

A Study on Windows Live Social Network Integrated into Information Instruction in Elementary Schools

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ABSTRACT. *Along with the development of information technology, innovative digital learning is an inevitable trend of future education. Taiwan has been continuously renovating and refining its education system so that students can obtain quality education and achieve effective learning in knowledge, skills, and attitudes. The purposes of this research are twofold: first, this study aims to create a reliable and valid questionnaire for “The Learning Performance of Windows Live Social Network Integrated into Information Instruction in Elementary Schools” through literature review, expert meetings, item analyses, and factor analyses; second, adopting the research method of “experiment group vs. control group,” this study explores the performance of using Windows Live social network as a supplementary teaching platform for students in IT courses. The subjects are four classes of 6th-grade students in one elementary school in Taiwan, among them, two classes were the experiment group, while the other two, the control group. This study also investigates how differences on amount of time spent online and number of times*

responding to articles affect students' achievements in IT course with different learning methods.

Keywords: *social network, learning performance, Windows Live*

1. Introduction

Recent technological, cultural, and economic developments have generated entrepreneurial interest in the development of technological solutions to tackle educational problems (Veletsianos et al., 2013). Under these circumstances, and along with the development of information technology, innovative digital learning is an inevitable trend of future education. Taiwan has been continuously renovating and refining its education system so that students can obtain quality education and achieve effective learning in knowledge, skills, and attitudes. However, learning styles are changing following the development of digital technology and the availability of broadband network. As network applications become more diverse and accessible, users are more willing to learn and share knowledge through the internet. Among the current internet services, Social Networking Service is the most popular. The more recent social networking media that are rapidly gaining popularity are Blog, Facebook, Plurk, Twitter, Windows Live, Google+, etc.

In Taiwan, elementary schools are part of liberal education, so teachers are responsible for the instruction of the entire class. They often lack the time or ability to create their own internet teaching materials even if they intend to use internet technology as a supplementary platform. So they tend to return to traditional classroom teaching methods, or use the information materials developed by other teachers. This study is therefore motivated to investigate the learning performance of integrating social network into information instruction in elementary schools. The discussions focus on two aspects: 1. whether students' learning achievements of IT course vary because of different learning styles; 2. the relation between students' learning achievements in IT course and their time spent on the Windows Live blog and the number of times they respond to the teacher's articles.

2. Literature Review

2.1 Studies on the application of social network integrated into education

Based on the advancement of information and communication technology, teaching technology in Taiwan can be divided into the following periods: electronic education (1935-1953), audio-visual education (1953-1970), audio-visual communication (1970-1985), teaching technology (1986-1993), and e-Learning (1994-) (Ho, 2012). Students' learning methods have gradually evolved from traditional classroom learning to web-based digital learning. Roschelle et al. (2000) found that students can enhance learning performance by using information and communication technology, and the main reasons include (1) active participation, (2) participating in groups, (3) regular communication and feedback, and (4) maintaining contact with the real world.

"Social network" is a two-way medium. Users can construct dialogues with other users

through the network and to strengthen their mutual relation (Smith, 2010). Social networks are web-based service, which provide pages for users to construct public or semi-public files. In addition to users' names and pictures, the files also display lists of friend users and their participating groups. These groups are not necessarily formed by acquaintances in the real world, but can be created based on common interests of the members. These members share information through text, pictures, video, and network links, and exchange personal information such as names, jobs, spending habits, etc. (Mix, 2011). Therefore, as also pointed out in Veletsianos et al. (2013), researchers and people in IT industry all suggest that applying social network in regular curriculum is a worthwhile direction. In order to achieve this purpose, the emerging learning platforms now include social networking features. Social network is not only a virtual platform for interaction, information exchange and discussion, but also a mode of collective creation and an active participation of social activities (Gurau, 2008). For example, during the communication breakdown caused by the earthquake and tsunami of March 11, 2011 in Japan, micro-blogs and Facebook became the major channels of communication.

Furthermore, social network is also applied in education. Teachers can provide their own material or refer to the information from good websites as an extension and reinforcement of the course for students through school system or other systems such as Google Blogger and Facebook. Surveys of undergraduate students in the United States showed that over 90 % of them use Facebook (Veletsianos et al., 2013). Besides, research on social networks offers a ripe arena to explore how youth work, play, and learn in these online environments (Ahn, 2011).

