

# A Survey on the Smart Phone Usage and Social Media Access of the Elementary School Students in Bangkok and Samut Prakan during the COVID-19 Pandemic

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**Abstract:** With the COVID-19 prevention/protection measures all the year 2021, Thai students (including elementary school students) have to study in the online mode via computers or mobile devices (e.g., smart phones). Thus, it is interesting to study about their use and related issues. This study was conducted in July 2021 with more than 4.700 elementary school students who were 6-13 years old approximately in Bangkok and Samut Prakan province. It has been found that the major purpose of the students' smart phone usage is for online-learning rather than for YouTube and other social media platforms, including LINE and TikTok. The negative effect is they talk online with their peers heavily and interact personally with their own family much less. Besides, it has been found that their concentration to study is also decreased, while their self-esteem tend to be lower by the impact of social network competition. Lastly, it has been found that their cybersecurity awareness level is medium. Therefore, the parents should take care of their children and give them the appropriate advices how to cope with the smart phone usage and social media access.

**Keywords—** Mobile phone, Social media platform, Elementary school students, Online learning.

## I. INTRODUCTION

The first official evidence about the Coronavirus disease 2019 (COVID-19) was reported by Wuhan Municipal Health Commission in China at the end of December 2019 that there was a cluster of pneumonia in Wuhan, Hubei province. Then this disease had spread globally [1]. Recently, it has been reported by the World Health Organization (WHO) that the numbers of the confirmed cases and the deaths passed 270 million cases and 5.3 million deaths [2].

While the COVID-19 pandemic is still affecting the world, the students in many countries have to study online.

Particularly in Thailand, the number of the new COVID-19 cases reached over 10,000 cases a day for the first time in mid-July [3]. Bangkok, the capital city of Thailand becomes the most critical city compared to the other cities or provinces. With the COVID-19 prevention and protection measures announced by the Thai government, the students in all levels (e.g., elementary and high school levels) have to study online with no choices.

To study online, a student must have a computer or a mobile device (e.g., a smart phone or a tablet). For those devices, a smart phone seems the cheapest, thus, it is possible that the poor students tend to buy and use a low-price smart phone for online learning. The fact is number of mobile subscribers also shows that it is more than 117 million subscribers, while the number of Thai populations is about 70 million people [4]. That means each of them should have at least a smart phone for online learning purpose. However, if elementary school students cannot control themselves or be controlled by their parents, smart phones may affect their learning habits and behaviors.

In Bangkok, focusing on elementary schools, excluding

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kindergarten level, middle schools, and above, there are more than 500 elementary schools, including government schools, private schools and international schools [5-7]. As assumed from the previous data [5-7], In Bangkok, there are more than 300,000 elementary school students approximately in total who study online at present.

Similar to Bangkok, focusing on elementary schools in Samut Prakan province, excluding kindergarten schools, middle schools, and above, there are more than 220 elementary schools, including government schools and private schools [8]. As estimated from the data shown in [8], There are more than 90,000 elementary school students approximately in total who should study online at present in this province. However, the actual number may be lower since some parents of some students in Samut Prakan are the low-income families. They cannot afford smart phones and Internet service.

Therefore, it is interesting to study about the smart phone usage behaviors of the elementary school students in Bangkok and Samut Prakan and the consequences. However, this article is the extended version of the paper presented by Daengsi and Sirawongphatsara [9]. Furthermore, a few interesting issues have been added and discussed, while a few issues have been corrected. For the structure of this paper, it is as follows: firstly, background

information on the COVID-19 prevention and protection measures and the online learning of Thai elementary school students in Bangkok and Samut Prakan is presented. Secondly, the related research works based on smart phone usage by Thai students and the related issues are described. Thirdly, the methods applied in this study is explained. Fourthly, the results and analysis are presented. Lastly, the discussion and the conclusion are presented in Section V.

