Research Article

Social Network System in Classroom: Antecedents of Edmodo © Adoption

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Abstract

Social networks provide various benefits to educational settings. Nevertheless, a dominant social network tool like Facebook is not suitable for classroom, due to lacks of privacy concerns. Edmodo is a private social network that is claimed to provide a secure learning platform for learners and educators. Although Edmodo is a Facebook-like tool, it has not yet prevalent for educational usage. Thus, this research's objectives are to study antecedents of Edmodo adoption as a classroom collaboration tool, to compare the effect of antecedents, to explore university students' views about Edmodo, using Thailand case. The results are applied to give guidelines for lecturers, to effectively apply Edmodo in their classroom. Studied factors consist of two perception factors, one instructor factor, and one student factor. Perceived usefulness, perceived ease of use, and instructor characteristics are the strong predictors of Edmodo acceptance.

Keywords: Edmodo, Technology acceptance model (TAM), Adoption, Acceptance Factors

Introduction

Web 2.0 has changed the way users consume contents. The main characteristic of Web 2.0 tools is users' active participation in the content of creation process. According to academic studies, the use of Web 2.0 in education is important to remain relevant and to meet needs of students in the twenty-first century (Ollis, 2011). Advantages of using Web 2.0 in education are creating new interaction styles between instructors and students, promoting students interaction outside classrooms, boosting collaboration on group projects, enhancing students' experience from active environments, responding students immediacy, sharing just-in-time contents to peers or students in other schools, and linking lecture information and assignments to various digital resources (e.g. blogs, RSS, multimedia clips, wikis, and internet resources) (Campos and Garaizar, 2010; Halm et al., 2012; Elmas and Geban, 2012; Holland and Muilenburg, 2011). Web 2.0 Tools consist of blog, micro blogs, wiki, podcast, and social networks (Koçak-Usluel and Mazman, 2009). Social networks are social-tie structures which support participation, interaction, resource sharing, and socialization of common interest groups (Griffith and Liyanage, 2008; Newman and Park 2003; (Koçak-Usluel and

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Mazman, 2009)). They are proven to enhance students' learning experience and to create many advantages in informal learning (Mirabolghasemi and Huspi, 2012; Potter, 2006). Online social networks are also confirmed to be effective teaching tools because most students already have accounts and their platforms are ready-to-use (Towner et al., 2007). Comparing to traditional content management systems (CMS) tools, social network sites provide additional features that are media sharing, RSS, tagging, own brand and visual design, real time activity stream, groups, friends, and profile pages (Mirabolghasemi and Huspi, 2012; Brady et al., 2010). Some usages of social networks in higher education are library uses, faculty uses, and administrative uses for content generating, sharing, interacting, and socializing (Roblyer et al., 2010; Hamid et al., 2009).

In the case of e-learning in developing countries, Andersson and Grönlund (2009) do a critical literature review about comparing major challenges between developing countries and developed countries. The research identifies 30 challenges that are grouped into four main categories: course challenges, challenges pertinent to individuals' characteristics, technological challenges, and contextual challenges. Major challenges which are emphasized in developing countries are course, technology, and contextual challenges, whereas challenges related to individuals' characteristics have not yet been focused in developing countries. Bhuasiri et al. (2012) investigate the key success factors affecting e-learning systems in developing countries. The research specifies 6 dimensions of 20 critical success factors. Six dimensions are learners' characteristics, instructors' characteristics, institution and service quality, infrastructure and system quality, course and information quality, and extrinsic motivation. For Thai context, Siritongthaworn and Krairit (2004) investigate the common construct of the students' use of e-learning. The result shows three main interactions that are human-to-human interactions, human-to-non-human interactions, and access duration. Siritongthaworn et al. (2006)

identify factors influencing the level of e-learning success in Thai universities. Three main drivers are characteristics of the organization, the instructor and the Internet environment. One key barrier is the student preference for instructor-led learning. Pagram and Pagram (2006) explore Thai perspectives about e-learning and propose the suggestion for Thai e-learning designers. In sum, the result points that Thai educators should customize instructional design and development of e-learning materials to fit Thai students such as e-learning should be used as the supported tool rather than replacing classroom learning; chat, discussion groups, and video conferencing can provide the sense of community to online learners; and so on. Siritarungsri and Suwansumrit (2011) study the use of Webcasting to support graduate nursing students. Using this tool can lead to nursing learning achievements from giving students chances to build online social communities, share their health education knowledge with others, and gain writing and presentation skills.

Social networks are not extensively adopted in the education filed as much as in other fields (Duncan and Chandler, 2011; Mazman and Koçak-Usluel, 2009). Some social networks tools were applied in teaching and learning such as Twitter, Twiducate, Facebook, Edmodo, and Ning (Mirabolghasemi and Huspi, 2012; Roblyer et al., 2010; Hineman and Norris, 2011; Forte et al., 2012; Galán, 2011)[15](Brady et al., 2010) (Mack et al., 2007). Facebook is the most popular social network which reached one billion active users as of October, 2012. It also has many features including wall, pokes, news feeds, photos, etc. Even though, social networks, especially Facebook, has been widely criticized for privacy vulnerabilities (Roblyer et al., 2010; Campos and Garaizar, 2010; Galán, 2011). So, social networks dedicated to education such as Yammer, Edmodo, or Ning are suggested to be used (Campos and Garaizar, 2010; Galán, 2011). Edmodo is a private social platform which provides a secure space for teachers and students to connect and to collaborate (Duncan and Chandler, 2011; Halm et al.,

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2012). It is easy to apply to classrooms since its appearance is similar to Facebook, that many students are already familiar with (Haefner and Hanor, 2012; Holland and Muilenburg, 2011). However, those students need to be made aware of what constitutes the social networks tool and to be suggested the opportunity to use it for meaningful purposes (Ng, 2012).