2.2 Windows Live Social Network

Although social networks can be applied in education, the concern of privacy leaking causes users reluctant to use them. Solove (2008) pointed out that any personal information posted on Facebook or any social network may become one's potential burden in the future. Users of the most popular networks like Facebook are especially worried that their personal information may be used illegally. Liu (2012) found that the Beacon in 2007 automatically "broadcast" your consumption behavior and network activities on external websites to your friends on the Facebook. In other words, Facebook gave out your locations and behaviors to other users. Facebook finally shut down Beacon in 2009 after users filed a class action lawsuit. Nissenbaum (2009) also considered those who frequently upload content or disclose information to social networks like Facebook are taking risks with their privacy. Hoadley et al. (2010) stated that users have lost control of their privacy on Facebook, and consequently, users must be very careful in using Facebook.

Based on the concern of students' personal privacy in social networks, and to educate students about information ethics, this study thus uses Windows Live as the research field. Windows Live, a product of Microsoft, is an excellent platform. It integrates functions of e-mail, instant messaging,

web sharing, photo management, multimedia application, and social networking, and with the assistance of software, it has become a platform with software and network services, as shown in the following Figure 1.

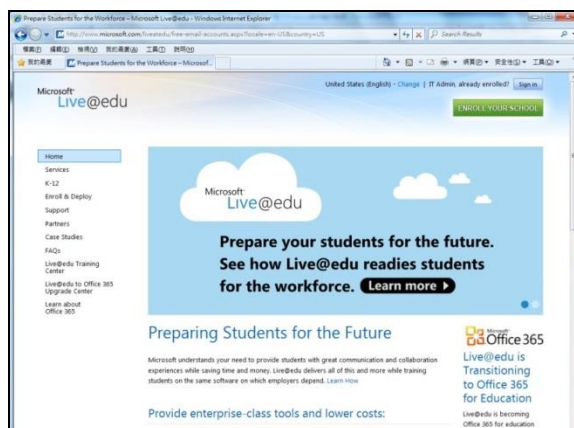


Figure 1. Windows Live provides collaborative teaching platform
(Source: Microsoft Corporation, 2012)

Windows Live started from 2003: Microsoft invested \$250 million to initiate a five-year project “Partners in Learning” (PIL) in 70 countries around the world, and “School of the Future” is one of the project items. Taiwan is one of Microsoft’s future schools. This project caused enthusiastic responses all over Taiwan, especially the trend of “learning anywhere and anytime,” which applies digital technology such as tablet PCs, wireless networks, interactive whiteboards, and projectors in teaching, and creates a mobile classroom. Microsoft Taiwan Corporation has been cooperating with Taiwan’s national teachers’ information network (Inservice) and, through the concept of cloud computing, providing teachers with online digital resources in order to strengthen the professional knowledge of integrating information into instruction (Microsoft Corporation, 2012).

Further, Windows Live presents each subscribed message, news, latest article posted by friends, interaction among friends, etc. with web pages or Window Live Messenger software. The arrangement is orderly and clear at a glance (Thelwall, 2008). Since Windows Live services is free application software, students can use these services as tools for learning. Moreover, since the only cost is the charge of network, it can be widely used in teaching. In particular, Windows Live is better than other instant messaging software (such as Yahoo! Messenger and Google Talk) in that its community design is more convenient and complete, and its blog-format web space is easy to use, so students need not learn professional web page design techniques. This would consume less network bandwidth, so the network load would be less heavy for elementary and junior high schools in general. Thus, teachers can be more flexible in teaching.

2.3 The influence of social network on learning experience, learning interest, and learning anxiety

Learners in social network need to take the role of teachers; they are given the rights and responsibilities of instruction among peers, and they must create opportunities for learners to share and learn from experience (Hanna et al., 2000). Hsu et al. (2011) believed that the rise of social networks strengthens users' concept of behavior and experience, especially in absorbing others' experience and sharing their own thoughts, which are helpful for learning. Arena and Conein (2008) pointed out that social network members share and spread personal experience, knowledge and digitalized files through interactions, and they also produce and consume collaboration results and community experience.

