

Success Factors in Sustainability of Academic Social Network Site in Developing Countries: The Case of Thailand

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Abstract

As education is the key to success in the development of any country, electronic communication technology, such as social network sites, is gaining interest and is regarded as a potential tool to provide support and even act as a tool to improve the current studying and learning environments, thereby increasing the performance of students. However, the level of success in implementation of the technologies in educational environment is limited in Thailand and the assistance of technology in teaching and learning are not widely accepted. This research revealed the success factors necessary in order to successfully implement and customize social networks for academic purposes based on the concept of data mining, using the framework which has been primarily developed based on the Unified Theory of Acceptance and Use of Technology (UTAUT).

Keywords: *Academic Social Network, Data Mining, Technology Acceptance, The Unified Theory of Acceptance and Use of Technology (UTAUT) Model*

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ปัจจัยที่ก่อให้เกิดความสำเร็จในการใช้งานเทคโนโลยีเครือข่ายสังคม เพื่อการศึกษาในประเทศกำลังพัฒนา (กรณีศึกษา: ประเทศไทย)

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บทคัดย่อ

เนื่องจากการศึกษาเป็นปัจจัยที่สำคัญอย่างยิ่งต่อความสำเร็จของประเทศ เทคโนโลยีที่เกี่ยวข้องกับการติดต่อสื่อสารมากมาย อาทิ เทคโนโลยีเครือข่ายสังคม (Social Network Website) ได้กลายเป็นที่สนใจของนักวิจัยทั่วโลกในการนำมาปรับปรุงรูปแบบการเรียนการสอนในปัจจุบันรวมถึงการเพิ่มศักยภาพให้แก่นักศึกษา อย่างไรก็ตาม การนำเทคโนโลยีมาประยุกต์ใช้ร่วมกับการศึกษาในประเทศไทยนั้นยังมีข้อจำกัดบางประการทำให้ผลลัพธ์ที่ได้นั้นไม่ประสบความสำเร็จและไม่ได้รับการยอมรับจากผู้ใช้เท่าที่ควร งานวิจัยฉบับนี้จึงมีวัตถุประสงค์ที่จะนำทฤษฎีของการทำเหมืองข้อมูล (Data Mining) และกรอบความคิดที่พัฒนาจากแนวคิดของ *Unified Theory of Acceptance and Use of Technology (UTAUT)* มาประยุกต์ใช้ในการศึกษาปัจจัยสำคัญที่ก่อให้เกิดการยอมรับและกำหนดกลยุทธ์ที่เหมาะสมเพื่อเป็นแนวทางสำหรับมหาวิทยาลัยในการสร้างเทคโนโลยีเครือข่ายสังคมเพื่อวัตถุประสงค์ในด้านการศึกษาต่อไป

คำสำคัญ: เทคโนโลยีเครือข่ายสังคมเพื่อการศึกษา เหมืองข้อมูล การยอมรับเทคโนโลยี
The Unified Theory of Acceptance and Use of Technology (UTAUT) Model

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Introduction

As education can significantly influence the development and growth of a country, the amount of research related to education is rapidly increasing and the field of research is expanding into a variety of aspects; among which, electronic communication technology is expected to be a potential tool that will provide support and even act as an instrument to improve the current studying and learning environment, thereby increasing the academic performance of students. Among several types of electronic communication technologies, the social network site (SNS) is one of the emerging technologies that has clearly transformed the way people communicate and interact. This technology provides an infrastructure of a virtual community where people can connect to each other over the Internet. As the sites have evolved, the popular social network sites such as Facebook, LinkedIn, Twitter, and YouTube have further introduced new and novel interaction instruments, including publication activities and voting systems, which support the expressions of ideas, attitudes, and perceptions of the members in the same social group and thus bring the online community closer to the real community. The acceptance and success of the technology can be seen from the significant number of users around the world.

As academics have found a role for social networks in education, technology and its corresponding implementation have become one of the most interesting topics for researchers. This is mainly because of the expected benefits that may arise from the exchange of educational information and other relevant information within the network (Greenhow & Robelia, 2009; Greenhow & Robelia, 2011).

However, while certain benefits can be expected, there are also potential pitfalls that may raise concerns with regard to the adoption and implementation of technology as per the following:

- Social networks lead to the issue of distraction and procrastination. In the classroom, students often use a social network for social uses, including reading friends' updates, sharing photos, and playing games. Scholars have indicated that most of the students do not usually connect to social

network sites for academic purposes (Grosbeck et al., 2011; Rockler-Gladen, 2010).

- Social networks can be used to distribute bad rumors among students (Rockler-Gladen, 2010).
- Most students do not accept older persons, including parents or teachers, as friends in the social network platform (West et al., 2009).

According to the aforementioned potential problems, there has also been concern related to the appropriate method of implementation of social network technology. The said issue is primarily due to the nature of the present social network sites, which are intended to be used for general purposes and for the relationships of each individual rather than a specific purpose, such as education. While prior studies have attempted to apply existing social network sites, including Twitter, Facebook, YouTube and many others, as a supplement to the contents provided via the traditional learning environment, the management and control of contexts have become extremely complex. Alternatively, a large number of universities throughout the world have shown interest in and demand building their own social network sites.

Therefore, it is necessary to ascertain the benefits that can be expected from the use of social network sites in the academic environment and to examine the potential pitfalls of the same. This will lead to a suggestion on the appropriate implementation and customization method that is significant to the success, and may ensure sustainability of, social network site in the long term.