## II. PREVIOUS RESEARCH WORKS

After surveying prior research works briefly, many papers based on smart phone usage of Thai students and the related topics were found. Also, a few papers from the other countries were included. However, only 25 papers were selected to present in this section. All of them are presented in Table I, some of them are described as follows [10-33]:

- 15 papers were studied with college or university students.
- One third of (eight papers) the studies with middle-high school students.
- Many of 11 papers studied based on social media.
- Most of them studied using offline questionnaires
- Six of the studies focused on smart phone issue.
- The top two papers for the number of participants

TABLE I  
Previous studies

Author(s)	Year	Samples				Major Issue			Methodology	Sample (N)	City or Country	Remark
		Elementary	Middle-high	University	Internet	Social Media	Gaming	Smart Phone				
Khajornboon et al. [10]	2013	-	✓	-	-	-	✓	-	Questionnaires	375	Chai Nat	Computer games
Chalongsuk et al. [11]	2014	-	-	✓	-	✓	-	-	Questionnaires	275	Nakhon Pathom	
Khorpornprasert [12]	2014	-	-	✓	✓	-	-	-	Questionnaires	700	Bangkok	
Morphitou [13]	2014	-	-	✓	-	-	-	✓	Personal survey	124	Cyprus	South Europe
Poomjan et al. [14]	2015	-	-	✓	-	✓	-	-	Questionnaires	369	Bangkok	
Wongsopha [15]	2015	-	-	✓	✓	-	-	-	Questionnaires	386	Loei	
Juinam & Chantaranamchoo [16]	2015	-	✓	-	-	✓	-	-	Interview & group conversation	370	Sukhothai	
Lampetch [17]	2016	-	✓	-	-	✓	-	-	Questionnaires	620	Nonthaburi	
Viphatphumprathes [18]	2016	-	-	✓	-	-	-	✓	Questionnaires	323	Bangkok	
Jandaeng [19]	2016	-	-	✓	-	✓	-	-	Questionnaires	392	Phayao	
Pengcharoen et al. [20]	2016	-	-	✓	-	✓	-	-	Questionnaires	378	Bangkok	
Supharakornsakul [21]	2017	-	✓	-	-	✓	-	-	Questionnaires	380	Phetchabun	
Koikitcharoen & Chaiyakot [22]	2017	-	✓	-	-	✓	-	-	Questionnaire	504	Phuket	
Džapo & Duić [23]	2017	-	✓	✓	-	✓	-	-	Content analysis method	400	Croatia	Europe
Kempanya [24]	2018	-	✓	-	✓	-	-	-	Questionnaires	346	Nakhon Phanom	
Kosalpraphai et al. [25]	2018	✓	-	-	✓	-	-	-	Questionnaires	356	Bangkok	
Sithipanya [26]	2019	-	-	✓	-	✓	-	-	Questionnaires	400	Nakhon Sawan	
Uraivan et al. [27]	2019	-	-	✓	✓	-	-	-	Questionnaires	491	Suratthani	Depression
Suwacharoen [28]	2019	-	✓	-	-	-	-	✓	Questionnaires	291	Nonthaburi	
Srithong [29]	2019	-	-	✓	-	-	-	✓	Questionnaires	160	Lopburi	
Námesztovszki et al. [30]	2019	-	-	✓	-	-	-	✓	Questionnaires	329	Hungary and Serbia	m-Health
Thongmeekhaun et al. [31]	2020	-	-	✓	-	✓	-	-	Questionnaires	188	Songkha	
Khamcharoen & Polnigongit [32]	2020	✓	-	-	✓	-	-	-	Questionnaires	400	Nakhon Ratchasima	Digital Literacy skills
Madlala et al. [33]	2020	-	-	✓	-	-	-	✓	Questionnaires	364	South Africa	Africa

are [12] and [17] with 700 and 620 subjects respectively.

- There are six papers studied based on Internet usage that is the same number as smart phone usage.
- There are only two papers studied based on elementary school students [25], [32], while it was found from [32] that the older elementary school students have higher digital literacy skills than younger students.