Related research showed that social network users participate in the interaction of virtual communities based on their interest (Daud, 2012). Social networks not only allow collaboration among users, but also inspire collective cooperation and production; users of common interest gather together and collaborate to develop specific work (Fan, 2011). Therefore, given social networks' features of immediacy and sharing, messages can be quickly spread to students and teachers of the same interest, which makes social networks another way of self-marketing. This kind of interest-based social networks may communicate through many ways, such as e-mails, message boards, forums, instant messaging, and blogs. Furthermore, social networks are online network, where people of common interest, goals, or experience can interact, share knowledge and information, and create socially interactive relations.

Solove (2008) further pointed out that when users are aware that they are being watched, they feel anxious and insecure, causing self-censoring and self-restraint. Matzler et al. (2008) also believed that members that tend to feel nervous, anxious, inferior or vulnerable to others' criticism may have negative performance on knowledge sharing in the social network. Pierce (2009) also found that anxiety, depression and overall uncomfortable feeling will affect a person's ability, and the anxieties of social interaction will to some extent affect learning performance.

3. Research Method

3.1 Design and hypotheses

This study mainly explores whether students' learning achievements in IT courses will vary because of different learning styles (community learning vs. traditional learning), and investigates the learning performance of integrating Windows Live into the instruction of IT courses. This study adopts the design of quasi-experimental method of "experimental group vs. control group" and conducts a nine-week experimental instruction. Having consulted other relevant literature, this study constructs a research framework as in Figure 2.

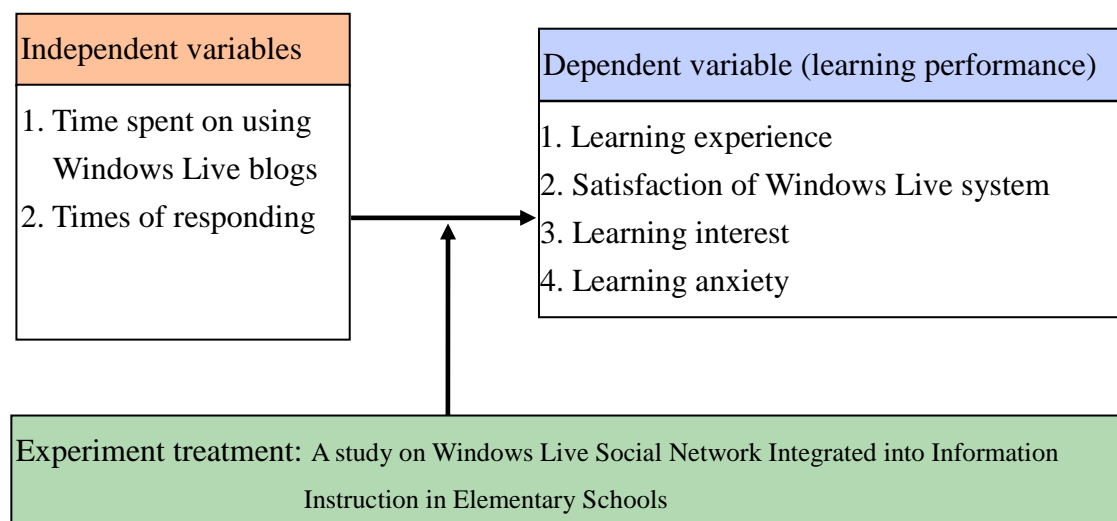


Figure 2. Research framework

Based on the above literature review, research framework and research purpose, this study proposes and tests the following three null hypotheses:

1. With different learning methods, all students of experimental group and control group show significant differences in their learning achievements in IT courses.
2. The amount of time spending on Windows Live causes significant differences in experimental group students' learning achievements in IT courses.
3. The number of responding times results in significant differences in experimental group students' learning achievements in IT courses.

In addition, this study also investigates the current learning performance of integrating Windows Live social network into IT courses in order to understand how well it is accepted among students.