According to the interest and demand of academic institutes in building their own social network sites, this research attempts to explore and identify the factors that may influence the acceptance of using social network site in an academic environment. It is also an objective of the study to explore the benefits and potential pitfalls of such use in order to provide a guideline in the implementation and customization of technology in conformity with the demand and requirements of students, instructors, and others involved.

Unified Theory of Acceptance and Use of Technology (UTAUT)

The Unified Theory of Acceptance and Use of Technology (UTAUT) model developed by Venkatesh et al. (2003) has become one of the most famous models used by researchers to explain the use of technology. This model integrates important factors across eight models related to the explanation of technology usage behavior. The reviewed eight competing models include the theory of reasoned action (TRA), the technology acceptance model (TAM), the motivational model (MM), the theory of planned behavior (TPB), a model combining the technology acceptance model and the theory of planned behavior (TPB), the model of PC utilization (MPCU), the innovation diffusion theory (IDT), and the social cognitive theory (SCT).

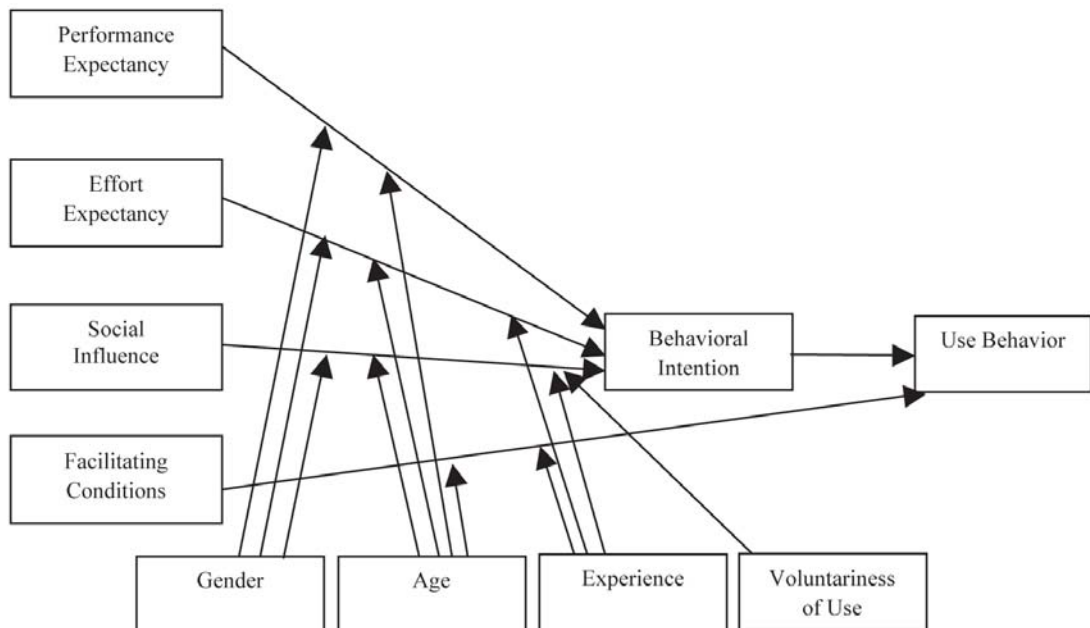


Figure 1: Unified Theory of Acceptance and Use of Technology (UTAUT) Model
(Venkatesh et al., 2003)

As can be seen in Figure 1, the UTAUT model was formed with four major factors of intention and use of technology, and up to four moderators of key relationships, including gender, age, experience, and voluntariness of use. These four major factors can be defined as follows:

1. Performance expectancy is defined as the degree to which an individual believes that using the system will help him or her to attain gains in job performance.
2. Effort expectancy is defined as the degree of ease associated with the use of the system.
3. Social influence is defined as the degree to which an individual perceives that important others believe he or she should use the new system.
4. Facilitating conditions are defined as the degree to which an individual believes that an organizational and technical infrastructure exists to support use of the system.

This research uses the framework which has been primarily developed based on the Unified Theory of Acceptance and Use of Technology (UTAUT) model introduced by Venkatesh et al. (2003). Such developments include the inclusion of the variables and factors that may affect the decision-making process of a potential user and the necessary modifications in accordance with the technologies as currently available.

