

SMARTPHONE USAGE AMONG COLLEGE STUDENTS

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Abstract

Smartphone usage among college students is common in daily life, but a research about the behaviour and effects of using smartphone among college students has not been conducted. The purpose of the research is to obtain an illustration and explanation of the usage of smartphone among college students in Bandung city. This research used a quantitative method. The results confirmed that students might choose a smartphone are because of its comprehensive features, affordable price, popularity, operating system, quality, games and camera features. Students spent nearly 6 hours per day with their smartphone. They took only 2 to 6 hours for social activities. It was also found that students read their course for less than 2 hours. The applications that are frequently accessed using smartphone are instagram, line, and whatsapp. The behaviour of putting smartphone besides the bed is also quite high. This study brings important information, specifically the **smartphone** can give bad impact to the social behaviour of students since they spend more of their time to interact in their smartphone rather than engage in real social activity.

Keywords: Bandung, College students, Smartphone.

1. Introduction

Indonesia has a rapid growth of smartphone users, which nearly reach 100 million people among approximately 250 million populations and is in the 5th place of a country with active smartphone users after China, India, and USA/America [1]. The use of smartphone with complete features inside nowadays cannot be separated from every activity regardless of the people background. According the statistical data, it revealed that 3.9% of the total population recorded on June 2018 are the university students studying at either public or private university [2]. Among the students, smartphone is not only used to communicate but also to study or even access other media that favoured or needed by the students.

There were plenty of research, which investigated the usage of the smartphone. Falaki et al. [3] studied the interaction between the smartphone and energy usage. They showed the average number of interactions per day and the average amount of data received per day. Lee et al. [4] studied about the negative effect of the smartphone usage on psychological traits and compulsive behaviour. In line with Lee et al. [4], Van Deursen et al. [5] indicated that the addictive smartphone behaviour had a strong relation with social stress. Do et al. [6] showed the strong dependencies between the smartphone usage and social life. Joo and Sang [7] reported the technology acceptance of Korea Smartphone. Meanwhile, in the correlation with the university students, Gokclearsan et al. [8] modelled the smartphone addiction among university students. However, there is no research about the usage of smartphone, which is focused on the university student to explain comprehensive illustration, including the behaviour and effects of both from economic and education sides. Therefore, this research tries to describe the usage of the smartphone among college students from the view of education and economic as well to contribute information sources for parents, university management, and related companies.

Considering the gap that exist in the relevant body of research as well as the phenomenon regarding the use of smartphone among the students, this research set three purposes to find out as the following. The first purpose is to understand the expense per month that is spent by students to purchase phone credit. This could be used as additional information sources for parents in terms of knowing the student's expense to purchase credits. The second purpose from this research is to comprehend the main reason why the students purchase certain smartphone brands. This information could be used by the smartphone producer's companies to develop a more suitable and desirable product for the student as a consumer. The third purpose is to understand student's communication behaviour using the smartphone. By knowing smartphone usage pattern in college students, lecturers might try a more effective way to communicate and deliver materials to the students. Additionally, the pattern also helps companies to obtain information on how to deliver their message better if their targeted consumer is a student; hence, the company could reduce their advertising cost.

2. Literature Review

Basically, smartphone is a term used to show telephone technology with extensive functions. Smartphone can be defined as a device that enables the user to make telephone calls. At the same time, it has some features that allow the user to do activities while that in the past was not possible unless using a computer or a

personal digital assistant (PDA), such as sending and receiving e-mails, as well as amending an office document [9]. As an example, Doc to Go application enable the users to edit word documents on the smartphone. Another ability that smartphone has is that it can be used to access Internet with the browser contents that is almost the same with a person who accessed the web with Computer such as Opera Mobile [10]. Smartphone now runs on processors with high processing speeds that have low power consumptions. This device allows us to play games, browse the Web, and do other applications including the latest technology of virtual reality [11]. However, the usage of the smartphone also has some negative effects. Lee et al. [4] studied that the use of the smartphone creates psychological traits and compulsive behaviour. In line with this report, Van Deursen et al. [5] indicated that the addictive smartphone behaviour had a strong relation with social stress. The usage of smartphone, which give both positive and negative effects, should be maintained in order to give more advantages that meet the users' purposes.