3.2 Subjects

The subjects of this study are four classes of 6th graders in one elementary school in Taiwan; two of the classes, with total 61 students (30 male and 31 female), are the experimental group, who use Windows Live social network as part of their learning methods. The other classes are the control group, with 63 students (34 male and 29 female), who are taught with the traditional teaching methods.

3.3 Questionnaire

The questionnaire on "Learning performance of Windows Live Social Network Integrated into

Information Instruction in Elementary Schools” is made based on the review of past literature and also takes into consideration of students’ comprehension of questionnaires. The 5-point Likert scale is adopted in the questionnaire; the subjects can choose from 5 (strongly agree) to 1 (strongly disagree). A total of 28 items were developed, analyzed, and arranged for the first version of the questionnaire. Five experts in social network were asked to review the content of each item in terms of its appropriateness. Based on the experts’ reviews, 4 items were deleted, 2 items were revised, and the other items were modified of the wordings. The final questionnaire contains 24 items that are approved by expert validity test.

The questionnaire was approved by expert content validity test to ensure that the test content represents the behavioral level to be measured (Guo, 2001). 30 students who had used Windows Live were drawn by purposive sampling to conduct the pretest, the result of which was used to analyze items to determine the questionnaire content. Finally, four dimensions were obtained through factor analyses, which, according to the variables of the research framework, were named as “learning experience,” “satisfaction of Windows Live system,” “learning interest,” and “learning anxiety.” These 24 items were then confirmed as the final valid content of the questionnaire.

To understand the reliability and validity of the questionnaire, the researcher conducted a reliability analysis by using “Cronbach’s α .” The reliability of each subcategory is as follows: “learning experience” is 0.825, “satisfaction of Windows Live system” is 0.830, “learning interest” is 0.806, and “learning anxiety” is 0.860. The reliability of the whole questionnaire is 0.889, which exceeds the acceptable value of 0.70 (Nunnally, 1978).

3.4 Experimental instruction

(1) Experimental group students applying for Windows Live accounts

In the first week of the semester, experimental group students are asked to apply for an individual Windows Live account during IT class by their student number and friend the teacher’s Windows Live account. When all the students apply, they form a small community of learning network.

(2) Stages of experimental instruction:

1. The experimental group:

Experimental group takes nine weeks of experimental teaching. When teaching the courses, the teacher not only explains the content, but also shows each student’s work through Windows Live, so students can appreciate and observe their work in each class period. They can also describe and analyze the work they like during or after class. In so doing, the students can learn from others’ creative ideas and broaden their minds. Moreover, low-achieving students can improve their capabilities from observing these works, much better than from the teacher’s instruction. Figure 3-1 and 3-2 show the learning of the experimental group. In addition, students can respond, share their

thoughts again, or share their work with the others during or after class.



Figure 3.1. Math practice question



Figure 3.2. Group discussion

2. The control group:

The control group is taught with traditional teaching method. In each class, the researcher only explains the operation procedures and the key points, and reminds the students of relevant matters. These students cannot observe others' works, nor can they have discussions with their classmates through the network. Control group students can observe others' works only when the teacher displays some outstanding works in the next class. But with the limited time, not many works can be shown or explained.

4. Results and discussions

4.1. Influence of different learning methods on learning achievement test in IT courses between experimental group and control group

As shown in Table 1, the learning achievement test of the experimental group mean is 86.03 (full score is 100 points), higher than that of the control group, which is 79.57. The result shows that students instructed with Windows Live blog teaching method achieve higher than those instructed with traditional teaching method, and there is less difference among the experimental group students' scores.

Table 1. Mean of experimental group and the control group

Group	N	Mean	SD	Std. Error Mean
Experimental	61	86.03	6.37	1.35
Control	63	79.57	10.72	0.82

In Table 2, the independent samples test of experimental group and control group in IT course

indicates that the significance of F value is $.000 < 0.05$, and the significance of t-test with the same mean reaches $p = .000 < 0.001$. Therefore, the assumption that the two samples have unequal variance is abandoned.

