

Thai Students Learning through Smartphones

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บทคัดย่อ—งานวิจัยนี้มีวัตถุประสงค์เพื่อศึกษาการใช้
สมาร์ทโฟนเพื่อการเรียนรู้และความสัมพันธ์ระหว่างการใช้
สมาร์ทโฟนกับสุขภาพของนักเรียน กลุ่มตัวอย่างคือ
นักศึกษาระดับปริญญาตรีในประเทศไทยที่ใช้สมาร์ทโฟนเป็น
ประจำ เก็บรวบรวมข้อมูลจากผู้ตอบแบบสอบถาม 400 คน
และวิเคราะห์ข้อมูลโดยใช้สถิติเชิงพรรณนาและสถิติ
อนุมาน (Independent t-test, One-way ANOVA) ผลการวิจัย
พบว่านักเรียนใช้สมาร์ทโฟนเพื่อการเรียนไม่เกิน 10
เปอร์เซ็นต์ ผลกระทบของปัญหาสุขภาพของนักเรียนพบได้
ในดวงตา หูและนิ้วมือ โดยมีความเกี่ยวข้องกับเพศ จำนวน
ชั่วโมงที่ใช้ต่อวัน และระยะเวลาในการใช้
คำสำคัญ: ปัญหาสุขภาพ, สมาร์ทโฟน, การเจ็บป่วย
เนื่องจากการใช้โทรศัพท์

ABSTRACT

This research aims to study the use of smartphones for learning and the relationship between smartphone use and student health. The sample is undergraduate student in Thailand who regularly uses smartphones. Data were collected from 400 respondents and analyzed using descriptive statistics and inferential statistics (Independent t-test, One-way ANOVA). Research shows that students use up to 10 percent of their smart phones for learning. The effects of a student's health problem are found in the eyes, ears and fingers related to sex, the number of hours spent per day, and the duration of use.

KEYWORDS: *problem health, smartphone, illness due to using phone*

I. INTRODUCTION

Smartphones are very effective. It's can connect to the internet. Used in learning, watch movies, listen to music, play games, take photograph and document management. Although, there is no evidence to conclude that the use of smartphone affects the body.

But there is evidence that using smartphones has caused more accidents, as technologies forcing users to look at the screen. It is interesting to study the relationship of smartphone use and student health, such as eye, ear, finger and stress. This research is aimed at studying how smartphones affect health. To educate those who are interested in being guided in the prevention.

Results can be used as a guideline to use a smartphone safely. People can use their smartphones without getting sick because of improper smartphone use. Government can reduce the cost of health insurance to maintain health.

The research hypothesis stated that the differences gender affects different illness and the differences hours of phone using affects different illness.

The target population is 400 under graduate student in Bangkok, Thailand. The equation from Cochran (Glenn D. Israel, 1992) were used for populations with 95% confidence level and $\pm 5\%$ precision is as follow:

$$n_0 = \frac{Z^2 pq}{e^2} = \frac{(1.96)^2 (0.5)(0.5)}{(0.05)^2} = 385$$

The time range is from November 2015 to March 2016. The sample size is 385 students, but for errors that may occur during the process, it is adjusted to about 400 students. Use quantitative methods in this research. Data were collected by using three parts of questionnaires. First is students' information. The next part consists of a telephone environment and the last one is a student's health question. Statistics used in data analysis were percentage, mean, standard deviation, Independent t-test and One-way ANOVA, For major improvements, the LSD difference test (the least significant difference) for statistical analysis.

II. LITERATURE REVIEW

According to the revolution of the information technology, web-based learning or Distance learning systems had been widely employed in both educational and non-educational institutions in many countries. Some online learning is a way of studying for an internationally qualification without needing to attend classes on campus. Student can study and review the lessons anytime anywhere. In Thailand, web-based learning has been widely used, for examples, new staff training in the organization, knowledge sharing in community and student learning in university.

A smartphone is seen as a small computer that can carry and receive calls. The smartphone has wireless connectivity with Bluetooth, 4G, WIFI Port and Mini USB. The smartphone can play multimedia such as movies and music. It can also take pictures as well. Smartphone users can install applications to empower their phones to meet their needs, such as the learning they need.

In Thailand, National Electronics and Computer Technology Center (NECTEC) reported that the percentage of total visited to learning website is still low.

For smartphones, Health Information System Development Office (HISO) [1] points out that the impact of using smartphones can have a significant

impact on the user's mind and body if users use their smartphones for a long time. Supported by Nattayaporn [2], which uses the Internet, Facebook, or social networks. For a long time may have a social and emotional impact on the user. Sponsored by Dr. Suchat et al. [3]. In the future there will be new diseases arising from the use of technology.