Relevant to the college students, smartphone brings both positive and negative effects. Buck et al. [12] mentioned that Smartphone positively can be used to access course materials or scientific research. They stated that "the technology of smart phone creating an engagement between student and learning environment in the 21st Century. Easy access to virtual classroom, and specific research as well as study flash card notes allows students to have autonomy in their learning process. The learning method through education applications (i.e., apps) assists students to learn in a revolutionary and advanced way [13]. In another hand, mobile technology has also radically changed the cultural norms and behaviour [14]. Since the use of smartphone in the college now has been shifting to support learning process, it is necessary to research the usage of smartphone comprehensively, in education and economic side to provide literature for the parents, university and related company as well.

3. Method

The research used a quantitative approach method. Quantitative data use numbers to describe what exists. A major benefit of these data is that they may be fed into a computer where they can be counted, stored, and manipulated [15]. Data collection method was done by conducting a survey by distributing questioners to 399 university students, which are a proportional representation from 21 public and private universities in Bandung, West Java, Indonesia. Samples were taken by using proportional random sampling technique. The questions that was asked include the name of the university/institution, student's name, age, gender, semester, smartphone brand that the person use and the reasons why they chose the brand, behaviour when using smartphone, and cumulative achievement index.

3.1. Population and sample

The 399 university students were selected as sample from 21 universities with the consideration that those universities have 92% (236.846 students) of the total number of students from 41 universities in Bandung (257.629 students; see Table 1). Bandung is located in West Java, Indonesia [16].

The questioner distribution was conducted from April until June 2018. The sample collection in the survey used the approach of a formula as [9] $n = N/(1+N.e^2)$ where n is the number of samples or sample size, N is the total

population (236.846), and e is the error tolerance (95% confidence level; 0.05). Based on this equation, the value of n can be obtained as $n = 236.846/(1+236.846 \times 0.05^2) = 399.3$.

Table 1. Respondent characteristic.

University	Student body	Number of sample
Universitas Padjajaran	36,288	61
Universitas Pendidikan Indonesia	34,343	58
Universitas Telkom	23,426	40
Politeknik Negri Bandung	18,897	32
Universitas Pasundan	16,289	28
Universitas Islam Negri Sunan Gunung Jati	13,395	23
Universitas Islam Bandung	10,892	18
Universitas Komputer Indonesia	9,964	17
Universitas Kristen Maranatha	9,826	17
Institut Teknologi Nasional Bandung	9,759	16
Universitas Widyatama	9,559	16
Institut Teknologi Bandung	8,561	14
Universitas Islam Nusantara	8,440	14
Universitas Katolik Parahyangan	7,822	13
Universitas Langlang Buana	4,495	8
Universitas Sangga Buana	3,527	6
STKIP Pasundan	3,033	5
Universitas Advent Indonesia	2,273	4
Sekolah Tinggi Pariwisata Bandung	2,068	3
Politeknik LP3I Bandung	2,051	3
Politeknik Kesehatan Bandung	1,938	3

3.2. Respondent characteristics

Based on the data obtained from the survey, the respondent's characteristic could be described from gender: 46% of male and 54% of women respondents. In terms of age, the respondents are 68% around 18 to 20 years old and 31% around 21 to 23 years old. Furthermore, only 2% of respondents are above 23 years old. The majority of students around 89% are in their second, fourth and sixth semester (see Table 2).

Table 2. Respondent characteristic.

	Gender		Age			Semester						
	Male	Female	<18	18-20	21-23	>23 years	2	4	6	8	9	12
Total responden	182	217	2	267	120	10	126	145	88	31	4	6
Percentage	46%	54%	1%	67%	30%	3%	32%	36%	32%	8%	1%	2%

4. Data Analysis and Discussion

4.1. Expense to purchase a credit per month

28% of students usually spent less than IDR 50.000 for phone credits, 56% of students around IDR 50.000 to 100.000, 13% of students around IDR 100.000 to 200.000, and 4% of them spent more than IDR 200.000 to buy phone credits (see Table 3). The result of this research shows that the cheaper price is to buy credits; the expense per month for the smartphone needs would be lower. Based on the research conducted

by Rosidah and Herawati [17], they claimed that most of the respondents spent around IDR 50.000 to 100.000 with 47.8%, around IDR 100.000 to 150.000 is 18.7%, below IDR 50.000 is 11.2% and more than IDR 150.000 is 22.4%.