Table 2. Independent samples test

Confidence	Levene's test with equal variance		t-test for equality of means		
	F	$Sig.$	t	df	$Sig.$ (two-tailed)
Equal variances not assumed	21.121	.000	-4.064***	122	.000

Note. *** $p < .001$

4.2. Influence of amount of time using Windows Live on experimental group students' learning performance in IT courses

The results of Table 3 indicate that students who spend more time on Windows Live achieve higher average scores than those who spend less time. The ANOVA analysis results also show the significance of F value $p = .001$, revealing that the amount of time using Windows Live makes significant differences on students' learning performance in IT courses.

Table 3. Students' on-line hours and scores

Hours spent on using WL per week	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval Mean		Min.	Max.
					Lower Bound	Upper Bound		
0-1 hour	16	81.44	6.99	1.75	77.72	85.16	68.8	93.2
1-2 hours	22	86.71	5.90	1.26	84.10	89.32	72.2	96.2
More than 2 hours	23	88.58	4.66	.97	86.57	90.60	80.2	96.8

In Table 4, the significance of ANOVA variance analysis between the amount of time using Windows Live and students' scores reaches $.001 < 0.05$. The result indicates that we should abandon the null hypothesis; in other words, the amount of time students use Windows Live does cause significant difference on their learning achievements in IT courses.

Table 4. ANOVA variance analysis on the time using WL

	df	F	Sig.
Between groups	2	7.435**	.001
Within the group	58		
Total	60		

Note. ** $p < .01$

4.3. Influence of number of response times on experimental group students' learning performance in IT courses

As indicated by the results of Table 5, students who respond more often to Windows Live social network have averagely higher scores than those who respond less, and the difference of students' scores is more concentrated. Furthermore, as revealed by the result of ANOVA variance analysis, the significance of F value is $p = .001$. Therefore, number of times responding to Windows Live social network causes significance difference on students' learning achievements in IT courses.

Table 5. Students' response times and scores

Times	Mean	Numbers	SD
2	79.73	9	7.17
3	82.31	7	5.90
4	86.51	19	5.65
5	86.65	13	4.43
6	89.30	7	4.56
7	92.87	3	3.80
8	93.40	3	2.20

Table 6 shows the ANOVA variance analysis on students' response times with score differences. The significance reaches $.001 < 0.05$, which means that the null hypothesis should be abandoned. In other words, number of times responding to Windows Live social network causes significant differences on students' learning achievements in IT courses.

Table 6. ANOVA variance analysis on number of response times

		df	F	Sig.
Score * Times	Between groups	6	4.748**	.001
	Within the group	54		
	Total	60		

Note. ** $p < .01$

4.4. Details for learning achievement of experimental group students

In order to investigate the learning performance of Windows Live social network integrated into IT course instruction, this study adopts quasi-experimental method's "experimental group vs. control group" and conducts nine weeks of experimental teaching. The "Learning performance of Windows Live Social Network Integrated into Information Instruction in Elementary Schools" questionnaire is administered after the teaching in order to understand the students' opinions on the four dimensions.

4.4.1. Learning experience

There are 6 questions in the dimension of "learning experience" (as listed in Table 7). For Q1 as many as 70.7% of the students agree or strongly agree; in contrast, 37.9% of the students disagree or strongly disagree with Q6.

Table 7. Learning experience of experimental group students (percent)

Item no.	Question	Strongly agree	Agree	No comment	Disagree	Strongly disagree
Q1	I like IT class very much.	44.8	25.9	27.6	0	1.7
Q2	I think I am rather good at IT.	36.2	22.4	32.8	5.2	3.4
Q3	I often search information on the Internet.	43.1	24.1	27.6	5.2	0
Q4	I often share my thoughts on the Internet.	32.8	10.3	36.2	19.0	1.7
Q5	I often browse certain blogs regularly.	34.5	13.8	17.2	19.0	15.5
Q6	I have my own blog.	31.0	17.2	13.8	13.8	24.1

4.4.2. Satisfaction of Windows Live system

There are 6 questions on "satisfaction of Windows Live system" (as in Table 8). For Q1 as many as 63.8% of the students agree or strongly agree, while 15.5% of them disagree or strongly disagree with Q5.