There are only few researches regarding academic usages and educational benefits of social networks in education (Mirabolghasemi and Huspi, 2012; Brady et al., 2010). For instance, relationships between friendship networks, advising networks, and adversarial networks and students' performance were studied by Yang and Tang (2003). Online discussion group was applied to be an additional tool in Cooper's class. Students' point of views, online group work is suitable for an accelerated course (Cooper, 2009). Mazman and Koçak-Usluel (2009) present a theoretical model which contains factors possibly affecting adoption of social network applications for usage in educational context. Four factors influencing adoption process are social factors, perceived ease of use, perceived usefulness and innovativeness. Facilitating conditions, image, subjective norms and community identity, are proposed to be antecedents of these direct four constructs. Koçak-Usluel and Mazman (2009) also propose a model for Web 2.0 adoption in distance education incorporating Diffusion of Innovation Theory, Theory of Reasoned Action, Theory of Planned Behaviour, Technology Acceptance Model I and II and Unified Theory of Acceptance and Use of Technology. Nevertheless, model testing and the hypotheses verification of both models are postponed to future works. Koçak-Usluel and Mazman (2010); later explore students' Facebook adoption process in the educational use. The adoption positively relates to usefulness, ease of use, social influence, facilitating conditions, and community identity. Students' purposes positively relates to users' social relations, work related issues, and daily activities. Lahadi et al. (2009) specify an opportunity to apply Edmodo as an enhanced tool in blending learning for

course management systems, Moodle. Brady et al. (2010) surveyed graduate students using Ning in distance learning courses. The results suggest that education-based SNSs can be effectively applied in the higher distance education courses as a tool for improved online communications. Cheung et al. (2010) explore factors driving the commitment of a student to participate in joint action, called We-intention, to use Facebook. The result shows that most powerful factor is the social presence. Visagie and de Villiers (2010) investigate reasons why lecturers use or not use Facebook in education. The result indicates that lecturers from South Africa, Australia, Canada, United States of America, and United Kingdom consider Facebook as an academic tool. Holland and Muilenburg (2011) studied students' participations in literature discussions, using Edmodo discussion boards. Student participation, student engagement, complexity of discussion, and the effectiveness of Edmodo platform are discussed. Nevertheless, none of these researches investigate influences of instructor characteristics, student characteristics, and past behaviour factors on private social networks' adoption in education.

Therefore, objectives of this paper are to enhance prior researches by combining the technology acceptance model (TAM) with instructor characteristics, student characteristics, and students' past behaviours; to investigate impacts of acceptance constructs (perceived usefulness and perceived ease of use), instructor-related construct (instructor characteristics), and student-related constructs (student characteristics and past behaviour) on Edmodo adoption; to reveal students' views about applying Edmodo as a classroom collaboration tool; and to guide educators in productively encouraging students to participate in online social networks for teaching and learning purposes.

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Edmodo Adoption Constructs

The constructs in this study were adapted from a well-known model, TAM, and previous researches. The proposed model assumed that the dependent variable (Intention to Use) is affected by independent variables that are perceived usefulness, perceived ease of use, instructor characteristics, different types of student characteristics (Dependent/ Collaborative/ Independent), and past behaviour. Table 1 shows literature sources of each construct.

Table 1: Constructs in This Study and Their Literature Sources

Constructs	Sources
Perceived Usefulness	(Venkatesh and Bala, 2008)
Perceived Ease of Use	(Venkatesh and Bala, 2008)
Instructor Characteristics	(Selim, 2007)
Student Characteristics: Dependent	(Charkins et al., 1985)
Student Characteristics: Collaborative	(Charkins et al., 1985)
Student Characteristics: Independent	(Charkins et al., 1985)
Past Behaviour	(Conner and Armitage, 1998)
Intention to Use	(Venkatesh and Bala, 2008)

Regarding acceptance constructs, Technology acceptance model (TAM), an extensively used theory in the information systems field, specifies two important factors influencing intention to adopt technology: perceived usefulness and perceived ease of use (Davis, 1989). TAM is later developed to TAM3 by Venkatesh and Bala (2008). TAM3 also specifies that both perceived usefulness and perceived ease of use are significantly related to new information technologies adoption in the workplace (Venkatesh and Bala, 2008). Perceived usefulness is the most important determinant of behavioural intention for all time period of information technology usages. It positively affects intention to use social network sites. Perceived ease of use has a positive influence on intention to accept general social network sites too (Sledgianowski and Kulviwat, 2008). Mazman and Koçak-Usluel (2010) indicate that perceived usefulness and perceived ease of use have positive effects on Facebook adoption in academic usage. The usefulness of education-based social network, Ning, is also confirmed by students in terms of allowing more frequent collaboration with peers and colleagues within a course, allowing them to communicate more effectively, more convenient than face-to-face classes for sharing and discussing ideas (Brady et al., 2010). Students also perceived the usefulness of using social networks for classwork in terms of convenient (Roblyer et al., 2010). Towner et al. (2007) confirm that students agree that Facebook is a useful tool for them and their class-related collaborations. Therefore, the first hypothesis and the second hypothesis are proposed as follows:

H1: Perceived usefulness is positively associated with the intention to use.

H2: Perceived ease of use is positively associated with the intention to use.