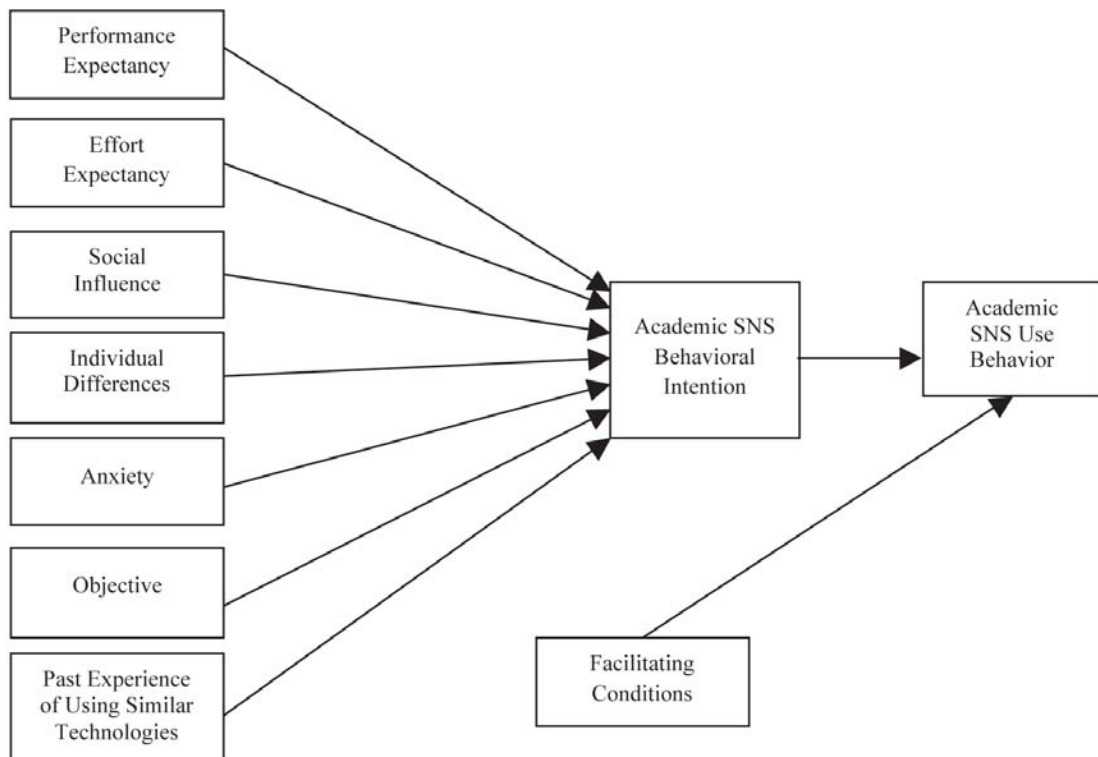


Figure 2: The Conceptual Framework of Acceptance and Use of Academic Social Network Site

Demographic Information

A questionnaire for gathering the data was created and distributed directly or via the Internet to 516 target respondents that were associated with Thai universities, including students, alumni and also instructors. The demographic information of the respondents is shown in Table 1.

Table 1: Characteristics of Data

Items	Respondent's Demographics	Frequency	Percent
Gender	Male	204	39.5
	Female	312	60.5
Age	≤ 20 years old	131	25.4
	21-25 years old	183	35.5
	26-30 years old	113	21.9
	31-35 years old	44	8.5
	≥ 35 years old	45	8.7
Education Level	Freshman	47	9.1
	Sophomore	71	13.8
	Junior	84	16.3
	Senior	65	12.6
	Master	79	15.3
	Ph.D.	28	5.4
	Alumnus	90	17.4
Faculty	Instructor	52	10.1
	Art	383	74.2
Campus Type	Science	133	25.8
	Campus	368	71.3
Location	Sub-Campus	148	28.7
	Capital	391	75.8
Income	Province	125	24.2
	≤ 10,000THB	253	49.0
	10,001-20,000 THB	157	30.4
	20,001-30,000 THB	48	9.3
	30,001-40,000 THB	29	5.6
Cost in Using Internet	≥ 40,000 THB	29	5.6
	≤ 250 THB	58	11.2
	251-500 THB	206	39.9
	501-750 THB	94	18.2
	751-1,000 THB	96	18.6
Using AcademicSNS	≥ 1,000 THB	62	12.0
	Not Use	105	20.3
	Use	411	79.7

The above table indicates that the universities campuses where most of the respondents were situated are major campuses in Bangkok. The majority of the respondents were undergraduate students with a low level of income/allowance that were studying in art-related fields.

Reliability Test

A reliability test was conducted to test the reliability of the hypothesized variables by analyzing the correlation between each item and the rest of the items. Cronbach's alpha in the reliability test demonstrated internal consistency among the items. In order to retain an item in a scale, the Cronbach's alpha in the reliability test should be 0.80 or higher. This test achieved a Cronbach alpha value of 0.950 from 132 items, which proved that the questionnaire's items were highly reliable.

Logistic Regression Model

Driving factor identification and knowledge extraction from expected users are important steps in developing a strategy for data mining. The logistic regression model was constructed based on the purpose of explaining how the determinants influence the use of academic social network sites. According to the results in Table 2, the value of 0.835 Nagelkerke R Square indicates that this logistic regression model accounted for 83.5% of variance.

Table 2: Model Summary

Step	-2 Log likelihood	Cox & Snell R Square	Nagelkerke R Square
1	130.941	.531	.835

According to Table 3, the Homer and Lemeshow Goodness-of-Fit was 0.692, which describes that the model accepts the null hypothesis that there is no difference between the observed and predicted values of the dependent variable, implying that the model's estimates fit the data at an acceptable level.

Table 3: Homer and Lemeshow Test

Step	Chi-square	df	Sig.
1	4.735	7	.692

Table 4: Result of Binary Logistic Regression

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Gender	-1.582	1.511	1.095	1	.295	.206
Age	.127	1.116	.013	1	.910	1.135
Education Level	-2.070	.923	5.030	1	.025	.126
Faculty	.191	1.935	.010	1	.921	1.211
University Location	.240	2.073	.013	1	.908	1.272
Campus Type	4.657	2.097	4.930	1	.026	105.269
Income	4.631	1.811	6.539	1	.011	102.589
Cost in Using Internet	1.617	.980	2.720	1	.099	5.036
Computer Ability	-1.149	1.121	1.051	1	.305	.317
Facebook	-4.698	1.762	7.107	1	.008	.009
Twitter	2.744	1.397	3.857	1	.050	15.544
LinkedIn	2.397	1.814	1.746	1	.186	10.992
YouTube	-4.046	1.641	6.084	1	.014	.017
Blog	-.584	.724	.650	1	.420	.558
MSN	-1.000	.692	2.089	1	.148	.368
File Storage Service	.883	.594	2.213	1	.137	2.418
Location Based Service	.833	.949	.771	1	.380	2.300
Skype	-2.844	1.066	7.124	1	.008	.058
BlackBerry Messenger	-3.862	1.484	6.773	1	.009	.021
Whatsapp	-3.016	1.088	7.689	1	.006	.049
Maximum Number of SNSs (registered)	2.076	.940	4.874	1	.027	7.971
Desktop	2.813	1.009	7.769	1	.005	16.666
Laptop	1.220	.586	4.332	1	.037	3.386
Tablet	.525	.619	.721	1	.396	1.691
Smartphone	1.436	.771	3.467	1	.063	4.203
Mobile Phone	2.955	1.089	7.363	1	.007	19.194
Home	5.648	1.936	8.511	1	.004	283.688