Table 8. Satisfaction of Windows Live system of experimental group students (percent)

Item no.	Question	Strongly agree	Agree	No comment	Disagree	Strongly disagree
Q1	I learned how to register Windows Live ID very quickly.	39.7	24.1	27.6	5.2	3.4
Q2	I learned how to use Windows Live	34.5	19.0	37.9	5.2	3.4

	very quickly.					
Q3	I think Windows Live is easy to use.	31.0	24.1	32.8	6.9	5.2
Q4	I think Windows Live starts smoothly.	20.7	25.9	43.1	3.4	6.9
Q5	I can easily solve the problems I had in using Windows Live.	19.0	24.1	41.4	10.3	5.2
Q6	I think Windows Live has all the features I need.	25.8	32.8	31.0	5.2	5.2

4.4.3. Learning interest

There are 7 questions in the dimension of “learning interest” (as shown in Table 9). As many as 69.0% of the students agree or strongly agree about Q3. But 15.5% of the students disagree or strongly disagree about Q6.

Table 9. Learning interest among experimental group students (percent)

Item no.	Question	Strongly agree	Agree	No comment	Disagree	Strongly disagree
Q1	I think learning IT through Windows Live makes me like IT class better.	25.9	27.6	41.4	1.7	3.4
Q2	I think learning through Window Live makes me understand the course content better.	25.9	36.2	32.8	0	5.2
Q3	I think learning through Window Live enables students to discuss their work with each other.	34.5	34.5	22.4	5.2	3.4
Q4	I think learning through Window Live enables me to produce better work.	24.1	36.2	32.8	3.4	3.4
Q5	I would recommend Windows Live to my friends to study IT course.	34.5	19.0	37.9	5.2	3.4
Q6	I go to others' Windows Live sites to see their work after IT class.	20.7	20.7	43.1	8.6	6.9
Q7	I hope other subjects can also use this social network teaching method.	44.8	17.2	31.0	5.2	1.7

4.4.4. Learning anxiety

There are 5 questions in the dimension of “learning anxiety” (as listed in Table 10). For Q1 as many as 56.9% of the students express that they don't feel great stress; in contrast, there are also 51.8% of the students disagree or strongly disagree about Q4.

Table 10. Learning anxiety of experimental group students (percent)

Item no.	Question	Strongly agree	Agree	No comment	Disagree	Strongly disagree
Q1	I feel stressed when learning through Windows Live.	6.9	5.2	31.0	22.4	34.5
Q2	I am afraid I would do poorly when responding with Windows Live.	10.3	19.0	41.4	13.8	15.5
Q3	I worry that others may have bad evaluation on my work.	19.0	19.0	31.0	17.2	13.8
Q4	I feel afraid if we use Windows Live for learning in the next class.	5.2	1.7	41.4	32.8	19.0
Q5	I think Windows Live is too slow, so sometimes we have to wait a long time or cannot see the work.	8.6	17.2	41.4	13.8	19.0

4.5. Qualitative analysis: classroom observation and in-depth interview

This study also examines experimental group students' psychological awareness toward Windows Live social network integrated into IT instruction through classroom observation and after-class in-depth interviews. The results of observation and interviews are analyzed in four dimensions. In learning experience, the students are pleased with the new information technology; they are particularly intrigued by teacher's using Windows Live social network as a teaching tool in the class. They use Windows Live to discuss questions with their classmates at home. With blog features, they even set up their own forum to share learning experience and techniques in solving questions of IT class.

In satisfaction of Windows Live system, the students express that they feel Windows Live is easy to use, and the interface is very user-friendly. Users can get started quickly because they can understand functions of the buttons through icons without reading the operation manual. For beginners, Windows Live is a great social network site. In learning interest, students state they are especially pleased that they can discuss homework with their classmates through Windows Live. Most of them had thought Windows Live was like Facebook, with functions restricted to network communication, but later find out that Windows Live has more features. In particular the multi-media's audio and video effects make the course content colorful for learning, which is a pleasant surprise for them. The students hope that Windows Live can be used in other courses as well. In learning anxiety, the students mention that they don't feel stressful due to the interactive features of Windows Live. In addition to communication and audio/video functions which are common to other social network sites like Twitter, Facebook, and Google+, Windows Live offers the additional feature of interaction and collaborative learning among peers. As a result, the students are not anxious about learning, but instead, feel motivated to work harder to get recognition from the teacher and classmates.

