize their capabilities. The Government can foresee that the quality workforce be dependent students' ICT skills in building and sharing knowledge among peers (Waitayangkoon, 2007).

2. Research Objectives

The objective of this study was to examine factors associating with knowledge sharing among Thai undergraduate students in an ICT classroom context at one private university in Thailand.

3. Literature Review

This part will cover (1) Knowledge Sharing and (2) Conceptual Model and Item Generation for readers' understanding of the study.

3.1 Knowledge Sharing

Knowledge is viewed as information that has value and is part of a hierarchy of data, information, knowledge, and wisdom; knowledge is interpreted information by one's experiences and insights within a context and contains an 'element of reciprocity' (Majid & Yuen, 2006; Nuansomsri & Jantavongso, 2016; Ghadirian et al., 2014; Al-Naheyman, 2013). Knowledge sharing is an essential element for intellectual discourses. It is also a component of knowledge management and a critical step in knowledge acquisition. Knowledge sharing has an ability to improve a learning process of students (Ghadirian et al., 2014). It should be by students' willingness to engage themselves in the process. Students are expected to be proactively responsible for their education by learning with both individual responsibility and communal sharing. Moreover, the main obstacle in learning is to encourage knowledge sharing through social interaction in various forms. Hence, knowledge sharing is a social phenomenon related to interpersonal relationships and social interactions. While communities may provide setting for participation and presence in the discussion; students share knowledge and negotiate by what they mean (Ghadirian et al., 2014). Knowledge sharing is the process where individuals mutually exchange their knowledge as well as create jointly new knowledge (Wangpipatwong, 2009; Ghadirian et al., 2014). Therefore, enhancing knowledge sharing would provide a positive effect on student's performance. However, it should be noted that students tend not to exchange knowledge among themselves.

Very few studies have addressed knowledge sharing in a classroom context among university students (Wangpipatwong, 2009). At the first glance, the meaning of classroom context may appear self-explanatory (Nuansomsri & Jantavongso, 2016). Turner and Meyer (2000) coined the term classroom context covering the beliefs, goals, values, perceptions, behaviors, classroom management, social relations, physical space, and social-emotional and evaluative climates that contribute to the students' understanding of the classroom. Added to this definition, the authors of this paper believe that knowledge sharing at the higher education level also involves the influences of (1) the teacher, (2) other students, (3) content area, and (4) instructional activities on learning, teaching, and motivation.

3.2 Conceptual Model and Item Generation

The first stage to conceptualize a model to understand knowledge sharing factors in the context of this research, involves the formulation of a study objective and a review of the literature on relevant research domains. This approach also embraces an item generation approach as adopted by the preceding researchers from 1980-2016: Schwab (1980), Hinkin (1995), Rahman (2002), Jantavongso (2007), and Nuansomsri & Jantavongso (2016).

These researchers employed a thorough review of literature to develop a theoretical definition of factor under examination. It focused on the domain of knowledge sharing which attempted to synthesize factors for the proposed model from the existing frameworks and models. In this paper, the researchers of this study attempted to limit the scope for Thai ICT undergraduate students. The purpose was to identify the domains for developing the conceptual model from a broader perspective before narrowing it into the context of Thai students in a private university. The researchers identified 21 items associated with knowledge sharing and categorized them into 6 factors: (1) Classroom (Cn), (2) Individual (In), (3) Intention to Share Knowledge (ISn), (4) Organization (On), (5) Perceived Usefulness (Pn), and (6) Technological (Tn), as presented in Table 1.