Table 3. Expense for credit per month.

Monthly expenses per month	
<50.000	110
IDR 50 - 100K	225
IDR 100 - 200K	50
>200K	14

4.2. Smartphone brands that are owned and the reasons why they were bought

Based on the data in Table 4, apparently the biggest market among university students is dominated by Samsung with 27% users, followed by iPhone (18%), Xiaomi (17%), Oppo (17%), Asus (5%), Vivo (4%), and other brands (12%). The decisions to choose those brands are related to the desire level of student's loyalty to buy the smartphone that is produced by that brand. Additionally, the decision was influenced by consumer perception towards the brand. There may be positive and negative perceptions on the consumers towards the brand where the negative perception may lead to consumers patronizing the brands in few occasions [18]. When consumers have positive perceptions towards the brand consciously or not, they would tend to be loyal toward that brand. As previous reports stated that "brand loyalty is the consumer's conscious or unconscious decision, expressed through intention or behaviour, to repurchase a brand continually" [19]. Loyalty is the result of the interaction between a customer's relative attitude to a brand, and their repeat purchase behaviour for that brand" [18]. According to Kabiraj and Shanmugan [19], Haristiani and Firmansyah [20] and Haristiani and Aryadi [21], factors affecting youth brand choice for mobile phones purchase consist of price, quality, features, friends and family, brand image, innovative features, effective promotion, celebrity endorsement, user-friendliness, stylish appearance, and post purchase services.

Samsung users stated that the reasons they purchase Samsung are because of the comprehensive features, the low and affordable price, its popularity, has android system, outstanding quality, on demand in the market, and its comfort for playing games. This research is in line with the previous reports [22] in Nepal, which concluded that "most the Samsung mobile users are the young and middle age grouped people. They prefer phones with technological advancement and prestigious phone that comes under economic cost [23].

Meanwhile, iPhone users claimed that iPhone has outstanding quality, good, elegant, up to date, seems luxurious, has iOS and is excellent for selfie. Amount of iPhone user is less than Samsung users, which is possibly caused by the cheaper price of Samsung when compared to iPhone. These opinions are similar to the previous research [24] that concluded that Apple brand ranked higher compared to Samsung one in terms of brand equity and identity dimensions. In terms of both brands' components comparison (brand association, brand loyalty, brand awareness, perceived quality) and brand identity for each of this dimension, Apple scored consistently higher than Samsung in every dimension. The other brands' users also stated their respective opinions. Xiaomi users mentioned that their

considerations in purchasing the brand are due to the low price and that Xiaomi has high specifications. Meanwhile, Asus users thought that Asus is cheap, has a superb model and high specification and fit their needs. Fujitsu users said that the shape is attractive. Lenovo users stated that they use it for their programming needs.

According to the above data, the choice of certain smartphones brand by university students are mostly based on consumer's perception, which are related to the privilege of that brand in terms of technology that owned, features comprehensiveness, quality perception, reputation and price. Consumers of Smartphone are strongly influence by brand when it comes to choosing smartphone [25].

Table 4. Percentage of smartphone users.

Brand of smartphone	Respondents	Percentage (%)
Samsung	103	27
Iphone	68	18
Xiaomi	66	17
Asus	20	5
Fujitsu	2	1
Lenovo	10	3
Vivo	14	4
Oppo	64	17
LG	9	2
Huawei	3	1
Smartfrend	4	1
Sonny	2	1
Evercos	2	1
Nokia	4	1
Acer	2	1
Microsoft	2	1
Others	6	2

4.3. Average time when using smartphone

According to Table 5, the average time that spent by students on smartphone to have less than 2 hours is only 4%, between 2-6 hours are 27%, between 6-8 hours are 21%, between 8-10 hours are 19% and more than 10 hours are 29%.