4.6. Discussion

One of Taiwan's largest industries is the Information Technology field, and their growth in this sector began only 50 years ago. Taiwan had no IT to speak of, yet the country's leaders chose to promote the manufacture of IT products to fill the growing need worldwide. One reason for the success is education, especially IT education. Taiwan government encourages teachers to teach with various teaching material and tools to promote students' learning achievement and learning performance. This study therefore presents the research processes and results on Windows Live social network integrated into IT education of elementary school, so that the readers and experts in education field can understand better the current condition of Taiwan's IT education. As many scholars (e.g. Minocha et al., 2011; Selwyn and Grant 2009) asserted in their studies, applying emerging technique such as social network in teaching is helpful for education.

In this study, the subjects are divided into experimental and control groups. The tools used on the experimental group include instruction with Windows Live social network website and the questionnaire on "Learning performance of Windows Live Social Network Integrated into Information Instruction in Elementary Schools," which is to realize students' acceptability of Windows Live social network and the learning effectiveness of using Windows Live as a learning tool. On the other hand, the control group is taught with traditional method. Other than the different teaching methods and teaching tools, both groups are instructed by the same teacher and assessed with the same learning achievement test.

The research result reveals that the experimental group, which studies IT course with Windows Live social network, attains better scores in learning achievement test than the control group. This result is compatible with those of Greenhow (2011), and Othman et al. (2012) indicating that Windows Live social network is suitable as teachers' teaching tool and students' learning tool. Moreover, students' scores in learning achievement test are proportional to their weekly hours of using Windows Live and number of times responding to questions; in other words, the longer they use Windows Live each week or the more times they respond to questions, the better their learning achievement. As Cho et al. (2007) pointed out, in network learning, users' learning achievement improves along with the increase of time participating in learning or number of times responding to peers' questions.

This study also discovers through class observation and in-depth interviews that the students are pleased with the new teaching method and tool because they are novel and interesting. As Prensky (2001) pointed out, fun learning can achieve better learning effect than traditional learning. Further, the students express opinions more freely in the social network during the learning process by using Windows Live. This confirms the finding of Veletsianos et al. (2013). Likewise, the two studies of Greenhow (2011) stated that social network sites can serve as direct and indirect supports for learning, such as providing an emotional outlet for school-related stress, validation of creative work, peer-alumni support for school-life transitions, and help with school-related tasks. Cadima et al.

(2012) also asserted that social networks play an essential role in learning environments as a key channel for knowledge sharing and students' support. Besides, most scholars (Bieber et al., 2002) classify social networks into professional communities and virtual educational communities based on their functions. However, virtual educational communities emphasize more on the interactive environment, share a common consensus and enthusiasm in learning, and it is important that the members know and communicate with each other. Moreover, teachers and students can exchange and discuss ideas on this platform and construct a good learning environment. In addition, the platform can be used in other classes, or in future courses, which will be useful for teachers to re-prepare teaching materials. Students can use the platform to share their work with peers, and discuss and learn with each other, so all the members of the community can gain knowledge together, and the learning performance will be strengthened (Naghshineh and Zardary, 2011). This study presents all these abundant research results.

Some scholars (Minocha et al., 2011; Selwyn and Grant, 2009) believe that the application of social network and other emerging technology in education is still in the infancy stage; however, some educational researchers have turned their attention to research on how social network influences learning (Greenhow and Robelia, 2009). Given the aforementioned research results, using Windows Live social network as a teaching method and teaching tool can indeed enhance students' learning achievement and learning performance.