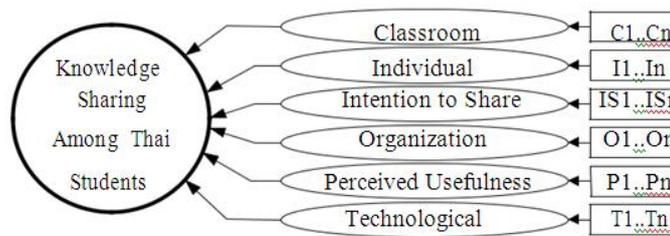
Table 1: Mapping of Knowledge Sharing Factors

Authors	(Cn)	(In)	(ISn)	(On)	(Pn)	(Tn)
[15]		×				
[21]		×	×	×	×	
[22]	×	×	×			×
[23]		×		×		
[24]		×				
[25]		×		×		×
[26]		×	×			
[4]		×		×		×
[27]				×		×
[28]		×				×
[7]	×	×				×
[29]	×	×				
[30]			×		×	

In this study, **Classroom (C)** comprises of (C1) Classmate, (C3) Degree of Competition, and (C1) Final Grade items (Wangpipatwong, 2009; Chen & Chen, 2009; Yogeesha & Gopalakrishna, 2013). **Individual (I)** comprises (I1) Ability, (I2) Communication Skill, and (I3) Willingness items (Majid & Yuen, 2006; Jer & Shaheen,

2007; Wangpipatwong, 2009; Chen & Chen, 2009; Bousari & Hassanzadeh, 2012; Al-Naheyman, 2013; Yogeeshha & Gopalakrishna, 2013; Khosravi, Ahmad & Sedera, 2014; Usman & Oyefolahan, 2014; Lu & Kim, 2016; Baig & Waheed, 2016). **Intention to Share Knowledge (IS)** refers to (IS1) Acquire Knowledge, (IS2) Discuss New Ideas, and (IS3) Share Course Materials items (Chen & Chen, 2009; Bousari & Hassanzadeh, 2012; Zamiri & Baqutayan, 2012; Lu & Kim, 2016). **Organizational (O)** factors comprises (O1) Instructor and Supervision, (O2) Knowledge Culture, and (O3) Workgroup items (Bousari & Hassanzadeh, 2012; Chin et al., 2012; Khosravi, Ahmad & Sedera, 2014; Usman & Oyefolahan, 2014; Osman et al., 2015). **Perceived Usefulness (P)** refers to (P1) Idea and Knowledge Generation, (P2) Self-Improvement, and (P3) Self Satisfaction items (Bousari & Hassanzadeh, 2012; Zamiri & Baquayan, 2012). **Technological (T)** refers to (T1) Communication Channel and Technology Support, (T2) Contact, (T3) Convenience, (T4) the Internet, (T5) Relevant, and (T6) Tool items (Wangpipatwong, 2009; Chen & Chen, 2009; Yogeeshha & Gopalakrishna, 2013; Khosravi, Ahmad & Sedera, 2014; Usman & Oyefolahan, 2014; Osman et al., 2015). These six factors identified through this process provide the insight for this study as shown Figure 1.

Figure 1: Knowledge Sharing Factors for Thai Students (A Conceptual Model)



4. Research Methodology

Following approaches to research and scholarship by Shanks, Arnott & Rouse (1993), this study is a quantitative research applying a survey approach. The questionnaire technique is selected to allow the participants to response specifically and ensure anonymity in their convenience time and location. Moreover, the survey approach is most frequently used as a empirical research method in Information Technology (IT) (Shanks, Arnott & Rouse, 1993).

The subjects were 296 of 777 students from the College of Information and Communication Technology, a private university in Thailand. The researchers used a simple random sampling method based on Krejcie & Morgan (1970) [34] and Yamane (1967). The participants were notified in person during their classes and social network. The data collection period was eight weeks, from January to February 2017.

The instrument contained two main parts to gather responses from the participants. The first part dealt with demographic information, and the second part was on the Likert-type questions. The subjects were to choose statements on a continuum, from ‘strongly not agreeing’ to ‘strongly agreeing’. The numerical codes were: 1 = strongly disagreed, 2 = disagreed, 3 = neutral, 4 = agreed and 5 = strongly agreed. The instrument was evaluated with the Index of Item Objective Congruence (IOC) by three ICT experts. Each expert was to evaluate each item by rating 1 (for clearly measuring), -1 (not clearly measuring), or 0 unclearly measuring). The items rated below 0.5 were excluded (Turner et al., 2002).