Table 4: Result of Binary Logistic Regression (continued)

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Office	-1.508	.657	5.264	1	.022	.221
Academic Institute	3.225	1.138	8.032	1	.005	25.143
Coffee Shop	-2.844	1.213	5.495	1	.019	.058
Internet Cafe	.943	.944	.998	1	.318	2.569
Park	.305	.929	.107	1	.743	1.356
Find Friend (Objective)	.656	.610	1.153	1	.283	1.926
Commercial (Objective)	-.368	.805	.209	1	.647	.692
News (Objective)	-1.324	.970	1.862	1	.172	.266
Entertainment (Objective)	-.012	.839	.000	1	.989	.988
Work (Objective)	3.285	1.187	7.664	1	.006	26.708
Learning (Objective)	2.372	1.071	4.911	1	.027	10.722
Communication (Objective)	2.800	1.402	3.989	1	.046	16.452
General Setting (Problem)	-1.320	.923	2.046	1	.153	.267
Posting (Problem)	-.800	1.182	.458	1	.498	.449
Security Setting (Problem)	-3.620	1.470	6.062	1	.014	.027
Multimedia Upload (Problem)	-4.732	1.736	7.433	1	.006	.009
Multimedia Download (Problem)	-3.726	1.575	5.597	1	.018	.024
Document Upload (Problem)	-2.779	1.541	3.252	1	.071	.062
Document Download (Problem)	-2.387	1.239	3.714	1	.054	.092
Privacy Setting (Problem)	-2.999	1.130	7.044	1	.008	.050
Communication (Problem)	-6.526	2.259	8.347	1	.004	.001
Find Friend (Problem)	-2.428	1.275	3.628	1	.057	.088
SNSs Learning Curve	-.859	.502	2.933	1	.087	.423
Fake Account (Stop Using)	-4.245	1.727	6.038	1	.014	.014
Internet Speed (Stop Using)	-5.722	2.381	5.776	1	.016	.003
Inappropriate Image (Stop Using)	-2.287	1.271	3.238	1	.072	.102
Radical Opinion (Stop Using)	-4.213	1.454	8.396	1	.004	.015
Privacy (Stop Using)	-3.392	1.490	5.184	1	.023	.034
Security (Stop Using)	-4.553	1.882	5.850	1	.016	.011
Hacker (Stop Using)	-.519	1.076	.232	1	.630	.595
Crime (Stop Using)	-1.825	1.263	2.089	1	.148	.161
Virus Computer (Stop Using)	-.174	.944	.034	1	.854	.840

Table 4: Result of Binary Logistic Regression (continued)

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Amount of Online Friend	-.569	.727	.613	1	.434	.566
Student (Influencer)	3.288	1.224	7.217	1	.007	26.786
Instructor (Influencer)	2.668	1.174	5.166	1	.023	14.415
Business Owner (Influencer)	-3.434	1.400	6.011	1	.014	.032
Artist (Influencer)	-1.820	.865	4.433	1	.035	.162
Family (Influencer)	1.442	1.439	1.004	1	.316	4.229
Reporter (Influencer)	-1.462	1.011	2.092	1	.148	.232
Athlete (Influencer)	.765	.937	.667	1	.414	2.149
Expert (Influencer)	-1.012	.903	1.256	1	.262	.364
Community (Continuous Use)	3.346	1.417	5.578	1	.018	28.402
Accomplishing Task (Continuous Use)	2.180	1.060	4.231	1	.040	8.849
Celebrity (Continuous Use)	-3.965	1.628	5.937	1	.015	.019
Features (Continuous Use)	1.012	.770	1.727	1	.189	2.750
Security (Continuous Use)	1.358	.964	1.986	1	.159	3.890
Application (Continuous Use)	1.258	1.078	1.361	1	.243	3.517
Game (Continuous Use)	-.387	.648	.356	1	.551	.679
Privacy (Continuous Use)	-.104	.974	.011	1	.915	.901
Educational Problem	3.155	1.182	7.129	1	.008	23.465
Online Student Ratio	4.043	1.636	6.108	1	.013	56.978
Online Instructor Ratio	1.833	.919	3.975	1	.046	6.253
Student (Privacy)	4.936	1.953	6.390	1	.011	139.208
Same Faculty Student (Privacy)	.115	.870	.017	1	.895	1.121
Friend of Student (Privacy)	.049	.859	.003	1	.955	1.050
Other Faculty Student (Privacy)	-.343	1.067	.103	1	.748	.710
Familiar Instructor (Privacy)	5.538	2.076	7.113	1	.008	254.196
All Instructor (Privacy)	1.864	1.315	2.010	1	.156	6.449
Officer (Privacy)	-3.287	1.277	6.630	1	.010	.037
All Academics (Privacy)	-4.107	1.513	7.370	1	.007	.016
Outsider (Privacy)	1.339	.958	1.955	1	.162	3.817
Relationship Instructor & Student	2.031	1.025	3.926	1	.048	7.620
Relationship Student & Student	2.971	1.340	4.918	1	.027	19.516
Relationship Instructor & Instructor	.723	.898	.648	1	.421	2.061