One can see that there are only a few research works that studied with the elementary school students. Therefore, there are research gaps for conducting the study with this sector of students and the high numbers of participants using online questionnaire in order to investigate for some interesting issues.

### III. METHODOLOGY

This study was conducted by using an online-questionnaire form using 5 scale rating in order to survey the behavior of the elementary school students in Bangkok and Samut Prakan province. Although the maximum number of subjects for mass surveying is 400 subjects, this study was performed with thousands of students in Bangkok and Samut Prakan province.

The questionnaire form was evaluated by three experts, the evaluation result, which is called Index of Item Objective Congruence (IOC), is 0.98. Also, the questionnaire form was evaluated and calculated for the Cronbach's Alpha Coefficient from the results provided by 30 pilot subjects, which is 0.84. This means that this questionnaire form has high reliability. Then, the online-questionnaire form was distributed to 12 middle size and large size elementary schools in Bangkok and 10 the same criteria elementary schools in Samut Prakan province in July 2021. Each school has more than 600 students.

After gathering the data from the survey, the average score for each issue was calculated. Then the results are interpreted, following the meaning as shown in Table II, and presented in Section IV.

TABLE II  
MAPPING BETWEEN AVERAGE SCORES AND THE MEANING

Average Score	Meaning
4.21-5.00	Very high
3.41-4.20	High
2.61-3.40	Fair
1.81-2.60	Low
1.00-1.80	Very low

### IV. RESULTS AND ANALYSIS

After obtaining the results from the survey, it was found that there are only students (or the parents) from eight elementary schools in Bangkok and three elementary schools in Samut Prakan province responded to the online-survey. For the respondents, there were 4,715 students in

total, consisting of 2,983 students (63.30 %) from Bangkok and 1,732 students (36.70 %) from Samut Prakan province (2,414 males (51.20 %) and 2,301 females (48.80 %)) for high reliability with 6-13 years old in age.

Although, there were many questions in the questionnaire, only the very interesting issues are presented in this paper, as follows:

#### A. Purposes of Smart Phone Usage

For this issue, the students were allowed to select more than one answer. One can see from Fig. 1 that 84.4% of them use smart phone for online-learning that is consistent with the COVID-19 prevention and protection measures in this period of times. However, it was found that students use their phones for video-streaming and video gaming more than doing their homework and self-study.

#### B. Social Media Access

From Fig. 1, it was found a lot of students who use their phones for video-streaming (including YouTube) and the other social media platforms. Therefore, the additional issues based on social media access was investigated. The result for social media access is illustrated in Fig. 2. As shown in the figure, one can see that YouTube is the first place with 80.7%. For the second to the fifth place, they are LINE (75.6%), TikTok (56.0%), Facebook (42.0%) and Instagram (11.9%) respectively, whereas Twitter (4.0%) is the eighth place.