Three statistical data analysis methods were employed: descriptive statistics, inferential statistics, and correlation statistics. The descriptive statistical techniques were

used to describe the participants in terms of frequencies, means, and standard deviations. The inferential statistical techniques deal with F statistic, to assess the overall statistical significance of the model. The correlation statistical technique was a multiple regression analysis. The multiple regression analysis was to investigate the strength of associations between factors and to identify the relationship between the dependent variable (Knowledge Sharing or KS) and the independent variables (factors). Added to this, ‘Path Analysis’ was also performed to examine relationships between key factors identified by the multiple regression analysis.

5. Research Findings

5.1 Characteristics of the Participants

As previously stated in Section 4, 296 students participated in this survey, which exceeds the value recommend by Krejcie & Morgan (1970) (250) and Yamane, 1976) (285). These students were from Years 1 to 4 enrolled in the ICT Program at the private university under study. Table 2 reports the participants’ demographic data.

Table 2: Characteristics of the Participants

		Frequency	Percentage
Gender	Male	154	52.03
	Female	142	47.97
Year Level	Freshman	69	23.31
	Sophomore	73	24.66
	Junior	76	25.68
	Senior	78	26.35
GPA	< 2.00	35	11.82
	2.01 – 2.50	124	41.89
	2.51 – 3.00	84	28.38
	> 3.00	53	17.91
Total		296	100.00

Cronbach’s Alpha or coefficient alpha was used in this study to measure internal consistency. According to George and Mallery (2003), there is no set interpretation as to what is an acceptable value; however, a general rule of thumb should be greater than 0.7. Table 3 presents the results of analysis of internal consistency for 296 data. The analysis provided values that met the recommended acceptable value with the exception of Technological. Despite this, the value of Organization was almost 0.7 (0.682) which is considered an acceptable value (Wangpipatwong, 2009).

Table 3: Analysis of Internal Consistency

Knowledge Sharing Factors	Number of Items	Chronbach’s alpha
Classroom	3	0.746
Individual	3	0.816
Intention to Share	3	0.776
Organization	3	0.682
Perceived Usefulness	3	0.961
Technological	6	0.747

The average from all the factors was calculated and the results from Pearson Correlation (p) Test are presented in Table 4:

Table 4: Analysis of Correlations

		KS	C	I	IS	O	P	T
KS	p	1	.587**	.130	.262	.160	.193	.100
	Sig.		.000	.413	.094	.312	.220	.530
	N	296	296	296	296	296	296	296
C	p	.587**	1	.444**	.380*	.028	.347*	.140
	Sig.	.000		.003	.013	.862	.024	.376
	N	296	296	296	296	296	296	296
I	p	.130	.444**	1	.498**	.202	.382*	.421**
	Sig.	.413	.003		.001	.200	.013	.006
	N	296	296	296	296	296	296	296
IS	p	.262	.380*	.498**	1	.023	.551**	.179
	Sig.	.094	.013	.001		.883	.000	.258
	N	296	296	296	296	296	296	296
O	p	.160	.028	.202	.023	1	-.001	.207
	Sig.	.312	.862	.200	.883		.993	.188
	N	296	296	296	296	296	296	296
P	p	.193	.347*	.382*	.551*	-.001	1	.263
	Sig.	.220	.024	.013	.000	.993		.092
	N	296	296	296	296	296	296	296
T	p	.100	.140	.421**	.179	.207	.263	1
	Sig.	.530	.376	.006	.258	.188	.092	
	N	296	296	296	296	296	296	296

**Correlation is significant at 0.01 level (2-tailed). *Correlation is significant at 0.05 level (2-tailed).

Table 5: Results of Multiple Regression Analysis

Model 1	Unstandardized Coefficients		Standardized Coefficients	
	B	Std. Error	Beta	Sig.
(Constant)	-.406	.593		.498
Classroom	.166	.079	.237	.043
Individual	.265	.125	.258	.041
Intention to Share	.335	.140	.321	.023
Organization	.010	.067	.015	.883
Perceived Usefulness	.015	.103	.016	.886
Technological	.321	.119	.291	.010

Note. R² = 0.712

The model explained 71.2% of the total variance in the rate of Knowledge Sharing by using six factors. Based on the recommendation by Pallant (2005), this model can be considered an appropriate multiple regression model. The model can obtain statistical significance. The ANOVA table (Table 6) indicated that the model was significant [F (1, 295) = 14.446, Sig. = .000].

