UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING

COURSE: SECI2143

PROBABILITY & STATISTICAL DATA ANALYSIS

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Introduction

As we know, smartphones are currently becoming a part of a human's life and it is rare to see someone without a smartphone. A smartphone is a mobile phone with highly extended features. A common smartphone has a high-resolution touch screen display, web surfing capabilities, WiFi connectivity and also capable of accepting advanced applications. It has become one of the human needs and it seems as if they cannot live without a smartphone. Therefore, we conducted a survey to study the usage of a smartphone among Computer Science students. Our aim for this survey is to find out how students use their smartphone in daily life.

Methodology

We did this survey by using an electronic form which is Google form as our medium to collect data from Computer Science students. Then, we shared the link of this survey through Whatsapp groups that contain students from the faculty. Questions in this survey are about the usage of a smartphone among the students. Calculations such as measurement of central tendency are carried out to determine the factors that influence the usage of a smartphone among the students. At first, we thought we could just use a simple question. However, we notice that it would affect our data if we did not specify the question. Furthermore, we used quantitative data by giving out questions regarding their usage of mobile data, while for qualitative data, we gave questions on what is their favourite social media application. In addition, we used R Studio to analyze all the data. By using these methods, it helps us working our project in a faster way.

Data Analysis and Results

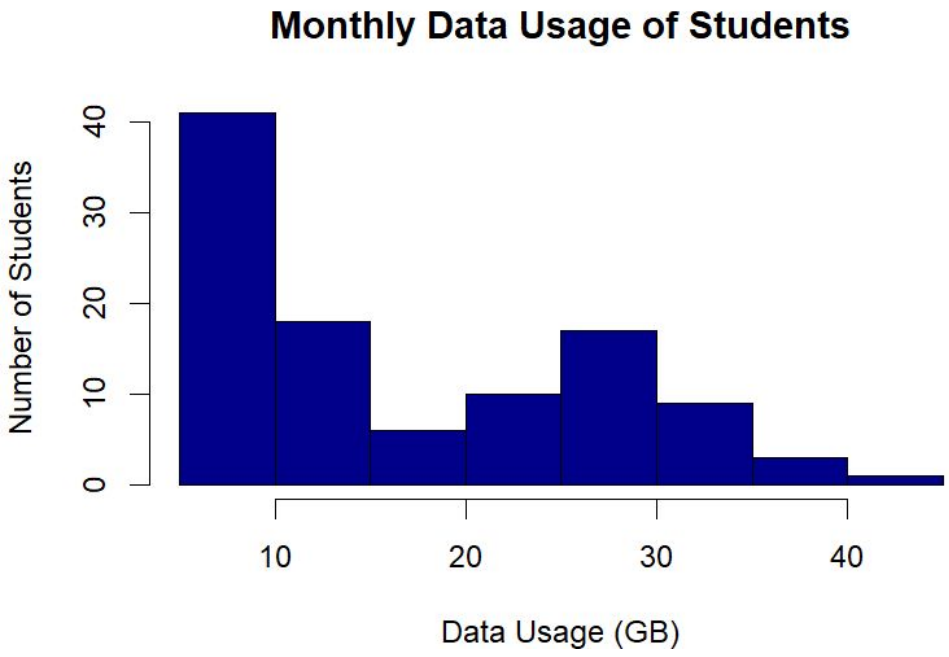

Figure 3 : Histogram

$$Mean = \frac{((41\times 7.5)+(18\times 12.5)+(6\times 17.5)+(10\times 22.5)+(17\times 27.5)+(9\times 32.5)+(3\times 37.5)+(1\times 42.5))}{105}$$

$$Mean = \frac{(307.5+225+105+225+467.5+292.5+112.5+42.5)}{105}$$

$$Mean = \frac{1777.5}{105}$$

$Mean = 16.9286$

Median class = 10 - 15, Cumulative frequency before class median=41, Median class size=5

Frequency class median=18, Lower class limit of median class=10

$$Median = 10 + \frac{\frac{105}{2} - 41}{18}(5)$$

$Median = 13.1944$

l, lower class limit of the modal class = 5

h, class size = 5

f1, frequency of the modal class = 41

f0, frequency before the modal class = 0

f2, frequency after the modal class = 18

$$Mode = 5 + 5 \times [(41 - 0) \div ((2 \times 41) - 0 - 18)]$$

$Mode = 8.2031$

Figure 3 shows a histogram of monthly data usage of students. Based on the calculation, we conclude that most of the students use not much data per month since the mean is only 16.9286. The distribution is asymmetrical and points in the positive direction which is also proved by the mean exceeding the median. Therefore, it is a positively skewed distribution. From the graph given, we can also say that most students did not stream a heavily graphical materials as we know that it is the heaviest data eater.