Regarding instructor-related construct, Lahadi et al. (2012) emphasize roles of educators in establishing a clear purpose of social networks usage for students, encouraging students to respond to other students, updating materials and course topics, etc. Because students have a limited understanding of how technology could support their learning, instructors are

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needed to know how to use the tools, systematically model their usage in classrooms, explicitly guide their students about the tools, and continue supports (Ng, 2012; Behnke et al., 2012). Volery and Lord (2000) summarize that instructor characteristics are one of key success factors in e-learning. Selim (2007) is identified that instructor characteristics in terms of instructor's attitude and control of the technology and instructor's teaching style are important for e-learning adoption. Effective educator is the one who teaches the use of humor, stories, enthusiasm, and self-disclosure (Marzer et al., 2007) In addition, Instructor engagement is pointed to be one of key components in online courses too (Roblyer et al., 2010). Therefore, the third hypothesis is proposed as follows:

H3: Instructor characteristics are positively associated with the intention to use.

Regarding student-related constructs, learning styles of students in terms of collaborative, independent, and dependent, affect learning and attitudes in the introductory economic course. Collaborative students are students who like classes with as many discussions as possible. Dependent students are students who like classes with lecture-based settings and prefer as many as guidelines from their instructors. Independent students are students who like classes giving opportunities to them to express opinions about courses' structures and contents (Charkins et al., 1985). In addition, different needs of learners are required different teaching styles to fulfil them. For instance, students who mainly want to get good grades, prefer instructors who help them to achieve their goals with low efforts. Students who have high intrinsic goals and low extrinsic goals, want instructors to put high demands on their learning, to encourage their critical thinking, and to ask for their self-studies and effort investments (Hativa and Birenbaum, 2000). Distance learning students favour independent learning styles. Dependent learners are more prefer on-campus classes than online distance classes (Diaz, 1999). Diaz (2000) also

specifies that successful distance learning students (grade better than 'C') are the independent type. Therefore, the forth hypothesis to the sixth hypothesis are proposed as follows:

H4: Student characteristic (Dependent) is negatively associated with the intention to use.

H5: Student characteristic (Collaborative) is positively associated with the intention to use.

H6: Student characteristic (Independent) is positively associated with the intention to use.

Regarding student-related constructs, past habit influences intention and behaviour in the theory of planned behaviour (TPB) (Conner and Armitage, 1998). Attitude-behaviour consistency is also affected by direct behavioural experience (Regan and Fazio, 1977; Regan and Fazio, 1978). Early et al. (1993) point the importance of past experience or past behaviour on shaping intentions. The level of knowledge or experience with negotiation support systems (NSS) can be beneficial for building the intention to adopt the system (Lim, 2002). Pre-existing experience with social networks can make students able to use Edmodo's discussion boards and move from a teacher-centred question to a student-to-student discussion smoothly (Holland and Muilenburg, 2011). Therefore, the seventh hypothesis is proposed as follows:

H7: Past behaviour is positively associated with the intention to use.

Research Methodology

Instrument Development

A questionnaire is developed based on the research model, by adapting constructs from literature sources as shown in Table 1. The questionnaire composes of 21 questions. First question to fourth question (USEF1-USEF4) measure perceived usefulness; for example, "Using Edmodo will enhance my learning efficiency", "Edmodo will be useful to me". Fifth

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question to eighth question (EASE1-EASE4) measure perceived ease of use; for instance, "I do not need so much time to learn how to use Edmodo", "Using Edmodo is easy for me". Ninth question to twelfth question (INCH1-INCH4) measure instructor characteristics; for example, "Teacher always encourages me to participate in the class", "Teacher pays attention to students such as giving suggestions, answering questions, etc...". Thirteenth question to fifteenth question (INTU1-INTU3) measure intention to use Edmodo; for instance, "If I can access Edmodo, I will use It.", "I will use Edmodo during these one or two weeks". All above opinions are asked with the question "What do think about the following statements?" and answer choices in five points Likert scale (1 = strongly disagree, 5 = strongly agree). Student characteristic (sixteenth question), preference of Edmodo features (seventeenth question), gender (eighteenth question), and frequent access device (twentieth question) are collected using nominal scales. Examples of student characteristic questions are "I prefer to mainly have lectures in the classroom. I like the teacher to set topics and to describe clear details of assignments to me" – Dependent, "I like learning with as many as classroom discussions and interactions. I prefer group projects or learning from case studies." – Collaborative, "I like to participate in determining the course content and structure. If any assignments are given, I prefer to set the topics." – Independent. Student characteristics variables were later treated as dummy variables. Nineteenth question (PAST) measure past behaviour in ratio scale with the question "How long have you used other social networks such as Facebook?". Last question is an open question about suggestions from students about using Edmodo to enhance classroom collaboration.

Data Collection

Online surveys created in Google Docs, with a convenience sampling, were used to collect the data. Questionnaires were sent to students of ____, ____ University, who took the Management Information System (MIS) course which applied Edmodo as a tool for classroom collaboration. This course is an introductory course for undergraduate students of all majors, not only MIS major. Two hundred and twenty nine questionnaires were sent. A total of 182 questionnaires were collected (a response rate 79.5 percent).