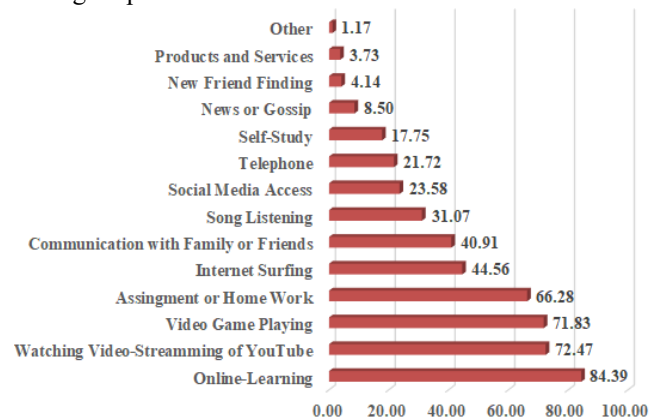


Fig. 1. Purposes of smart phone usage

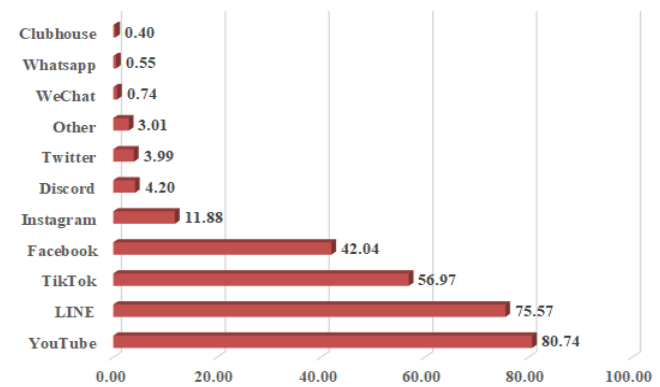


Fig. 2. Social media access

### C. Heavy Usage

For the question, “นักเรียนใช้เวลาในการใช้โทรศัพท์เคลื่อนที่มากกว่าการทำกิจกรรมอื่น ๆ” (The student spends more time for mobile usage than other activities), the study revealed that from the overall results of the answers associated with this issue, the students accept that they spend time with their mobile devices more than other activities tremendously (average score =  $3.43 \pm 0.96$ ).

### D. Interaction with Their Family Members

In the questionnaire form, there is a question as follows: “นักเรียนรู้สึกว่ามีปฏิสัมพันธ์กับคนในครอบครัวน้อยลง” (The student seems to have less interaction with the family members). For the overall results of the answers for this topic, it was found that the interaction between the students and their family members decreases moderately (average score =  $2.69 \pm 1.00$ ).

### E. Concentration

For the question, “นักเรียนรู้สึกไม่มีสมาธิในการทำสิ่งต่าง เช่น การเรียน...” (The student loses focus on doing things, such as studying...), it was found from the overall results of the answers associated with this topic that the students tend to believe that they lose concentration to study and reading (average score =  $2.75 \pm 1.11$ ).

### F. Low Self-Confidence Compared to the Others

For the question, “นักเรียนรู้สึกไม่มั่นใจในตนเอง เมื่อเปรียบเทียบกับเพื่อนหรือบุคคลอื่นในเครือข่ายสื่อสังคมออนไลน์” (The student loses self-confidence when compared to friends or the others in social media networks), it was found from the overall results of the answers related to this issue, the students have low self-confidence when compared to friends or the others moderately (average score =  $2.67 \pm 1.06$ ).

### G. Cybersecurity Awareness

For the question, “นักเรียนทราบถึงอันตรายที่มีอยู่บนสื่อออนไลน์หรือเกมที่เล่น” (The student is aware of the drawback of social media access and games). it was found from the overall results of the answers associated with this issue that the students have medium level of cybersecurity awareness (average score =  $3.31 \pm 1.10$ ).

## V. DISCUSSION AND CONCLUSION

Based on the COVID-19 pandemic, even elementary school students have to adapt themselves to study in online mode via smart phones, other mobile devices or computers. Nevertheless, from this study with very large size of samples (4,715 students) from Bangkok and Samut Prakan province, it has been found that many of them spends time with mobile devices more than other activities significantly. The major social medias for them are LINE, TikTok and

Facebook. However, if the students spend times with smart phones too long, it would impact their relationship with their parents. Furthermore, students will have low concentration to study, while many of them may have low self-confidence and will not realize about the cyber-threats from social media and online game. These issues are consistent with previous studies from other researchers.

Therefore, the parents should pay more attention to children and give good advices for social media access and its disadvantages and cyber-threats. Also, they should encourage the children to do some other activities instead of being with their phones only. Furthermore, the students should be provided cybersecurity awareness knowledge since elementary school level.