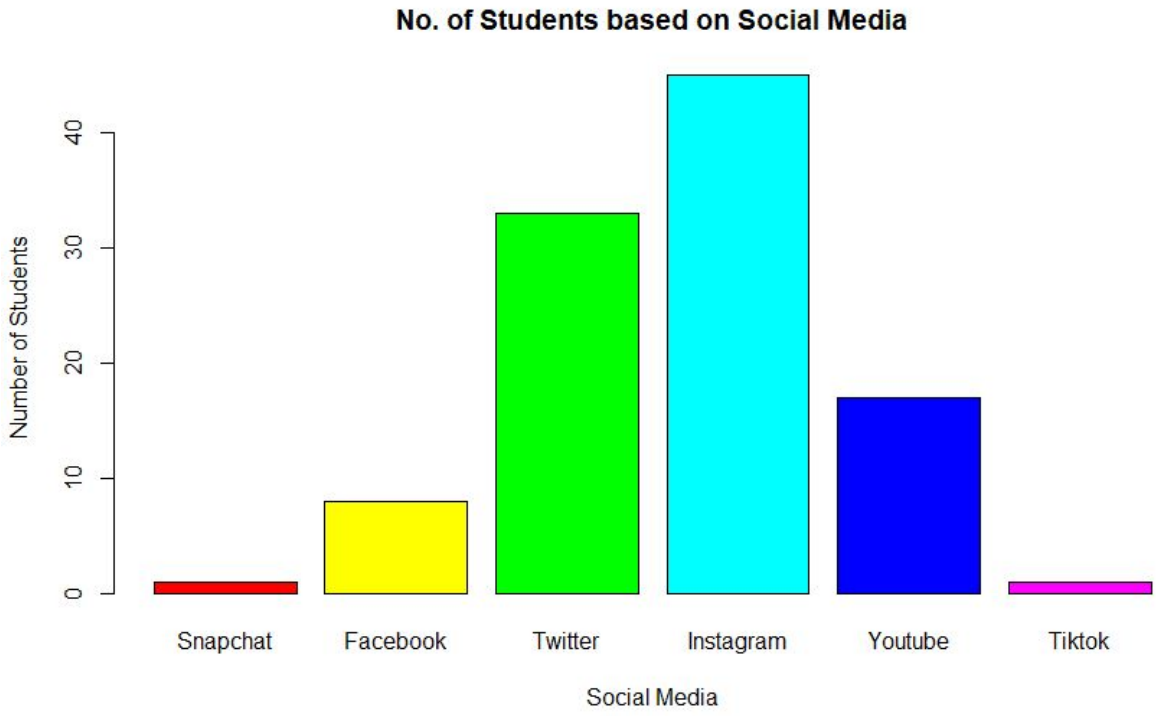

Figure 1 : Bar Chart

Figure 1 shows the types of social media used by students from the School of Computing. Based on Figure 1, we can see that the most preferred social media by students is Instagram with the value of 45 students. We can also conclude that most students from the School of Computing love visual as what Instagram is offering on their social media. Second most preferred social media by students is Twitter with the number of 33 students. Youtube is the third most preferred social media by students with a number of 17 students. The fourth most preferred social media by students is Facebook with the number of 8 students. Tiktok and Snapchat are the least preferred social media by students. Only one student prefers Tiktok and also only one student prefers Snapchat. If we take the mean of monthly data usage by students which is 16.9286, we can also conclude on why Youtube is the third most preferred social media, as we know Youtube uses a lot of data and it would not make sense if it comes first as the most preferred social media.