Data Analysis and Results

Respondents' Profiles

Respondents' profiles and their usage preferences were analysed by descriptive statistics: frequency and percentage. Of 182 participants, 133 students (73.1%) are female and 49 students (26.9%) are male. Most repeatedly used features of Edmodo are turn-in assignments (62%), note/alert (20%), comments (7%), attachments (7%), never posts or giving comments (4%), and calendar (1%) respectively, as shown in Figure 1. Figure 2 presents main access devices to use Edmodo are personal notebook computers (53.3%), mobile phones (32.97%), personal desktop computers (6.04%), and public school computers or internet cafes (4.4%), and other devices (3.3%).
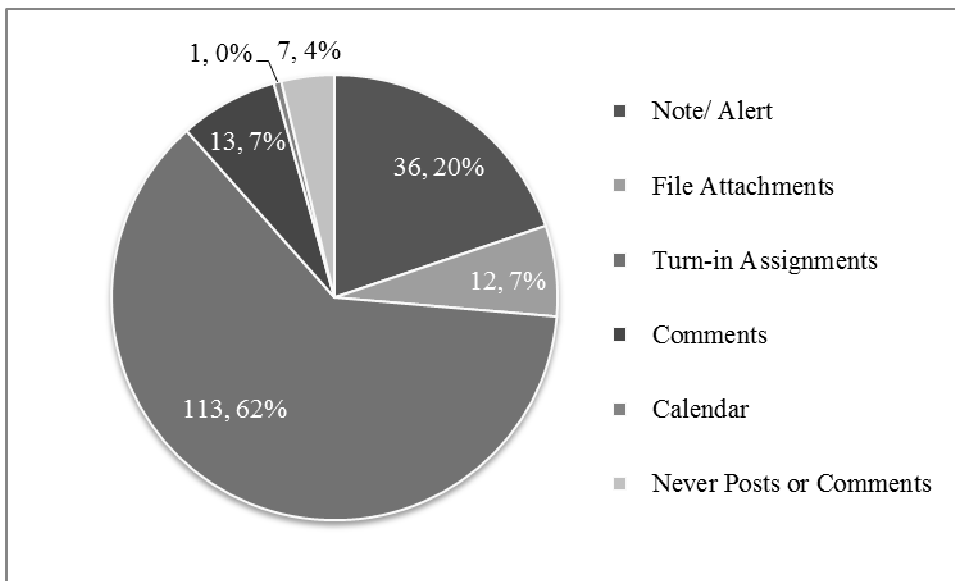
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Fig 1:   Most Frequently Used Features of Edmodo

Reliability and Factor Analysis

The survey instruments were tested to assess their construct reliability and validity. Cronbach's alpha of each construct was assessed. EASE3 and INCH4 were deleted. Internal consistency of all factors are high since all Cronbach's alphas are greater than 0.8. Cronbach's alpha of INTU1-INTU3 is 0.794. Factor analysis were applied to check convergence validity (factor loadings are greater than 0.5) and discriminant validity (items were loaded with the right factor) and to form constructs from survey items. Principal axis factoring method with varimax rotation was applied. Three factors with eigenvalues more than 1 were derived. All factors can explain 72.533 percent of the cumulative variance of ten items as shown in Table 2.
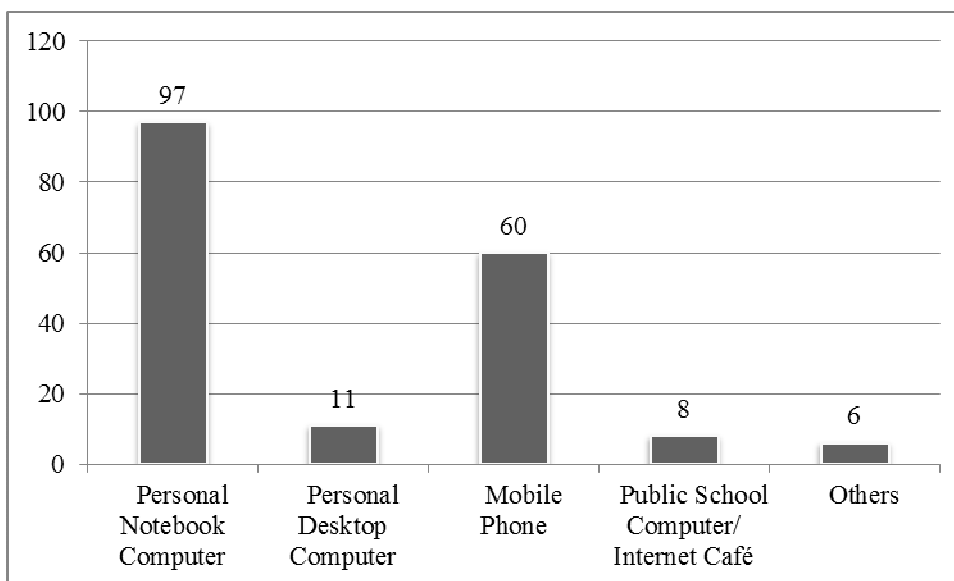
Figure 2: Main Access Equipment

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Table 2: Results of Component Reliability Analysis and Factor Analysis

ITEMS	Factor 1 (USEFS)	Factor 2 (EASES)	Factor 3 (INCHS)	Cronbach's alpha
USEF4	.826			.848
USEF1	.822			
USEF2	.811			
USEF3	.763			
EASE2		.894		.812
EASE1		.858		
EASE4		.762		
INCH2			.901	.804
INCH3			.865	
INCH1			.688	
% of Variance	28.041	22.705	21.787	
Cumulative %	28.041	50.746	72.533	

Test of Model

Pearson correlation analysis was performed among independent variables: perceived usefulness (USEFS), perceived ease of use (EASES), instructor characteristics (INCHS), student characteristics (Dependent – STCH1, Collaborative – STCH2, and Independent – STCH3), and past behaviour (PAST). If the correlation between predictors is between 0.80 and 0.90, such predictor should not be included for the multiple regression analysis due to multicollinearity (Gururajan and Gururajan, 2008). Since the correlation between predictors STCH1 and STCH2/ STCH3 is significant and relatively high (r = -.881, p < .01/ r = .331, p < .01), STCH1 was excluded from further analysis.