Table 4: Result of Binary Logistic Regression (continued)

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Relationship Student & Alumni	1.096	.758	2.091	1	.148	2.993
New Friend	3.457	1.483	5.431	1	.020	31.710
Participation	2.363	1.114	4.498	1	.034	10.621
Academic Performance	3.445	1.552	4.926	1	.026	31.354
Collaboration	2.134	1.075	3.941	1	.047	8.448
Communication	.365	1.279	.082	1	.775	1.441
Activity Benefit	.518	1.000	.269	1	.604	1.679
Transaction	1.970	.978	4.056	1	.044	7.171
Work Management	1.039	.905	1.317	1	.251	2.826
University Announcement	.594	.696	.729	1	.393	1.812
Student Counselor (Activity)	-4.489	1.836	5.981	1	.014	.011
Job (Activity)	1.670	.949	3.100	1	.078	5.313
Competition (Activity)	3.932	1.636	5.777	1	.016	50.993
Scholarship (Activity)	.367	1.089	.113	1	.736	1.443
Business (Activity)	1.253	.963	1.694	1	.193	3.501
E-Learning (Module)	5.433	1.918	8.020	1	.005	228.830
Video (Module)	5.677	2.187	6.740	1	.009	292.005
Real Time (Module)	.735	.815	.812	1	.368	2.085
Library (Module)	.571	.866	.435	1	.509	1.770
Score Announcement (Module)	3.549	1.681	4.461	1	.035	34.789
Announcement System (Module)	.473	.915	.267	1	.605	1.605
Alumni (Module)	4.387	2.217	3.917	1	.048	80.419
Activity (Module)	1.393	1.522	.837	1	.360	4.025
Enrollment (Module)	4.272	1.822	5.498	1	.019	71.695
Payment (Module)	1.173	.948	1.532	1	.216	3.233
Developer (Module)	2.966	1.197	6.135	1	.013	19.412
Privilege of Setting (Module)	3.136	1.463	4.594	1	.032	23.001
Location Based (Module)	.815	.929	.770	1	.380	2.260
E-commerce (Module)	1.797	1.038	2.997	1	.083	6.034
Private Group (Module)	-4.087	1.901	4.623	1	.032	.017
Follow (Module)	-4.017	1.579	6.473	1	.011	.018
FAQ (Module)	-.559	1.056	.281	1	.596	.572

Table 4: Result of Binary Logistic Regression (continued)

Variables	B	S.E.	Wald	df	Sig.	Exp(B)
Share to Other SNSs (Module)	.026	1.032	.001	1	.980	1.027
Responsibility of Internet Expense	-.892	.583	2.343	1	.126	.410
Other Media	-1.916	1.235	2.405	1	.121	.147
Personal Image	.068	.808	.007	1	.933	1.070
Happiness	-.450	1.106	.166	1	.684	.638
Submit Report	-1.541	1.223	1.587	1	.208	.214
Attitude	4.308	2.009	4.597	1	.032	74.291
Policy	4.116	1.954	4.437	1	.035	61.304
Constant	-80.156	25.045	10.243	1	.001	.000

Among the variables shown in Table 4, some are variables that exerted a significant influence in terms of possible impact on the decision to utilize social network sites in an academic environment. Regarding the demographic data, the most significant influence was campus type, and income and cost in using the Internet respectively. The majority of the respondents in this research already had basic mobile equipment to connect to an online platform. However, the levels of usage were different depending on affordability. It was obviously seen that there was a correspondence between the level of usage and the level of income. With the outcome of the research, it can be deduced that if the university would subsidize the cost relevant to the cost of using this academic platform, the level of usage would tend to increase. The use of Facebook, YouTube, BlackBerry Messenger, Whatsapp and Skype, which may be viewed as competitive technologies, may provide a negative impact on the decision to use a social network in an academic environment. These findings confirm that competitive technologies can distract and reduce the interest in, or the actual usage of, social networks. The users stated that desktops, laptops, smartphones, and mobile phones were the most appropriate devices for them to access academic platforms. Furthermore, they also indicated that home and academic institutes providing high speed Internet would be significant access points for them. Additionally, the ongoing educational issues of each individual may be one of the significant variables that motivate them to subscribe to a platform that would help them in resolving this kind of problem.

Regarding the significant issues and concerns involved in using online platforms, network communication problems, difficulty of security settings and privacy, and upload & download speed were critical in the decision to reject academic social network sites. The respondents indicated that slow Internet speed, sophisticated security systems deployed, and radical opinions from other users would mostly reduce the amount of their activities on social network sites and eventually give them a negative perspective towards these sites.

The significant expected benefits from implementing social network sites in an academic environment were limited mainly to personal relationships and productivity. Therefore, the system modules contributing towards implementation of these two expected benefits are implemented first to meet the expectations. Modules that would promote relationships and productivity would be, for example, online video and audio streaming, e-learning, and searching, listing, and recommending profiles of alumni and currently enrolled students with same educational backgrounds. The other modules providing additional features could be implemented later to go beyond users' expectation in order to ensure the success of this platform.