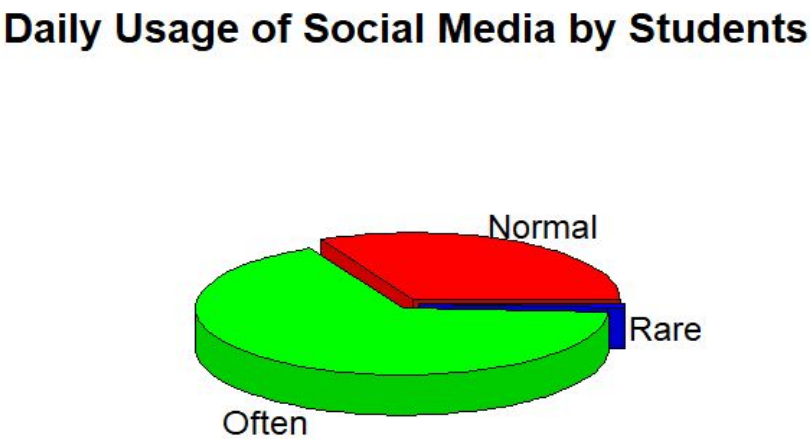

Figure 2 : Pie Chart

Figure 2 shows how often students use social media on their smartphone daily. Based on the data that we obtained from the survey, 66.67% which is 70 out of 105 students often use social media in a day. 32.38 % which is 34 out of 105 students use social media normally in a day. Only one respondent uses social media rarely in a day which takes up only 0.95% from the above pie chart. This result is the same as what we expected, it is because almost everyone has been depending on social media for their daily news resources and entertainment. However, it is still weird to see there is still a student who rarely uses their social media.

Students' Average Call Duration (minute)

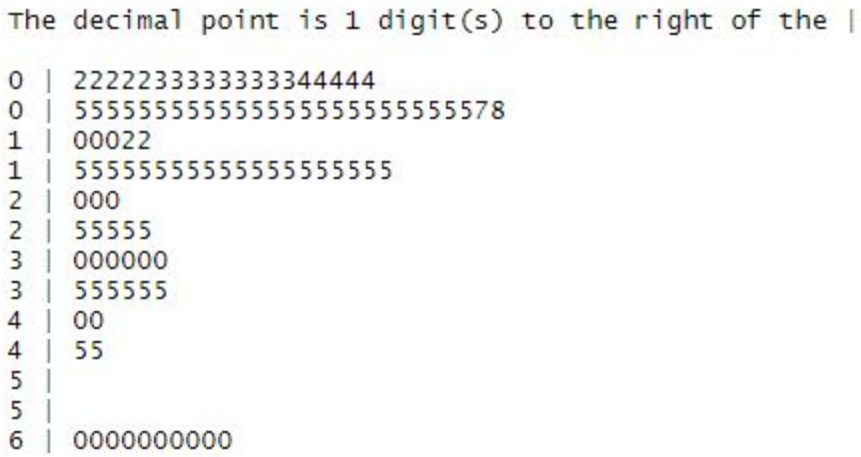

Figure 4 : Stem-and-Leaf

The stem-and-leaf shows the frequency of the average call duration of students that answered our survey. The skewness of the frequency is positively skewed. The minimum students' average call duration is 2 minutes and the maximum duration is 60 minutes. However, as you can see on the 50th minute there are no respondents spending their call in that duration. Most students that answered the survey usually spend at least 5 minutes on their every call.

Students' Preference on Watching Movies or Dramas on Their Smartphone

1 - Less likely

5 - Very likely

Students' preference on watching movies or drama on their smartphone	Frequency	Cumulative Frequency	Relative Frequency
1	8	8	0.07619
2	11	19	0.10476
3	22	41	0.20952
4	29	70	0.27619
5	35	105	0.33333
Total	**105**		