Relationships between six predictors (PAST, STCH2, EASES, USEFS, INCHS, STCH3) and a dependent variable (INTUS) are then explored by multiple regressions

(enter method). The multiple correlation coefficient "R" for six predictors as shown in Table 4 represents the combined correlation of these predictors with the dependent variable (R = .667). The adjusted R square (R2 = .426) indicates that 42.6 percent of the variations in the Intention to Use can be explained by combined adoption factors.

Tolerance and Variance Inflation Factor (VIF) were assessed to check multicollinearity. Tolerance less than 0.2 or 0.1 and VIF greater than 10 reveal collinearity problems (O'brien, 2007). All independent variables pass multicollinearity analysis with tolerance more than 0.9 and VIF less than 1.07, as described in Table x. From the above result, three of six independent variables (perceived usefulness, perceived ease of use, instructor characteristics) were found

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to be significantly contributing to the prediction of dependent variable (intention to use) with p-value less than 0.01. Most influential factors for Edmodo adoption as a tool for classroom collaboration are perceived usefulness (b = 0.593, p = 0.000), perceived ease of use (b = 0.241, p = 0.000), and instructor characteristics (b = 0.164, p = 0.005) consecutively.

Table 3: Correlations Analysis of Predictors

Correlations			USEFS2	EASES2	INCHS2	STCH1	STCH2	STCH3	PAST
USEFS	Pearson Correlation		1	0	0	0.087	-0.08	-0.021	-0.144
	Sig. (2-tailed)			1	1	0.245	0.283	0.775	0.052
EASES	Pearson Correlation		0	1	0	-0.067	0.004	0.131	-0.016
	Sig. (2-tailed)		1		1	0.37	0.953	0.079	0.826
INCHS	Pearson Correlation		0	0	1	-0.176	.192**	-0.016	0.077
	Sig. (2-tailed)		1	1		0.017	0.009	0.827	0.304
STCH1	Pearson Correlation		0.087	-0.067	-0.176	1	-.881**	-.331**	-0.035
	Sig. (2-tailed)		0.245	0.37	0.017		0	0	0.637
STCH2	Pearson Correlation		-0.08	0.004	.192**	-.881**	1	-0.155	0.004
	Sig. (2-tailed)		0.283	0.953	0.009	0		0.037	0.956
STCH3	Pearson Correlation		-0.021	0.131	-0.016	-.331**	-0.155	1	0.065
	Sig. (2-tailed)		0.775	0.079	0.827	0	0.037		0.38
PAST	Pearson Correlation		-0.144	-0.016	0.077	-0.035	0.004	0.065	1
	Sig. (2-tailed)		0.052	0.826	0.304	0.637	0.956	0.38	
**. Correlation is significant at the 0.01 level (2-tailed).									

Table 4: Summary of Multiple Regression Model

Model Summary[b]				
Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.667[a]	0.445	0.426	0.75746176
a. Predictors: (Constant), PAST, STCH2, EASES, USEFS, INCHS, STCH3				
b. Dependent Variable: INTUS				

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Limitations, Findings, and Implications

Some limitations exist in this study. Since the sample in this study is limited to undergraduate students from single faculty and single university, the research needs to be later replicated to examine the generalizability of findings. Nevertheless, some interesting results which instructors can apply to promote Edmodo usage are summarized. This study strongly supports perceived usefulness and perceived ease of use of the TAM model. Perceived usefulness is the most important variable that impacts Edmodo adoption and usage. Many students support usefulness of Edmodo as follows: "Edmodo is a good system, has many features." [Respondent 5, Respondent 59, Respondent 81] "Edmodo enables teachers to directly communicate with students and to give assignments." [Respondent 10, Respondent 100, Respondent 101, Respondent 102, Respondent 122, Respondent 140] "Edmodo can directly upload or submit files." [Respondent 21, Respondent 48, Respondent 95, Respondent 96, Respondent 148, Respondent 154, Respondent 155] "Edmodo has a system which enables assigning homeworks, grading, giving information, and updating news." [Respondent 27] "Edmodo is beneficial since it creates communication networks between students or teachers and students." [Respondent 30, Respondent 145] "Edmodo has more privacy." [Respondent 32, Respondent 38, Respondent 50, Respondent 120, Respondent 181] "Instructors can easily check finished assignments and users have more privacy than using Facebook" [Respondent 41] "Edmodo is good in terms of its grading feature." [Respondent 64, Respondent 89, Respondent 95, Respondent 96, Respondent 115, Respondent 122, Respondent 140, Respondent 148, Respondent 153, Respondent 161, Respondent 166] "Edmodo enables me to submit homework and notifies the assignments' deadline to me" [Respondent 69, Respondent 154, Respondent 155, Respondent 156, Respondent 166] "Edmodo makes me contact teachers easily and quickly get their responses back." [Respondent 78] "Edmodo is more suitable for education." [Respondent 88, Respondent 104, Respondent 127, Respondent 128, Respondent 153, Respondent 157, Respondent 167, Respondent 175] "Edmodo makes students more active to check new information and to complete turn-in assignments." [Respondent 149]

Table 5: Result of Multiple Regression Model and Variance Inflation Factor Analysis