To sustain or increase the average level of usage of the site, groups of students and instructors who are existing members would be the best influencers for intended groups of non-members to adopt the site and use it regularly. Moreover, these two groups of existing members are the people who the non-members would like to share idea with and also to see, share, and write on their personal webpages. In addition, the users indicated that the online platform providing a good community and ability to accomplish certain tasks was the major reason for them to use academic social network sites regularly. Moreover, the online activities such as job counseling and educational competitions among users highly influenced them to use the sites regularly.

These findings confirm our understanding that these variables do have an impact on the use of new technology, as suggested by prior frameworks. However, the researcher did discover that some variables in this research were not conformity with prior theories. Demographic variables, gender, and age were usually the significant variables in most previous studies due to the belief that user

capabilities and requirements are varied based on these two variables. The research in the Thai academic environment, nevertheless, found that the gender and age of users were not important variables which could influence decisions to adopt social network sites for academic purposes. While the current use of existing sites, such as Facebook, may have a negative impact on the use and adoption of dedicated academic social network sites, Twitter, however, has been perceived in a different way as users of Twitter are more open towards the idea of accepting and adopting new academic social network sites. Interestingly, possible users in Thailand do not prefer to use tablet PCs to access academic platforms as tablet devices have not gain popularity when compared to the other types of devices. It was obviously seen in the results that users neither expected all of the benefits the research had listed nor preferred platforms with too many complex or difficult-to-use modules which may not be necessary for their activities. Therefore, the implementation of more features does not guarantee an increase in the number of users. The modules within the academic platform should be simple and useful, and provide convenience to the users in conducting their academic-related activities.

Celebrities such as reporters, athletes, and experts are not the influencers for the academic platform. Some groups may even have a negative influence on the usage of the academic platform. Furthermore, the number of registered instructors and students of a platform was seen to have a significant influence on the decision to adopt an academic social network platform. Furthermore, potential users of these academic platforms do not expect or want some types of academic activities, such as counseling, scholarships, and academic business to be provided via these platforms. In contrast to the UTAUT model, a positive attitude about the implementation of academic social network site led to a greater chance of respondents using this platform in the future. In addition, most of the users agreed with policies that supported the use of this academic platform for educational purposes.

With the variables of logistic regression significant at a 90% confidence level, as presented in Table 4, the user perception towards using social network site for the educational purposes such as e-learning in addition to social connections are summarized in Table 5 with the conclusions being based on the concepts of data mining.

Table 5: The Implications of the Relationship between the Probability of Significant Determinants and the Dependent Variable

Variables	Implications
Education Level	The lower the educational level, the greater the chance of respondents using academic social network sites in the future.
Campus Type	Respondents in sub-campus have more chance to use academic social network sites than on major campuses.
Income	The higher the personal income/allowance, the greater the chance of respondents using academic social network sites in the future.
Cost in Using Internet	The higher the cost in using the Internet, the greater the chance of respondents using academic social network sites in the future.
Facebook	The use of Facebook has a negative influence on the use of academic social network site. Therefore, the use of Facebook may decrease the probability of using academic social networks.
Twitter	The use of Twitter has a positive influence on the use of academic social network site. Therefore, the use of Twitter may increase the probability of using academic social network sites.
YouTube	The use of YouTube has a negative influence on the use of academic social network site. Therefore, the use of YouTube may decrease the probability of using academic social network sites.
Skype	The use of Skype has a negative influence on the use of academic social network site. Therefore, the use of Skype may decrease the probability of using academic social network sites.
BlackBerry Messenger	The use of BlackBerry Messenger has a negative influence on the use of academic social network site. Therefore, the use of this application may decrease the probability of using academic social network sites.
WhatsApp	The use of smartphone applications such as WhatsApp has a negative influence on the use of academic social network site. Therefore, the use of this application may decrease the probability of using academic social network sites.
Maximum number of SNSs (registered)	Respondents that are registered at several social network sites are more likely to use academic social network sites in the future.

Table 5: The Implications of the Relationship between the Probability of Significant Determinants and the Dependent Variable (continued)

Variables	Implications
Desktop	The respondents using desktops for the connection to social network sites are more likely to use academic social network platforms in the future.
Laptop	The respondents using laptops for the connection to social network sites are more likely to use academic social network platforms in the future.
Smartphone	The respondents using smartphones for the connection of social network sites are more likely to use academic social network platforms in the future.
Mobile Phone	The respondents using mobile phones for the connection of social network sites are more likely to use academic social network platforms in the future.
Home	The respondents that use social networks at home are more likely to use academic social network platforms in the future.
Office	According to the regulations of several companies in Thailand, it is difficult to use social networks while working in the office. Therefore, the office as an access point may decrease the probability of using academic social network platforms.
Academic Institutes	The respondents that use social networks at university or academic institutes are more likely to use academic social network platforms in the future.
Coffee Shop	Some group of users usually access social networks at coffee shops. However, the cost of drinks or Internet connection at coffee shops is quite expensive. Therefore, coffee shops as an access point may decrease the probability of using academic social network platforms.
Work (Objective)	The respondents that usually use social networks for work are more likely to use academic social network sites.
Learning (Objective)	The respondents that usually look for information/knowledge via social network sites are more likely to use academic social network sites in the future.