Table 6: Results of Analysis of Variance (ANOVA)

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	15.010	6	2.502	14.446	.000
	Residual	6.061	289	.173		
Technological		21.071	295			

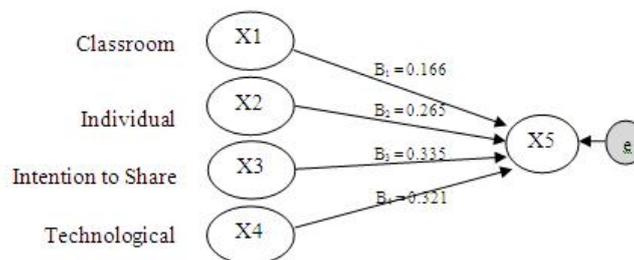
Pallant (2005) recommends the use of the beta values (beta) under Standardized Coefficients to compare the contribution of each factor (independent variable) as shown in Table 5. The largest beta coefficient (ignoring any negative signs) indicates that the factor makes the strongest unique contribution to explaining the dependent variable, while keeping other factors unchanged. The next task is to test the unique contributions of each factor to the prediction of the dependent variable (the Sig. value is less than .05).

Examining the beta values in Table 5, the researchers found four factors statistically significant. In order of importance, they are (1) ‘Intention to Share’, (2) ‘Technological’, (3) ‘Individual’, and (4) ‘Classroom’. The relationships between ‘Organization’, ‘Perceived Usefulness’ and Knowledge Sharing were not statistically significant.

5.2 Path Analysis

A path model was constructed to examine the relationship between Knowledge Sharing and the four factors. Figure 2 illustrates a path of a multiple regression analysis to predict Knowledge Sharing in association with the four factors.

Figure 2: Path Model for Knowledge Sharing



5.3 Regression Equation

The multiple regression analysis using SPSS generated the B values and the constant as presented in Table 5. From these figures, an equation can be generated to determine the predicted value for Knowledge Sharing as follows: Knowledge Sharing = - 0.406 + 0.166(Classroom) + 0.265(Individual) + 0.335(Intention to Share) + 0.321 (Technological) (1)

The results indicate the unstandardized partial regression coefficient or slope that describes the linear relationship between Knowledge Sharing and one of the four factors

with all other factors held constant, as follows: each additional degree of *Classroom*, *Individual*, *Intention to Share*, and *Technological* increases Knowledge Sharing by 0.166, 0.265, 0.335, and 0.321 degree, respectively.

6. Conclusion

Knowledge Sharing plays an important role in the educational context of Thai university students, as shown in this study. Knowledge Sharing provides Thai university students with their potential to enhance their learning. The researchers identified 21 items in 6 factors through the research objective, the literature review on relevant research domains, and the item generation approach. The students participated in the study during January to February 2017. The findings revealed that '*Intention to Share*' was the most important factor to the subjects in the study, followed by '*Technological*', '*Individual*', and '*Classroom*'. The relationships between '*Organization*', '*Perceived Usefulness*' and '*Knowledge Sharing*' in this study were not statistically significant. The overall results pointed to the importance of '*Intention to Share*' that should deserve attention from course instructors and students in the teaching-learning context.

7. The Authors

Assistant Professor Dr Suttisak Jantavongso and Assistant Professor Chuleekorn Nuansomsri are full-time staff members of the College of Digital Innovation and Information Technology, Rangsit University. Both share research interest in the areas of ITC literacy, digital citizenship and innovations in information technology.

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