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## REFERENCES

- [1] WHO, “Archived: WHO Timeline - COVID-19.” <https://www.who.int/news/item/27-04-2020-who-timeline---covid-19>, Accessed on 15 Dec 2021
- [2] WHO, “WHO Coronavirus (COVID-19) Dashboard.” <https://covid19.who.int/>, Accessed on 15 Dec 2021
- [3] Bangkok Post, “Record 141 Covid deaths, 10,082 cases. Bangkok Post.” <https://www.bangkokpost.com/thailand/general/2150335/record-141-covid-deaths-10-082-new-cases-reported-saturday>, Accessed on 15 Aug 2021 (In Thai)
- [4] NBTC, “Mobile Subscribers.” [http://tid.nbt.go.th/mobile\\_sub](http://tid.nbt.go.th/mobile_sub), Accessed on 15 Aug 2021 (In Thai)
- [5] PESA, “Data collection of web site Primary Educational Service Area in Bangkok.” [http://www.planbkk.com/news-detail\\_8547](http://www.planbkk.com/news-detail_8547), Accessed on 15 Aug 2021 (In Thai)
- [6] DGA, “Data Set Schools of the Basic Education in 2020.” <https://data.go.th/dataset/bangkok001>, Accessed on 15 Aug 2021 (In Thai)
- [7] OPEC, “Private Education statistics for the year 2562.” Retrieved from <https://opec.go.th/ข้อมูลสารสนเทศ-2>, Accessed on 15 Aug 2021 (In Thai)
- [8] Department of Local Administration (DLA), “The number of students in the Department of Local Administration.” <https://web.archive.org/web/20200215203103/http://sis.dla.go.th/reports/report02.jsp>, Accessed on 15 Dec 2021 (In Thai)
- [9] T. Daengsi and P. Sirawongphatsara, “A Survey on the Smart Phone Usage and Social Media Access of the Elementary School Students in Bangkok and Samut Prakan during the COVID-19 Pandemic,” Proc. of EECON-44, Nan, Thailand, 2021.
- [10] H. Khajornboon, P. Pornmalee and N. Chaloeuywares, “A Study of the Relationship between Computer Game Playing Behavior and Learning Achievement of Lower Secondary Students in Chai Nat Province,” Journal of Graduate School, Pibulsongkram Rajabhat University, vol. 7, no.2, pp.89-98, 2013. (In Thai)
- [11] R. Chalongsuk et al., “Usage Behavior and Attitude of the Pharmacy Students of Silpakorn University toward Social Media for Education,” Veridian E-Journal, vol. 7, no 2, pp. 802-812, 2014. (In Thai)
- [12] B. Khorpornprasert, “The Behavior and Impacts of Using Facebook of University Students in Bangkok,” Romphruek Journal, vol. 32, no.2, pp.1-24, 2014. (In Thai)