Table 5: The Implications of the Relationship between the Probability of Significant Determinants and the Dependent Variable (continued)

Variables	Implications
Communication (Objective)	The respondents that usually communicate with others via social network sites are more likely to use academic social network sites in the future.
Security Setting (Problem)	Any problems related to setting up security of the platform will decrease the probability of using academic social network sites in the future.
Multimedia Upload (Problem)	Any problems related to uploading multimedia files will decrease the probability of using academic social network sites in the future.
Multimedia Download (Problem)	Any problems related to downloading multimedia files will decrease the probability of using academic social network sites in the future.
Document Upload (Problem)	Any problems related to uploading document files will decrease the probability of using academic social network sites in the future.
Document Download (Problem)	Any problems related to downloading document files will decrease the probability of using academic social network site in the future.
Privacy Setting (Problem)	Any problems related to setting up the privacy of a platform will decrease the probability of using academic social network sites in the future.
Communication (Problem)	Any problems related to the communication system within the platform will decrease the probability of using academic social network sites in the future.
Find Friends (Problem)	Any problems related to using the platform to search for new friends will decrease the probability of using academic social network sites in the future.
SNSs Learning Curve	The less the amount of time required to learn to use social network sites effectively, the higher the chance of respondents using academic social network sites in the future.
Fake Account (Stop Using)	Fake accounts and forged computer data can decrease the probability of continuous use of academic social network sites.

Table 5: The Implications of the Relationship between the Probability of Significant Determinants and the Dependent Variable (continued)

Variables	Implications
Internet Speed (Stop Using)	The lack of high-speed Internet can decrease the probability in the continuous use of academic social network sites.
Inappropriate Image (Stop Using)	Inappropriate images and content in social networks can decrease the probability of continuous use of academic social network sites.
Radical Opinion (Stop Using)	Radical opinions posted on platforms can decrease the probability of continuous use of academic social network sites.
Privacy (Stop Using)	Privacy infringement can decrease the probability of continuous use of academic social network sites.
Security (Stop Using)	Ineffective security systems of social network platforms can decrease the probability of continuous use of academic social network sites.
Student (Influencer)	Students are one of the important influencers that can increase the probability of using academic social network sites.
Instructor (Influencer)	Instructors are influencers that can increase the probability of using academic social network sites.
Business Owner (Influencer)	Business owners are not influencers of academic platforms. Further, this group of users may decrease the probability of using academic social network sites.
Artist (Influencer)	Artists are not influencers of academic platforms. Additionally, this group of users may decrease the probability of using academic social network sites.
Community (Continuous Use)	Communities within the social network platforms are the most important factor which leads to the continuous use of academic social network sites.
Accomplishing Task (Continuous Use)	Social network platforms can be used to accomplish tasks that lead to the continuous use of academic social network sites.

Table 5: The Implications of the Relationship between the Probability of Significant Determinants and the Dependent Variable (continued)

Variables	Implications
Celebrity (Continuous Use)	Celebrities in academic platforms may decrease the probability of continuous use of academic social network sites.
Educational Problem	The higher the level of education-related problems, the greater the chance of respondents using academic social network sites in the future.
Online Student Ratio	The total amount of users (student) is the key factor which influences respondents to use academic social network sites.
Online Instructor Ratio	The total amount of users (instructor) is the key factor which influences respondent to use academic social network sites.
Student (Privacy)	The platform which allows other close students to share content and images on the user's webpage will enhance the probability of academic social network site usage.
Familiar Instructor (Privacy)	The platform which allows other familiar instructors to share content and images on the user's webpage will enhance the probability of academic social network site usage.
Officer (Privacy)	The platform which allows university officers to share content and images on the user's webpage will decrease the probability of academic social network site usage.
All Academics (Privacy)	The platform which allows all of the people in the university to share content and images on the user's webpage will decrease the probability of academic social network site usage.
Relationship Instructor & Student (Benefit)	If the social network site can provide benefits in terms of the relationship between instructor and student, there will be a greater chance of respondents using academic social network sites.
Relationship Student & Student (Benefit)	If the social network site can provide benefits in terms of the relationship among students, there will be a greater chance of respondent using academic social network sites.

Table 5: The Implications of the Relationship between the Probability of Significant Determinants and the Dependent Variable (continued)

Variables	Implications
New Friend (Benefit)	If the social network site can provide benefits related to having more new friends in the university, there will be a greater chance of respondents using academic social network sites.
Participation (Benefit)	If the social network site can provide benefits related to obtaining more participation from students, there will be a greater chance of respondent using academic social network sites.
Transaction (Benefit)	If the social network site can provide benefits related to university transactions, there will be a greater chance of respondents using academic social network sites.
Academic Performance (Benefit)	If the social network site can provide benefits related to academic performance enhancement, there will be a greater chance of respondents using academic social network sites.
Collaboration (Benefit)	If the social network site can provide benefits related to the enhancement of collaboration, there will be a greater chance of respondents using academic social network sites.
Job (Activity)	Activities such as job recommendations increase the chance of respondents using academic social network sites continuously.
Student Counselor (Activity)	Activities such as student counseling online decrease the chance of respondents using academic social network sites continuously.
Competition (Activity)	Activities such as online competitions among users increase the chance of respondents using academic social network sites continuously.
E-Learning (Module)	Integration of e-learning features within the academic platform increases the chance of respondents using academic social network site.
Privilege of Setting (Module)	Allowing users to set up the appearance of their own web pages increases the chance of respondents using academic social network sites.