5. Conclusion and Suggestions

5.1 Conclusion

The rapid development of information and communication technology has affected all areas of human life, including education. It has brought about changes in the structure and implementation of education (Chen and She, 2012). Therefore, many educational institutions have begun to seek new models to meet the needs of students. In order to make learning more effective, it is essential to provide an environment that can improve learning interest and motivation, and one of the key elements of such environment is computer (Arslan, 2006). As a consequence, 'social network' came into being (Donmus, 2010). 'Facebook,' the social network created by a freshman nerd in Harvard's dormitory, not only changed the way of human communication, but also changed social behavior (Shiu, 2011). With the network getting more popular, the virtual space in the network has eliminated the physical space between people in the real world; interpersonal contact no longer requires face-to-face communication, but can be done through such emerging social networking. As long as a person owns a personal account, they can communicate and socialize with people using real name, alias, or anonymously, even with people they didn't know (Mix, 2011). It further extends to members of the social network who, though not knowing each other, get acquainted due to common interest. Most scholars (Naghshineh and Zardary, 2011; Smith, 2010) think that for smart users who make good use of social networks, there are more positive achievements than negative ones, such as

improving learning motivation, enhancing self-expression, actively taking part in social activities, joint creation, increasing access to knowledge, and so on. This study thus aims to make use of the advantages of social network and integrate them into instruction. The results of experimental teaching are listed in the following.

In learning achievements, instruction with Windows Live attains better learning achievements than traditional instruction, and students' achievements differ with the amount of time using Windows Live social network; the more they use it, the better the learning achievement. Besides, students' achievements differ with response times; the more times they respond, the better the learning achievement. The results of classroom observation and in-depth interviews show that Windows Live indeed increases students' learning interest, makes them focus on the course content, and consequently improves learning achievement.

In learning performance, the study shows that the first, in the dimension of "learning experience," students like IT class, often search information on the internet, and think they are rather good at information technology, but they are less likely to use blogs or to browse certain blogs regularly. The second, in the dimension of "satisfaction of Windows Live system," students can quickly register Windows Live ID and operate the system, and think it is easy to use. However, students think they cannot solve the problems they have when using Windows Live. The third, in the dimension of "learning interest," students think learning through Windows Live enables them to discuss their works with each other, and makes them understand better the course content, and they hope other courses can be instructed through this type of social network teaching method. Nonetheless, students only go to others' Windows Live websites to view their works during IT class. Finally, in the dimension of "learning anxiety," students do not feel stressed when learning through Windows Live, nor are they afraid of follow-up learning. However, students worry that others may have bad evaluation on their work, and that they may perform poorly when responding with Windows Live. The features of discussion and sharing of Windows Live enable the students to have interactive discussion, share experience and appreciate model works, which directly or indirectly improve learning effectiveness.

From the above information, this study concludes that the advantages of Windows Live social network indeed effectively enhance students' learning performance. This study also successfully integrates social network into elementary school education, which can serve as a successful reference case for teachers who intend to integrate social network into their instruction.

5.2 Suggestions

The following suggestions are based on the experimental teaching and may provide a reference for future researchers. The web page of Windows Live Spaces cannot render video and animation, hence limiting the teaching tool. Computer has become an essential learning tool for Taiwan's students; IT course starts in the 3rd grade, and information technology has become part of their daily

lives. If information technology equipment is to be used to enhance students' learning motivation, and further improve their learning performance and learning achievement, multimedia features that can attract students' visual and auditory attention should also be implemented. During the class, a small number of students browse websites that are not relevant to the course or chat on Windows Live Messenger, which affect students' concentration. The teacher has to spend time correcting such behaviors, and hence shortens the time of instruction. In order to reduce such misbehaviors of students, teachers must set the rules before class, and strictly enforce these rules to maintain classroom discipline.

Elementary schools in Taiwan are all equipped with 100M fiber-optic network, which is very fast and can quickly show the content of Windows Live website. But the network at students' homes is slower and takes a long time to present the website if the page contains too many images or Flash animation, so students have to wait for the page to complete, and then they can view the content and proceed on self-learning. Therefore, when designing the content, teachers must adjust the number and size of pictures, and present animation with other methods, so that students can quickly open the web page, and view the works or animation on the page according to their own interests and needs.

The most widely used blog site in Taiwan is 'wretch,' and students are accustomed to its blog system. In contrast, students are not familiar with the new system during the first few times of posting and responding, and teachers must put in more effort in designing the course to enable students to quickly become familiar with the system. Therefore, when integrating an IT tool into instruction, teachers must consider whether the interface of this IT tool is similar to the one currently used by most students. This can avoid the possibility that students may have less learning interest but more learning anxiety due to different tools or interfaces, and consequently resulting in reduced learning achievement and learning performance.

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