- [13] R. N. Morphitou, "The use of smartphones among students in relation to their education and social life," *IMCL2014*, 2014, pp. 315-319.
- [14] P. Poomjan, N. Hongliam and P. Odompet, "Online social media usage behaviors of preclinical medical students of Faculty of Medicine Siriraj Hospital," *Siriraj Medical Bulletin*, vol. 8, no. 1, pp 27-35, 2015. (In Thai)
- [15] A. Wongsopha, S. Saisisod and N. yanwarn, "The Usage Behavior on Facebook Social Media Online and Their Effects on Students' Life Style: A Case Study of Loei Rajabhat University," *Research and Development Journal*, vol. 10, no. 33, pp.1-10, 2015. (In Thai)
- [16] C. Juinam and N. Chantaranamchoo, "The Behaviors and Effects of Using Social Networks of the Junior Secondary School Students in Sukhothai province." *Veridian E-Journal*, Slipakorn University, vol. 8, no 3, pp. 84-95, 2015. (In Thai)
- [17] S. Lampetch, "Behavior and Impact of Using Social Network of Secondary School Students in Nonthaburi Province," *Suthiparithat Journal*, vol.33, no. 93, pp. 116-130, 2016. (In Thai)
- [18] T. Viphatphumiprathes, "IN-CLASS Smartphone Usage Behaviors Among Dhurakij Pundit University StudentS," *Suthiparithat Journal*, vol.30, no. 95, pp. 48-58, 2016. (In Thai)
- [19] P. Jandaeng, "Social Network Using Behavior of Undergraduate Students of University of Phayao," *Journal of Humanities and Social Sciences University of Phayao*, vol. 4, no. 2, pp. 44-54, 2016. (In Thai)
- [20] S. Pengcharoen, Y. Wathimethi and S. Ritmontri, "Factors Affecting Attitude on Using Social Network of Senior Students at Katsart Bangkhen University," *Vajira Nursing Journal*, vol. 18, no. 2, pp 63-74, 2016. (In Thai)
- [21] Y. Supharakornsakul, "Phetchabun High School Student's Behaviors in Using Online Social Networks and Their Impact," *Humanities and Social Sciences Journal*, vol. 8, no. 2, pp. 53-71, 2017. (In Thai)
- [22] D. Koikitcharoen and S. Chaikyot, "The Behaviors of Online Social Network Use of Junior High School Students in Phuket Province," *Journal of Graduate Studies in Northern Rajabhat Universities*, vol. 7, No.13, pp.1-14, 2017. (In Thai)
- [23] P. Džapo and M. Duić, "Publishing of personal information on Facebook with regard to gender: Comparison of pupils and university students," *MIPRO2017*, 2017, pp. 818-823.
- [24] P. Kempanya, "Internet Usage Behavior of Senior Hing School Students In The Mueang Nakhone Phanom Muncicipality Area," *Nakhon Phanom University Journal*, vol. special, pp 120-124, 2018. (In Thai)
- [25] A. Kosalpraphai, K. Kiatrungrit and P. Seree, "Association between Parental Internet Use and Behavioral Problems in Elementary Students," *Journal Psychiatr Assoc Thailand*, vol. 63, no. 2, pp 101-114, 2018. (In Thai)
- [26] R. Sitthipanya, "The use of online media of Nakhon Sawan Rajabhat University students," *Journal of Graduate Review Nakhon Sawan Buddhist College*, Vol.7, No. 2, pp. 45-56, 2019. (In Thai)
- [27] P. Uraiwai, M. Leeyutthanont and J. Kaewsakulthong, "The relationships between Personal factors Internet Utilization and Depression of Nursing Students of Boromarajonani College of Nursing, Suratthani," *Journal of Health Research and Innovation*, vol.2, no. 1, pp. 12-24, 2019. (In Thai)
- [28] S. Suwancharoen, S. Thamma-in, S. Kerdmuang, O. Pinitchan and P. Chumchai, "Behaviors and Effects of Smartphone Usage among
- [29] P. Džapo and M. Duić, "Publishing of personal information on Facebook with regard to gender: Comparison of pupils and university students," *MIPRO2017*, 2017, pp. 818-823.
- [30] P. Kempanya, "Internet Usage Behavior of Senior Hing School Students In The Mueang Nakhone Phanom Muncicipality Area," *Nakhon Phanom University Journal*, vol. special, pp 120-124, 2018. (In Thai)
- [31] T. Thongmeekhaun, S. Saetiaw, V. Juntaveemuang, T. Kitrungrrote and J. Paenkaew, "Online Social Network UsingBehavior amongNursing Students of Boromarajonani college of Nursing, Songkhla," *Journal of Nursing, Siam University*, vol.21, no. 41, pp. 67-77, 2020. (In Thai)
- [32] P. Khamcharoen and W. Polnigongit, "The Study of Digital Media Usage Behavior and Digital Literacy skills of the Elementary School Students," *The Journal of Social Communication Innovation*, vol.8, no. 1, pp. 54-66, 2020. (In Thai)
- [33] M. Madlala, S. Civilcharran and U. G. Singh, "Understanding students' usage of smartphone applications for learning purposes: A case study," *ICACCE2020*, 2020, pp. 1-5

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