Dr. Yuthana [4] and Dr. Vasu [5] argue that computer vision syndrome (CVS) is a physical illness. It's can cause eye pain, eye strain, fatigue, nausea, blurred vision, and visual problems. Due to long-term computer screen or small text size, a small screen and a slight contrast may focus on the screen to see the object.

III. ANALYSIS OF DATA

A. DEMOGRAPHIC DATA

Table 1. Distribution of respondents by gender.

Gender	Male	Female
Frequency	201	199
Percentage	50.25	49.75

The majority of respondents in this study are male, followed by female.

Table 2. Distribution of respondents by age.

Age	Less than or equal to 19 years	20 years	21 years	More than 21 years
Frequency	19	63	272	46
Percentage	4.75	15.75	68.00	11.50

The results shown the majority respondents are 21-years old. The minority is less than or equal to 19 years.

Table 3. Distribution of respondents on number of hours for using per day.

Hours for using	Frequency	Percentage
Less than 4 hours	80	20.00
Between 4 - 6 hours	240	60.00
More than 6 hours	80	20.00
Total	400	100.00

The results shows the most respondents use smartphone 4 – 6 hours a day.

Table 4. Summary distribution respondents on physically and mentally illness.

Illness	\bar{x}	S.D.	Result	Order
Blurred vision	2.72	1.08	Uncertain	2
Need to adjust the louder sound	2.12	1.21	Uncertain	3
Fingertip pain	2.04	1.22	Uncertain	4
Feel boring	3.12	1.24	Uncertain	1

From Table 4, respondents has all illness in uncertain level.

Table 5. The using of smartphone.

Purpose	Frequency	Percentage
Play game	225	56.25
Watch movie	88	22.00
Social	321	80.25
Learning	39	9.75

The Table 5 shown the majority respondents use smartphone for play social network. Use smartphone for play game at 56.25%. The minority is using for learning.

Table 6. The using web-based learning.

		Frequency	Percentage
Using experience On web-based learning	less than 1 year	161	40.25
	Between 1 and less than 2 years	81	20.25
	Between 2 and less than 3 years	62	15.50
	Above 3 years	96	24.00
Using web-based learning per week on average	Less than 1	100	25.00
	1 – 2 times	48	12.00
	3 – 5 times	156	39.00
	Once a day	44	11.00
	Several times a day	52	13.00

Results 40.25% of the respondents had experience in using web-based learning less than 1 year. Respondents had experience in using web-based learning above 3 years is 24%. Only 39% of the

respondents used web-based learning between 3 to 5 times a weeks. And 25% of respondents used web-based learning less than once a weeks.

B. DATA ANALYSIS

Table 7. Data analysis for testing that the health of students were vary with their gender.

Illness of respondent	t-test for Equality Mean				
	Gender	\bar{x}	S.D	t	df
Blurred vision	Male	2.49	0.906	-4.429	0.105
	Female	2.95	1.186	***	0.106
Need to adjust the louder sound	Male	1.80	0.896	-5.571	0.117
	Female	2.45	1.391	***	0.117
Fingertip pain	Male	1.64	0.743	-0.065	0.098
	Female	1.64	1.167		0.098
Feel boring	Male	2.89	1.397	-3.85	0.122
	Female	3.36	1.019	***	0.122

* Significant level at 0.05

The result of Independent t-test shown gender affect the health that female has blurred vision, need to adjust

the louder sound, and feel boring when using with smart phone more than male at significant level <0.05.

Table 8. Data analysis for testing that the health of students were vary with number of hours for using smartphone.

Illness of respondent	Source of Variation	SS	df	MS	F	Sig.
Blurred vision	Between groups	79.360	2	39.680	50.233	0.000
	Within Groups	313.600	397	0.790		
	Total	392.960	399			
Need to adjust the louder sound	Between groups	116.907	2	58.453	49.445	0.000
	Within Groups	469.333	397	1.182		
	Total	586.240	399			
Fingertip pain	Between groups	19.627	2	9.813	6.814	0.001
	Within Groups	571.733	397	1.440		
	Total	591.360	399			
Feel boring	Between groups	125.440	2	62.720	50.527	0.000
	Within Groups	492.800	397	1.241		
	Total	618.240	399			

The results indicate that the number of hours used affects all symptoms at a significant level <0.05. Post

hoc testing is therefore used to identify the difference between times spent with illness.

Table 9. Post Hoc Test between each number of using hours and respondents' illness in the blurred vision.