Apparently, most of the students used smartphone for a long time every day. Students are spending an ever-increasing amount of time on their phones replying to the increased sources of communication [26-28]. The result of this research also showed the level of smartphone usage of more than 6 hours is 76%.

This result is nearly similar to the research that was conducted by previous studies [29], which concluded that duration of smart phone usage of students per day is more than 5 hours (77%) and 2 hours (27%).

Another research conducted by Kibona and Mgaya [30] stated that the average hours spent on social usage of smartphone by majority of the respondents (48%) lies on 5-7 hours per day, which is quite excessive compared to the ones spent for academic one.

Table 5. Average time when using smartphone.

The average time of smartphone using						
<2 hours	2 - 4 hour	4-6 hours	6-8 hours	8-10 hours	10-12 hours	>12 hours
17	43	65	83	74	56	61
4%	11%	16%	21%	19%	14%	15%

4.4. Social activities without using smartphone

Based on Table 6, the spending time for social activities without the smartphone is far smaller than the one with smartphone. Social activities without smartphone of less than 2 hours are 6%, between 2-4 hours are 21%, between 4-6 hours 24%, between 6-8 hours are 21% and the rest 30% that do their activities without smartphone for more than 6 hours. Students mostly used smartphone on social activities. As stated by Katz and Aakhus [31], “the spread of mobile phones is affecting people’s lives and relationships and affects how people interact during face to face or, rather and increasingly, face-to-face-to-mobile-phone-face, since people are more likely to include the mobile phone as a participant in what would otherwise be a face-to-face dyad”.

Table 6. Social activities without using smartphones.

Social activities without using smartphones						
<2 hours	2 - 4 hour	4-6 hours	6-8 hours	8-10 hours	10-12 hours	>12 hours
24	82	94	84	58	31	26
6	21	24	21	15	8	7

4.5. Interaction with parents or biological siblings without smartphone

The decrease percentage in social activities as in the previous data seems to also affect the interaction between the students and their respective family. Table 7 shows the duration of interaction that less than 2 hours are 14%; between 2 and 4 hours are 30%; between 4 and 6 hours are 22%; between 6 and 8 hours are 40%; and more than 8 hours are only around 14%. Accordingly, the students spent their time more with smartphone rather than doing face to face interaction with friends, parents or biological siblings. The use of smartphones by individuals has reduced the time they spend engaging in face-to-face communications with each other because of the time spent on the mobile [32]. Gapsiso [33] found that the use of the Internet has substantially reduced the desire of teenagers for face-to-face communication with their family members and friends.

Table 7. The interaction with parents or biological siblings without smartphone.

Duration of interaction with parents or biological siblings without smartphone in house						
<2 hours	2-4 hour	4-6 hours	6-8 hours	8-10 hours	10-12 hours	>12 hours
55	119	88	62	29	23	23
14%	30%	22%	40%	7%	6%	6%

4.6. Time that use to read the course materials

Reading interest of students was illustrated from the time they spent to read course materials. According to Table 8, 35% of students read their course materials less than 2 hours, 37% of students read are between 2-4 hours, 19% of students read between 4-6 hours and only 10% of students spare their time to read the course material for more than 6 hours.

Table 8. Time that use to read the course materials.

Time to read the course materials						
<2 hours	2 - 4 hour	4-6 hours	6-8 hours	8-10 hours	10-12 hours	>12 hours
141	146	74	21	9	6	2
35%	37%	19%	5%	2%	2%	1%

4.7. Smartphone utilisation

Based on the data shown in Tables 9 and 10, the application frequently accessed by smartphone could be ranked in order from the media that frequently used to the unfrequently ones: (1) instagram, (2) line, (3) whatsapp, (4) youtube browser and MP3, (5) game, (6) call with friends or relation, (7) read news, (8) send or read an email, (9) download videos and purchase goods online, (10) access course materials, (11) read other people's research result, and (12) access Facebook. The number of students that accessed Instagram, line, and WhatsApp is bigger compared to the access of course materials or the result of another research report.