Table 5: The Implications of the Relationship between the Probability of Significant Determinants and the Dependent Variable (continued)

Variables	Implications
Developer (Module)	Allowing users to develop applications on academic platforms increases the chance of respondents using academic social network sites.
Enrollment (Module)	Integration of online enrollment features within academic platforms increases the chance of respondents using academic social network sites.
Alumni (Module)	As a module can support alumni to continuously use academic platforms after graduation, there is a greater chance of respondent using academic social network sites.
Score Announcement (Module)	Announcing scores on academic platforms increases the chance of respondents using academic social network sites.
E-Commerce (Module)	Integration of e-commerce features on academic platforms increases the chance of respondents using academic social network sites.
Private Group (Module)	Allowing the creation of private groups of users decreases the chance of respondents using academic social network sites.
Follow & Follower (Module)	Allowing users to follow other users decreases the chance of respondents using academic social network sites.
Video (Module)	Allowing users to download and watch multimedia files (video/ audio) for academic purposes on the platform increases the chance of respondents using academic social network sites.
Attitude	A positive attitude about the implementation of academic social network site will lead to a greater chance of respondents using this platform in the future.
Policy	Setting policy to use academic social network sites for learning and teaching increases the chance of respondents using academic social network sites in the future.

K-Mean Clustering Analysis

As a result of the logistic regression not being entirely in conformity with the theory, this research further conducted cluster analysis to study the behaviors of intended users more specifically and to identify the segment which caused the different levels of impact. In this research, k-mean clustering analysis technique was used to categorize the cases to be cluster-based on the shortest distance between the cluster mean and case. With this technique, the researcher could identify and determine the relevant segments based on the characteristics of each user.

According to the results of the cluster analysis, the 516 respondents could be categorized into at least three segments based on the usage characteristics of each respondent. The first segment consisted of 240 respondents (46.5% of the total sample size). This segment often uses a variety of communication technologies in their daily life. Most respondents prefer to use numerous social network platforms at the same time. Moreover, it is not difficult to invite this segment to try new educational technology because most of them display leader characteristics and are ready to adopt the social network implemented in academic institutes.

The second segment displays various perspectives concerning the implementation of academic platforms, which are mostly neutral. This segment consisted of 225 users (43.6% of the total sample size). Most of the people in this segment do not prefer to subscribe to or use a number of social network sites. According to aforementioned behavior, this segment may think carefully before they subscribe to new platforms. Although most of them will adopt academic social platforms as the first segment, this segment is called mainstream followers because they usually take time to consider the results of usage before making a decision to adopt new academic technology.

The third segment was the smallest group, consisting of only 51 respondents (9.9% of the total sample size). Most respondents in this segment use some of the current social networks such as Facebook, YouTube, and so forth. In addition, they believe that those current technologies meet their requirements without any problems. Therefore, it is not necessary for them to subscribe to more social network sites, particularly academic platforms. Moreover, this segment does not

believe that the implementation of social network sites in the academic environment would lead to any benefits such as academic performance or relationships.

Conclusion and Recommendations

There are two main reasons that prior technologies for education have not been widely accepted by the majority of academic users. The first reason is that the modules and features of prior technologies do not sufficiently meet the expected benefits of academic users. The modules of technologies of the past were developed as individual modules and it was extremely difficult to build a strong online society, which is one of the most powerful factors in sustaining an academic platform. Nowadays, the electronic communication technology, such as social network sites, is regarded as a potential tool to build strong online communities and even act as a tool to improve current learning and teaching processes. Nevertheless, current public social network sites are intended to be used for general purposes and for the relationships of each individual rather than for a specific purpose such as education. Moreover, the current public social network sites lack integration with the internal resources of academic institutes. Therefore, the modules and features of those technologies cannot efficiently support current educational processes. This research confirms that demands to use social network technology in the academic environment exist. In order to satisfy those demands, social network technology should be properly implemented and managed in ways that are different from the past. In order to succeed in the implementation of educational technology, the embedded modules should meet the expected benefits in not only increasing the relationships among users but also in providing more opportunities to accomplish academic-related tasks.

Another reason for non-acceptance was that the concept of data mining has not been fully applied in the implementation of academic platforms. With the help of the logistic coefficient and the magnitude of effect in this research, developers can obtain users' insights and understand the behavior of users. These findings would assist developers in understanding how to acquire, manage, and maintain users on academic platforms. For instance, some of the novel and advanced modules may be not important because the characteristics of Thai users are different

from those in other countries. Several scholars normally suggest that real time communication is one of the most important modules that users expect in academic platforms. In contrast, the results have indicated that the characteristic of most academics, at least in Thailand, is to be passive. Most of them are accustomed to one-way communication and do not prefer to express their ideas in real time. Therefore, real time communication or learning modules is not a fundamental module which can guarantee success in this country. In addition, the developer of the system can use the results to adjust the strategies in providing those online academic activities. Regarding the results, several academic activities are not appropriate to the online social network platform because those activities are more effective and suitable for traditional face-to-face (offline) activities. Thus, offline activities are also required to strengthen the online academic community. All in all, the developer of the system should carefully consider the behavior and demand of users so that he or she can choose the correct strategy to manage and balance online and offline activities.

In this research, k-mean clustering analysis may not have clearly classified the user segments, as the social network technology is not currently implemented in any academic environment in Thailand. The researcher believes that actual implementation of the technology would build an online academic community that would grow rapidly, which would result in better understanding of the segmentation of users; more so than currently. With better understanding of the needs of each segment, the developer of the system could enhance each of the system components and modules and their interactions to better suit each segment of users.

Acknowledgement

The author would like to express gratitude to Dr. Poondej Krairit for his encouragement, ideas, vision, and support. His valuable experience and attitude was essential to the completion of this research. Special thanks to Dr. Chanintorn Jittawirayanukoon, who provided continuous support and guidance throughout my research, and to Dr. Chamnong Jungthirapanich, who inspired me to pursue

my doctoral degree. Thanks also to Mr. Pho Zanaka who dedicated his precious time to support and encourage me.

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