Number of using hours	\bar{x}	Less than 4 hours	Between 4 to 6 hours	More than 6 hours
		1.56	2.75	3.8
Less than 4 hours	1.56		-1.19 (0.020)*	-2.24 (0.031)*
Between 4 - 6 hours	2.75			-1.05 (0.001)*
More than 6 hours	3.80			

* Significant level at 0.05

From Table 9, analysis of data on the number of hours spent with the eyes of the retina responded to blurred vision symptoms. The LSD tests showed

significantly different variances in each pair of hours of use. The respondents were: It takes a long time to have blurry vision symptoms, rather than those that Less used

Table 10. Post Hoc Test (LSD) between each number of using hours and respondents' illness in ears (need to adjust the louder sound).

Number of using hours	\bar{x}	Less than 4 hours	Between 4 to 6 hours	More than 6 hours
		1.80	1.87	3.20
Less than 4 hours	1.80		-0.67 (0.635)	-1.40 (0.000)*
Between 4 - 6 hours	1.87			-1.33 (0.000)*
More than 6 hours	3.20			

* Significant level at 0.05

From Table 10, analysis of data on the number of hours used by the respondent's ear. The LSD test showed significant differences in the number of hours

each respondent used. The respondents who worked more than 6 hours per day had symptoms on ears more than those less used.

Table 11. Post Hoc Test (LSD) between each number of using hours and respondents' illness in the fingertip pain.

Number of using hours	\bar{x}	Less than 4 hours	Between 4 to 6 hours	More than 6 hours
		2.20	1.87	2.4
Less than 4 hours	2.20		0.33 (0.032)*	-0.20 (0.293)
Between 4 - 6 hours	1.87			-0.533 (0.001)*
More than 6 hours	2.40			

* Significant level at 0.05

From Table 11, data analysis using the number of hours spent on finger pain of the respondents. The LSD test results were significantly different at each hour of

use. The number of respondents who used the phone for a long time were more finger pain than less active.

Table 12. Post Hoc Test (LSD) between each number of using hours and respondents' illness in feel boring when work through smartphone.

Number of using hours	\bar{x}	Less than 4 hours	Between 4 to 6 hours	More than 6 hours
		1.90	3.3	3.8
Less than 4 hours	1.90		-1.4 (0.071)	-1.9 (0.010)*
Between 4 - 6 hours	3.30			-0.5 (0.044)*
More than 6 hours	3.80			

* Significant level at 0.05

From Table 12, analysis of data on the number of hours spent with respondents feel bored when working on smartphones. The LSD test showed a statistically significant difference for each pair of time users. The

respondents who takes more than 6 hours feels boring when works via smartphone text rather than less active ones.

IV. CONCLUSIONS AND SUGGESTIONS

Respondents are undergraduates in Thailand. Most are under the age of 21 and use the smartphone for 4-6 hours a day on average. The majority respondents use smart phone for play social networks and play games. The minority uses their smart phone to learn. 40.25% of the respondents had experience in using web-based learning less than 1 year. Respondents had experience in using web-based learning above 3 years is only 24%. 39% of the respondents used web-based learning between 3 to 5 times a weeks. And 25% of respondents used web-based learning less than once a weeks.

Instructors should create compelling content on the web rather than content used in the classroom. To attract more students to use the web-based learning system. Not just use the web-based learning system download the document. Instructors should be able to tell students how they can access the web-based learning system. Instructors should make students interact more with the web-based learning system for example, go to the answer some questions or comment on forum.

From the result, we found that respondents had slightly health problems with the use of smartphones both physically and mentally at an uncertain level.

Physical illness, respondents agree that they have a slightly blurred vision, need to adjust the louder sound, and fingertip pain when work through smartphone.

Mentality illness, respondents agree that they have a slightly feel boring when work through smartphone.

The results shown that health issues remain with the use of smartphones. But those who have a greater or most probably did not answer the questionnaire.

Finally, the results shown that the most important situations that cause health problems are age and number of hours spent. Females are perceived symptoms than men. The respondents, who used smartphones a lot may occur some illness. The finding consistently confirmed to previous studies about illness form phone using, Nattayaporn [2], Peter [6], Vasu [5], Yutthana [4] who concluded that more period of phone using more eyes symptoms. This situation can affect future health problems.

Therefore, it should focus on the content of smartphones and so on will help reduce the problem of both physical and mental health. It also reduces the cost of medical expenses. For example, control students do not use the phone for long periods of time and do not use the phone more than 6 hours a day.

Causes of finger pain do not differ due to inadequate time to detect possible abnormalities.

Research should be tested further as follows.

1. Studies are required to test same sample that they have declining symptoms or not, after gaining knowledge of how to use smartphone.

2. Studies a new group of sample, such as those who already work. That the physical and psychological

illness due to the use of smartphones similar or different.

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