1 - Less likely

5 - Very likely

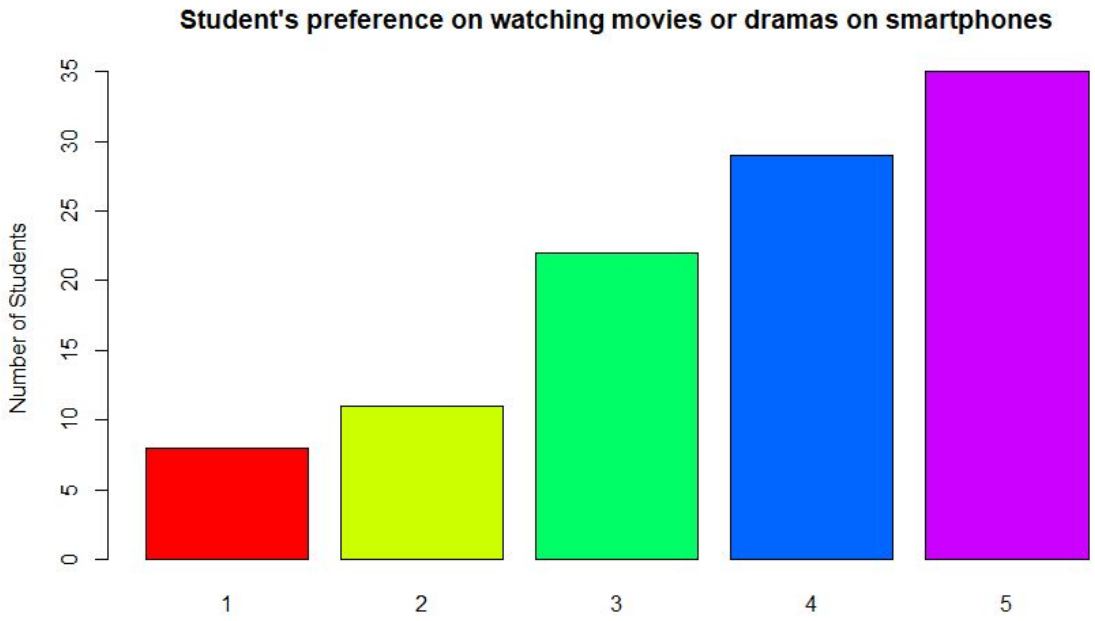

Figure 7 : Frequency Distribution

Figure 7 shows a frequency distribution of student's preference in watching movies or dramas on their smartphone. Based on the graph given, we can see that 35 students are very likely to watch a movie or drama on their smartphone. That is approximately 33.33% of all students and is the highest out of all five choices. There are a very small group of students which consist of 8 students who did not like to use their smartphone to watch drama and movies. That covered 7.61% of all students and the lowest value among all choices. We can tell that many students chose very likely because there are more than two streaming platforms such as Netflix, iflix and Viu that provide thousands of movies, tv shows and dramas as those applications can be accessed by their own smartphones.

Students' Average Call Duration

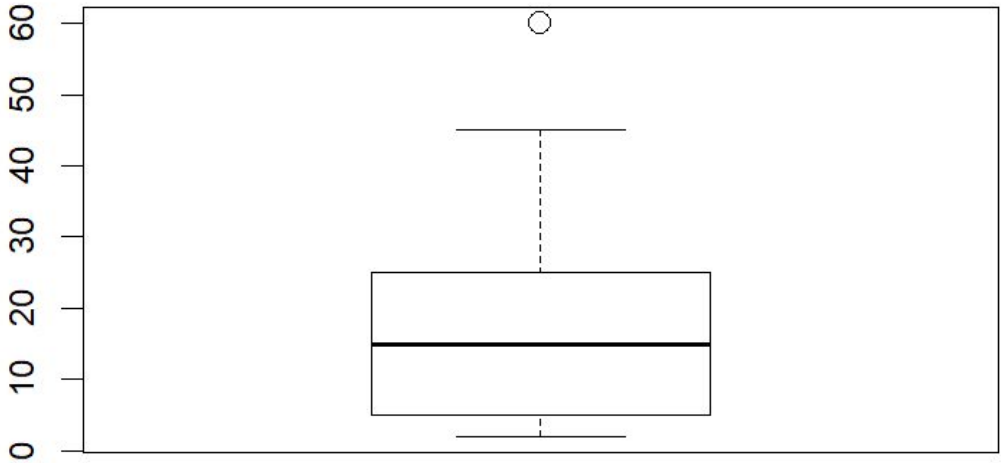

Figure 5 : Boxplot

N = 105 , p = 25
$Q1 = y[i]$
$i = \frac{p}{100}(N)$
$i = \frac{25}{100}(105) = 26.25$
≈27
$Q1 = y[27] = 5$

$N = 105$, $p = 50$
$i = \frac{50}{100}(105) = 52.5$
≈53
$Q2 = y[53] = 15$

$N = 105$, $p = 75$
$i = \frac{75}{100}(105) = 78.75$
≈79
$Q3 = y[79] = 25$

$IQR = Q3 - Q1 = 25 - 5 = 20$

$Upper\ limit = Q3 + 1.5\,(IQR) = 25 + 1.5(20) = 55$
$Lower\ limit = Q1 - 1.5(IQR) = 5 - 1.5(20) = -25$