		Unstandardized Coefficients		Standardized Coefficients			95.0% Confidence Interval for B		Collinearity Statistics	
	Model	B	Std. Error	Beta	T	Sig.	Lower Bound	Upper Bound	Tolerance	VIF
1	(Constant)	0.007	0.095		0.079	0.937	-0.18	0.195		
	USEFS*	0.593	0.057	0.593	10.388	0	0.481	0.706	0.972	1.029
	EASES*	0.241	0.057	0.241	4.24	0	0.129	0.353	0.982	1.019
	INCHS*	0.164	0.058	0.164	2.855	0.005	0.051	0.278	0.956	1.046
	STCH2	0.12	0.128	0.055	0.936	0.35	-0.133	0.372	0.932	1.073
	STCH3	-0.031	0.252	-0.007	-0.123	0.902	-0.529	0.467	0.954	1.049
	PAST	-0.002	0.003	-0.036	-0.627	0.531	-0.007	0.004	0.969	1.032

Coefficients[a]

a. Dependent Variable: INTUS

*p<0.01

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Perceived ease of use is the second factor which causes acceptance of Edmodo. Some students give opinions about Edmodo's ease of use as follows: "Edmodo is easy and it offers more convenience to submit assignments" [Respondent 6, Respondent 9, Respondent 120, Respondent 126] "Edmodo is easily understood and has more convenience features" [Respondent 23, Respondent 24, Respondent 148] "Using Edmodo is more convenience than Facebook" [Respondent 32] "Edmodo is convenient to use" [Respondent 44] "Edmodo is easy to use" [Respondent 60, Respondent 62, Respondent 64, Respondent 162] "Edmodo system is fast and convenient" [Respondent 72] Instructor characteristics are the third crucial factor affecting Edmodo's acceptance as a classroom collaboration tool. An instructor is a key person to make Edmodo's adoption succeed. Important characteristics of educators are encouraging students to participate, expressing his/her cares to students, focusing on teaching, and boosting group activities. Instructors should set the specific goals for learners too (Hineman and Norris, 2011). Moreover, he/she can build perceived usefulness by pointing out various benefits of Edmodo as described above, and can bring more perceived ease of use of Edmodo into view by training students who are unfamiliar with Edmodo. This is supported by Brady et al. (2010) that emphasize the need for training and support for the use of SNSs in educational settings for both instructors and students. More advantages of Edmodo that teachers can emphasize are using technologies in education can help students to prepare for their future jobs; students will have flexible work hours inside and outside the classroom; students will have chance to reach most updated information with Edmodo both from instructors and other peers; working in groups with Edmodo in a cooperative way will help students to share their experiences and ideas; students will be more social and communicative because of the group work; students will have chance to produce content and to manipulate the content which supports their self-efficacy (Elmas and Geban, 2012).

Two variables were not statistical significance: student characteristics and past behaviour. Collaborative and independent characteristics of learners are not supported since created activities in Edmodo were not customized for these particular groups. This also conforms to prior studies of Neuhauser (2002), Hunt et al. (2002), and Thongmak (2011). Past behaviour is rejected due to the variety and instability of those activities (Ouellette and Wood, 1998). In addition, suggestions about Edmodo for learning and teaching from students can be summarized in x vital views. First, teachers should utilize more features and create more activities to build online environments. Students described that "Edmodo is a good system, but sometimes not all features were utilized in the classroom" [Respondent 4] "Edmodo should be used for other purposes than for providing information e.g. sharing teaching clips" [Respondent 92] "Instructors should create more activities than turn-in assignments or alerts" [Respondent 117]. Second, Edmodo should improve some features or its performance. Students described that "Edmodo should response faster. The site has very slow response for turning in assignments, viewing groups, posting comments, etc." [Respondent 76] "Some texts in Edmodo cannot be copied, so it is difficult to use them in other purposes" [Respondent 142]. Third, Edmodo should have similar features as other social networks, such as Facebook, which students are familiar with. Students described that "Edmodo assignments should be notified through Facebook notifications too" [Respondent 12, Respondent 22] "Edmodo and Facebook should be linked together" [Respondent 134] "Other social network sites such as Facebook or Twitter should be applied together with Edmodo." [Respondent 57, Respondent 67] "Special interest groups should be set up for the benefit of people who are interested in those fields" [Respondent 15] "Edmodo should have features such as group creation, application development, etc." [Respondent 118] "I wish Edmodo has features to add friends because sometimes I want to privately chat with friends or instructor" [Respondent 58, Respondent 83] "Edmodo should notify

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events more clearly, like Facebook does" [Respondent 75]. Last, students expect Edmodo to have more users. They described that "Marketing strategies should be applied to encourage more Edmodo users." [Respondent 94] "Assignments should be added more to engage more people to use" [Respondent 98].

Conclusion

Web 2.0, especially social networks, can be more beneficial for other areas such as education than entertainment only. It can be used to support both distance teaching and to fulfil physical classroom learning. Applications of social networks in education generate a wide range of benefits such as new collaboration styles, enhancing modern classroom experiences, resource sharing in various formats, etc. So, this paper aims to study vital drivers for social networks' adoption. Edmodo is chosen because it is less known and less used even though it provides more secure and easy platform than a popular social network, Facebook. Technology acceptance model along with instructor factor and student factors are gathered to check their importance. Quantitative questionnaires were applied to reveal the results. The results show that instructors should emphasize the benefits of using Edmodo, educate students how to use some unfamiliar Edmodo's features, encourage online collaboration environments, and treat students with care. Edmodo's developers should also improve the tool's features to compete with other general purpose social networks. For further research, the acceptance of different educational social networks or within other environments should be study to generalize the results. Action research should also be applied to study online activities suiting for different groups of learners.

References

Andersson, A. and Grönlund, A. (2009), 'A Conceptual Framework for E-Learning in Developing Countries: A Critical Review of Research Challenges,' *The Electronic Journal of Information Systems in Developing Countries* 38(8), 1-16.