The result of this research shows that smartphone has been used for wider functions by the students. This research is in line with the previous research [34], which claimed that "the use of smart phone has not only been limited to communicate with friends, families, business personals but has a multi-purpose feature, which includes data storage, camera, multimedia and others".

This research finding is relatively the same compared to the research conducted by Dresler-Hawke and Mansvelt [35], in which, stated that "much of the mobile phone calls by university students in New Zealand occurred to maintain friendships, keep in contact with family and most commonly, to make social arrangements, demonstrating that mobile phones facilitate rather than disrupt social communication".

The finding shows that the use of smartphone to access course materials and read others research works is in the lowest positing. This result however is slightly different with the research from Subramanian and Rajesh [29] that found 72% for downloading class materials to academic and assignments and 27% for downloading advanced techniques.

Table 9. Access amount of social media by smart phone.

	FB	WA	Line	Instagram	Youtube	Browser	Video
Achieved score	65	94	96	99	88	89	73
Maximum score	170	170	170	170	170	170	170
Relative score	0.38	0.55	0.56	0.58	0.52	0.52	0.43

Table 10. Smartphone utilisation.

	Read course materials	Read news	Read research paper	Read/send email	Phone call	Buying online goods	Mp3	Games
Achieved score	69	77	66	75	81	73	88	87
Maximum score	170	170	170	170	170	170	170	170
Relative score	0.41	0.45	0.39	0.44	0.48	0.43	0.52	0.51

4.8. User behaviour

The habit to open smartphone after waking up is quite high since 79% of respondents claimed that they always open their smartphone and 21% of respondents claimed they occasionally open it. This research percentage is higher than the research conducted by Subramanian and Rajesh [29] who mentioned that the percentage of frequency of checking smart phones while sleeping is 66%. Detailed data is shown in Table 11.

The habit to put smartphone beside the bed is also apparently high with 65%. The research done by Rosidah and Herawati [17] stated that 52.2% of people did not even put their phone one metre away when they sleep. Sarwar and Soomro [36] said that 33% of mobile workers admitted that they check their phones for email and message throughout the night. Nearly 50% of those surveyed said, they would not even think of going to bed without having their Smartphone's tucked under their pillows. The research by Alfawareh and Jusoh [37] revealed that more than 90% of respondents place the smartphone beside the bed and 61.41% of them claimed to have feelings of incompleteness whenever smartphones were not with them. The widespread information discourages such habit due to the danger of radiation and sleep quality disturbance. Meanwhile, participants who always open the notifications were 38%, and participants that occasionally open the notifications while studying were 56%. This behavior may have great effect for the student's concentration when learning the materials that was given by the lecturer in front of the class. Kibona and Mgaya [30] conducted similar research. They stated that higher learning students are addicted to using smartphone, and they cannot afford to have it switched off because they have put their mind in waiting state to receive either calls, messages, or even emails from their friends.

Table 11. Smartphone users' behaviour.

	Always		Occasionally		Never	
	Total	Percentage	Total	Percentage	Total	Percentage
Open Smartphone directly after waking up	27	79%	7	21%	0	0%
Put smartphone besides the bed	22%	65%	12	35%	0	0%
Open notifications while studying	13	38%	19	56%	2	6%

5. Conclusions

The following study revealed several findings. The average expense per month to purchase phone credit is between IDR 50.000 and 100.000. Meanwhile, the selection of brand mostly used by students is due to several factors such as its comprehensive features, low and affordable prices, popularity, simply operating system, outstanding quality, on demand in the market, and convenience for playing

games. Additionally, students spend more time to interact in their smartphone rather than engage in realistic social activity. Accordingly, the duration of interaction and communication with parents or siblings is likely to decrease due to active use of smartphone. Besides, the majority of the students spend less than 4 hours per day to read their lecturing materials. The applications that frequently accessed using smartphone are: (1) Instagram, (2) Line, (3) WhatsApp, (4) YouTube browser and MP3, and (5) games. Majority of respondents claimed that they always open their smartphone. The habit to put smartphone beside the bed is apparently high. In addition, it was found that the majority of students always open their notifications while studying.

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