Figure 5 shows a boxplot of the respondents' average call duration. From the responses, we obtain a minimum value which is 2 and the maximum value which is 60. Then, we calculated the first quartile, median and the third quartile from the equations above. The first quartile is 5, the median is 15 and the third quartile is 25. Then we calculated the interquartile range using the formula above. Then we obtained the interquartile range which is 20. Next, we calculated the upper limit to identify the outliers. We figure out that the upper limit is 55. Therefore, since the upper limit is 55 and the maximum value is 60, we can conclude that there is an outlier which is 60.

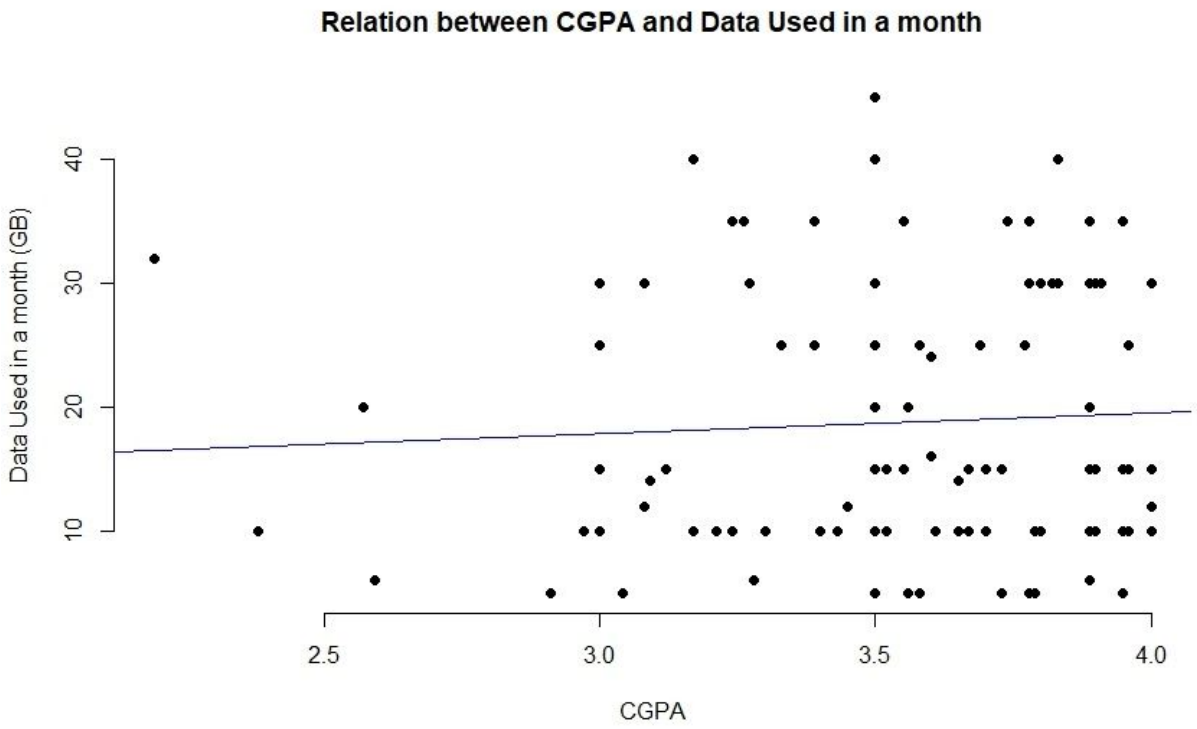

Figure 6 : Scatter plot

Data used in a month against CGPA had been plotted and the regression line had been drawn in the above scatter plot. Based on the scatter plot, we can see that most of the students who got a CGPA around 3.0 and above used less data in a month. However, students who got their CGPA below 3.0 also used less data in a month. Based on this result, we can see that students who used more or less data in a month do not affect their CGPA. From the survey, one of our respondents used the most data in a month but got a higher CGPA than other respondents that used less data in a month. This relationship does not contribute to any of the factors where their result of studies are affected by social media or calls. This shows that the usage of data will not affect someone's studies and their CGPA results. Thus, it mostly depends on the person themselves, whether or not they know how to manage their time to improve their studies to get excellent results on their CGPA.