Behnke, S., LaPrairie, K., and Maninger, R. (2012), 'Recipe for Success: Leveraging Student and Instructor Perceptions of Online Graduate Courses in Course Design,' *Focus on Colleges, Universities, and Schools* 6(1), 1-9.

Bhuasiri, W., Xaymoungkhoun, O., Zo, H., Rho, J. J., and Ciganek, A. P. (2012), 'Critical success factors for e-learning in developing countries: A comparative analysis between ICT experts and faculty,' *Computers and Education* 58, 843–855.

Brady, K. P., Holcomb, L. B., and Smith, B. V. (2010), 'The Use of Alternative Social Networking Sites in Higher Educational Settings: A Case Study of the E-Learning Benefits of Ning in Education,' *Journal of Interactive Online Learning* 9(2).

Charkins, R. J., O'Toole, D. M., and Wetzel, J. N. (1985), 'Linking Teacher and Student Learning Styles with Student Achievement and Attitudes,' *The Journal of Economic Education* 16(2), 111-120.

Cheung, C. M. K., Chiu, P. Y., and Lee, M. K. O. (2010), 'Online social networks: Why do students use Facebook?,' *Computers in Human Behaviour* 27(4), 1337–1343.

Conner, M. and Armitage, C. J. (1998), 'Extending the Theory of Planned Behaviour: A Review and Avenues for Further Research,' *Journal of Applied Social Psychology* 28(15), 1429-1464.

Cooper, E. K. (2009), Facilitating Student Interaction with Online Discussion Groups, Online Cl@ssroom: Ideas for Effective Instruction - Special report: Student collaboration in the online classroom.

Davis, F. D. (1989), 'Perceived usefulness, perceived ease of use, and user acceptance of information technology,' *MIS Quarterly* 13, 319-339

Diaz, D. P. and Cartnal, R. B. (1999), 'Students' learning styles in two classes:

_____

_____

Online distance learning and equivalent on-campus,' *College Teaching* 47(4), 130-135.

Diaz, D. P. (2000), Comparison of student characteristics, and evaluation of student success, in an online health education course, Doctoral dissertation, Nova Southeastern University, Fort Lauderdale, Florida.

Duncan, J. C. and Chandler, P. D. (2011), 'A Community of Practice for Early Career Biology Teachers: Social Networking and Digital Technologies,' Proceedings of Contemporary Approaches to Research in Mathematics, Science, Health and Environmental Education, Deakin University, Melbourne Burwood Campus.

Eagly, A. H. and Chaiken, S. (1993), The Psychology of Attitudes, Harcourt Brace Jovanovich, Orlando, FL.

Elmas, R. and Geban, Ö. (2012), 'Web 2.0 Tools for 21st Century Teachers,' *International Online Journal of Educational Sciences* 4(1), 243-254.

Fazio, R. H. and Zanna, M. (1978), 'Attitudinal qualities relating to the strength of the attitude behaviour relationship,' *Journal of Experimental Social Psychology* 14(4), 398–408.

Forte, A., Humphreys, M., and Park, T. (2012), 'Grassroots Professional Development: How Teachers Use Twitter,' Proceedings of the 6th International AAAI Conference on Weblogs and Social Media, Dublin, Ireland.

Galán, J. G. (2011), 'New Perspectives on Integrating Social Networking and Internet Communications in the Curriculum,' eLearning Papers. www.elearningpapers.eu. ISSN: 1887-1542.

Griffith, S. and Liyanage, L. (2008), 'An introduction to the potential of social networking sites in education,' Proceedings of Emerging Technologies Conference (ETC08), Wollongong, Australia.

Gururajan, R. and Gururajan, V. (2008), 'Clinical Factors and Technological Barriers as Determinants for the Intention to Use Wireless Handheld Technology in Healthcare Environment: An Indian Case Study,' Proceedings of European Conference on Information Systems. Paper 216.

Halm, J., Tullier, C., D'Mello, A., Bartels, R., Wittman, A., Lamboley, D., Smith, T., Hartless, R. N., Lay, M., Gockenbach, J., Bucholtz, B., and Nichols, L. (2012), Use of Social Networking Tools in Unit 5. SNT White Paper. Unit 5 Citizens Advisory Counsel.

Hamid, S., Chang, S., and Kurnia, S. (2009), 'Identifying the use of online social networking in higher education,' Proceedings ascilite Auckland 2009: Poster: Hamid, Chang and Kurnia, 419-422.

Haefner, J. M. and Hanor, J. (2012), 'iPads Apps for Utility and Learning,' Proceedings of the 28 th Annual Conference on Distance Teaching and Learning, 1-5.

Hativa, N. and Birenbaum, M. (2000), 'Who Prefers What? Disciplinary Differences in Students' Preferred Approaches to Teaching and Learning Styles,' *Research in Higher Education* 41(2), 209-236.

Hineman, J. and Norris, J. (2011), 'Friending Facebook, Timely Tweets: Using Web 2.0 in Economics Education,' Proceedings of the Pennsylvania Economic Association 2011 Conference, 133-142.

Holland, C. and Muilenburg, L. (2011), 'Supporting Student Collaboration: Edmodo in the Classroom,' Proceedings of Society for Information Technology and Teacher Education International Conference 2011, Chesapeake, VA, 3232-3236.

Hunt, L.M., Thomas, M. J. W., and Eagle, L. (2002), 'Student resistance to ICT in education,' Proceedings International Conference on Computers in Education, December 306, Auckland, NZ, 964-968.

Koçak-Usluel, Y., Mazman, S. G. (2009), 'Adoption of Web 2.0 tools in distance education,' *International Journal of Human Sciences* 6(2), 90-98.

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_____

Mirabolghasemi, M. and Huspi, S. H. (2012), 'A Blended Community of Inquiry Approach: The Usage of Social Network as a Support for Course Management System,' Proceedings of International Conference on Computer & Information Science (ICCIS), 180 – 183.

Lim, J. (2002), 'A conceptual framework on the adoption of negotiation support systems,' *Information and Software Technology* 45(8), 469-477.

Campos, A. and Garaizar, P. (2010), 'LMS and Web 2.0 Tools for e-Learning: University of Deusto´s Experience Taking Advantage of Both,' Proceedings of IEEE EDUCON Education Engineering 2010 - The Future of Global Learning Engineering Education, Madrid SPAIN, 1751-1757.

Mack, D., Behler, A., Roberts, B., and Rimland E. (2007), 'Reaching Students with Facebook: Data and Best Practices,' *Electronic Journal of Academic and Special Librarianship*, 8(2).

Mazer, J. P., Murphy, R. E., and Simonds, C. J. (2007), 'I'll See You On "Facebook": The Effects of Computer-Mediated Teacher Self-Disclosure on Student Motivation, Affective Learning, and Classroom Climate,' *Communication Education* 56(1), 1-17.

Mazman, S. G. and Koçak-Usluel, Y. (2009), 'The Usage of Social Networks in Educational Context,' Proceedings of World Academy of Science, Engineering and Technology 49 , 404-407.

Mazman, S. G. and Koçak-Usluel, Y. (2010), 'Modeling educational usage of Facebook,' *Journal Computers & Education* 55(2), 444-453.

Neuhauser, C. (2002), 'Learning Style and Effectiveness of Online and Face-to-Face Instruction,' *American Journal of Distance Education* 16(2), 99-113.

Newman, M. E. J. and Park, J. (2003), 'Why social networks are different from other types of networks,' *Physical Review E*, 68(3).

O'Brien, R. M. (2007), 'A Caution Regarding Rules of Thumb for Variance Inflation Factors,' *Quality and Quantity* 41(5), 673-690.

Ollis, J. C. (2011), Web 2.0 at A Non-Traditional Charter School A Mixed Methods Study. A Thesis, Master of Science, the Florida State University College of Education.

Ouellette, J.A. and Wood, W. (1998), 'Habit and intention in everyday life: The multiple processes by which past behaviour predicts future behaviour,' *Psychological Bulletin* 124, 54-74.

Pagram, P. and Pagram, J. (2006), 'Issues in E-learning: A Thai Case Study,' *The Electronic Journal on Information Systems in Developing Countries* 26(6), 1-8.

Potter, J. (2006), Technology and education, in Sharp, J. et al. (Eds) Education Studies: an Issues-Based Approach. Leaning Matters, Exeter.

Regan, D. T. and Fazio, M. (1977), 'On the consistency between attitudes and behaviour: look to the method of attitude formation,' *Journal of Experimental Social Psychology* 13(1), 28–45.

Roblyer, M. D., McDaniel, M., Webb, M., Herman, J., and Vince, J. (2010), 'Findings on Facebook in higher education: A comparison of college faculty and student uses and perceptions of social networking sites,' *Internet and Higher Education* 13(3), 134–140.

Selim, H. M. (2007), 'Critical success factors for e-learning acceptance: Confirmatory factor models,' *Journal Computers & Education* 49(2).

Siritarungsri, B. and Suwansumrit, C. (2011), 'Evaluation of the Use of Webcasting to Support Nursing Learning,' *Journal of Nursing Science* 29(3), 36-42.

Siritongthaworn, S. and Krairit, D. (2004), 'Use of Interactions in E-learning: A Study of Undergraduate Courses in Thailand,'

_____

_____

International Journal of the Computer, the Internet and Management 12, 162-170.

Siritongthaworn, S., Krairit, D., Dimmitt, · N. J., and Paul, H. (2006), 'The study of e-learning technology implementation: A preliminary investigation of universities in Thailand,' *Education and Information Technologies* 11(2), 137–160.

Sledgianowski, D. and Kulviwat, S. (2008), 'Social Network Sites: Antecedents of User Adoption and Usage,' Proceedings of the Americas Conference on Information Systems (AMCIS2008), Toronto, Canada.

Swan, K. (2002), 'Building learning communities in online courses: The importance of interaction,' *Education, Communication, and Information*, 2(1), 23-49.

Thongmak, M. (2011), 'Facebook © Adoption as Computer-Mediated Communication for University Students,' Proceedings of Americas Conference on Information Systems (AMCIS2011), Detroit, USA.

Towner, T., VanHorn, A., and Parker, S. (2007), 'Facebook: Classroom Tool for a Classroom Community?' Proceedings of Midwestern Political Science Association.

Visagie, S. & de Villiers, C. (2010), 'The consideration of Facebook as an academic tool by ICT lecturers across five countries,' Proceedings of the SACLA conference (SACLA2010), June 7-9, University of Pretoria, South Arfica.

Venkatesh, V. and Bala, H. (2008), 'Technology Acceptance Model 3 and a Research Agenda on Interventions,' *Decision Sciences* 39, 273-315.

Volery, T. and Lord, D. (2000), 'Critical success factors in online education,' *The International Journal of Educational Management* 14(5), 216–223.

Ng, W. (2012), 'Can we teach digital natives digital literacy?' *Computers and Education* 59, 1065–1078.

Yang, H. L. and Tang, J. H. (2003), 'Effects of social network on student's performance: a web-based forum study in Taiwan,' *Journal of Asynchronous Learning Networks* 7(3), 93-107.

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