Conclusion

Based on our analysis, all respondents use social media on their smartphone. Most of the students often use social media on their smartphone daily. Based on the responses, Instagram is the most preferred social media by students. Besides, the data distribution of the monthly data usage of students is asymmetrical and positively skewed to the right direction. This is because the value of the mean is greater than the median value. Moreover, the highest value of students' average call duration is 60 minutes meanwhile the lowest value is only 2 minutes. In addition, 35 out of 105 students are very likely to watch movies or dramas on their smartphone but only 19 respondents are less likely to use their smartphone to watch movies or dramas. Based on the scatter plot of the relation between CGPA and monthly data usage of students, we can conclude that their CGPA result will not be affected by the amount of data they used in a month. In conclusion, all the data that we got from the survey can be proved that their daily life and their results will not be affected by any factors.

Appendix

Survey on The Usage of A Smartphone Among Students

Assalamualaikum and greetings to all Computer Science students, we are from SECJ First Year student.
We are currently conducting a survey on the usage of a smartphone user among Computer Science students.

As we know, smartphone is currently becoming a part of a human's life and it is rare to see someone without a smartphone. It has become one of the human needs and it seems as if they cannot live without a smartphone.

Therefore, our aim for this survey is to find out how people use their smartphone in daily life.

Thank you for your time.
* Required

1. Gender *

   Mark only one oval.

   - ◯ Male
   - ◯ Female

2. Year *

   Mark only one oval.

   - ◯ First Year
   - ◯ Second Year
   - ◯ Third Year
   - ◯ Fourth Year

3. Programme *

Mark only one oval.

- ◯ SECJ/SCSJ
- ◯ SECV/SCSV
- ◯ SECB/SCSB
- ◯ SECR/SCSR
- ◯ SECP/SCSP

4. CGPA *

_____

5. What smartphone brand do you use? *

Mark only one oval.

- ◯ Apple
- ◯ Samsung
- ◯ Huawei
- ◯ Xiaomi
- ◯ Vivo
- ◯ Other: _____

6. Do you pay upfront or monthly? *

Mark only one oval.

- ◯ Upfront
- ◯ Monthly

7. What Telco do you use? *

Mark only one oval.

- ◯ Umobile
- ◯ Digi
- ◯ Maxis
- ◯ Celcom
- ◯ Other: _____

8. Where do you buy your smartphone? *

Mark only one oval.

- ◯ Walk-in
- ◯ Through online shopping

Almost there!

9. How much do you pay for your smartphone? (RM) *

Mark only one oval.

- ◯ 0-999
- ◯ 1000-1999
- ◯ 2000-2999
- ◯ 3000-3999
- ◯ 4000-4999
- ◯ 5000 and above

10. How much data do you use on your smartphone monthly? (GB) *

Example : 15

_____

11. How many calls do you receive in a day? *

Mark only one oval.

- ◯ 0-1
- ◯ 2-3
- ◯ 4-5
- ◯ 6 and above

12. How long do you usually spend on a call? (minute) *

Example : 10

_____

13. What social media do you prefer? *

Mark only one oval.

- ◯ Instagram
- ◯ Twitter
- ◯ Facebook
- ◯ Youtube
- ◯ Tiktok
- ◯ Snapchat

14. How often do you use social media from your smartphone in a day? *

Mark only one oval.

- ◯ Rarely
- ◯ Normal
- ◯ Often

15. How old is your smartphone?(year) *

Mark only one oval.

- ◯ 0-1
- ◯ 1-2
- ◯ 2-3
- ◯ 3 and above

Last! :)

16. Do you agree smartphone gives many benefits in your life? *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree

17. How satisfied are you with your smartphone? *

Mark only one oval.

	1	2	3	4	5	
Very unsatisfied	◯	◯	◯	◯	◯	Very satisfied

18. How satisfied are you with your Telco? *

Mark only one oval.

	1	2	3	4	5	
Very unsatisfied	◯	◯	◯	◯	◯	Very satisfied

19. How likely are you watch movies or drama on your smartphone? *

Mark only one oval.

	1	2	3	4	5	
Less likely	◯	◯	◯	◯	◯	Very likely

20. Do you agree using smartphone in a class is allowed? *

Mark only one oval.

	1	2	3	4	5	
Strongly disagree	◯	◯	◯	◯	◯	Strongly agree