UTM

UNIVERSITI TEKNOLOGI MALAYSIA

SCHOOL OF COMPUTING
SEMESTER II 2020/2021

SECI2143 PROBABILITY & STATISTICAL DATA ANALYSIS

SECTION: 07

LECTURER: DR. NIES HUI WEN

Group 6: Sisthreehood

Project Title: The Use of E-commerce on Online Shopping

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1.0 INTRODUCTION

E-commerce is a business activity that involves buying and selling items through the Internet (Bloomenthal, 2020). This form of online business is becoming widely known as an emerging platform, especially in the midst of the COVID-19 pandemic that pushes more and more people to rely on e-commerce services. Moreover, this increasing demand on e-commerce services also encouraged retailers to shift to this new platform in order to reach out to more customers and gain business profits, even after the pandemic is over. Thus, we began to be intrigued by this emerging platform and came out with a survey entitled **"The Use of E-commerce on Online Shopping"** to study the popularity of online shopping among people and their frequency in using this platform.

2.0 DATA COLLECTION

Respondents in this study were randomly selected from all students at the University of Technology Malaysia and citizens of Malaysia. The method used to collect all data is by sharing survey forms via social media with various groups. We shared a Google form link that we have prepared to distribute the form, which contains our questions that respondents need to answer regarding our case study. For creating graphs, charts, and all graphical representations, we used Microsoft Excel to produce it. Below is the data description on each parameter.

Parameter	Description	Answer
1. Gender	Gender of the respondents	• Male • Female
2. Age	Age of respondents	(metric value)
3. Online shopping	Whether respondents online shopping before	• Yes • No
4. Apps	Online shopping apps	• Lazada • Shopee • Zalora • Taobao • Others
5. Categories	Categories in online shopping	• Health & Beauty • Electronic Devices & Accessories • Fashion • Sports & Lifestyle • Digital Goods • Others
6. Online shopping (per month)	Frequency of online shopping per month	• 0-2 • 3-5 • 6-8 • 9-11 • >11
7. Online purchase (per month)	Respondents online purchase in a month	• RM 0-RM 49 • RM 50-RM 99 • RM 100-RM 149 • RM 150-RM 199 • RM 200-RM 249 • >RM250
8. Payment method	Common online payment method	• Credit/ Debit Card • Touch'n Go eWallet • Online Banking • Boost Wallet • Others
9. Frequency of online shopping	Frequency of online shopping before and after covid-19	• Extremely frequent • Quite frequent • Moderate • Less frequent • Extremely not frequent
10. Preferences	Preferences of online shopping	• Extremely preferable • Preferable • Moderate • Unpreferable • Extremely unpreferable

Table 1: Data description on parameter

3.0 DATA ANALYSIS AND RESULTS

3.1 PIE CHART FOR GENDER

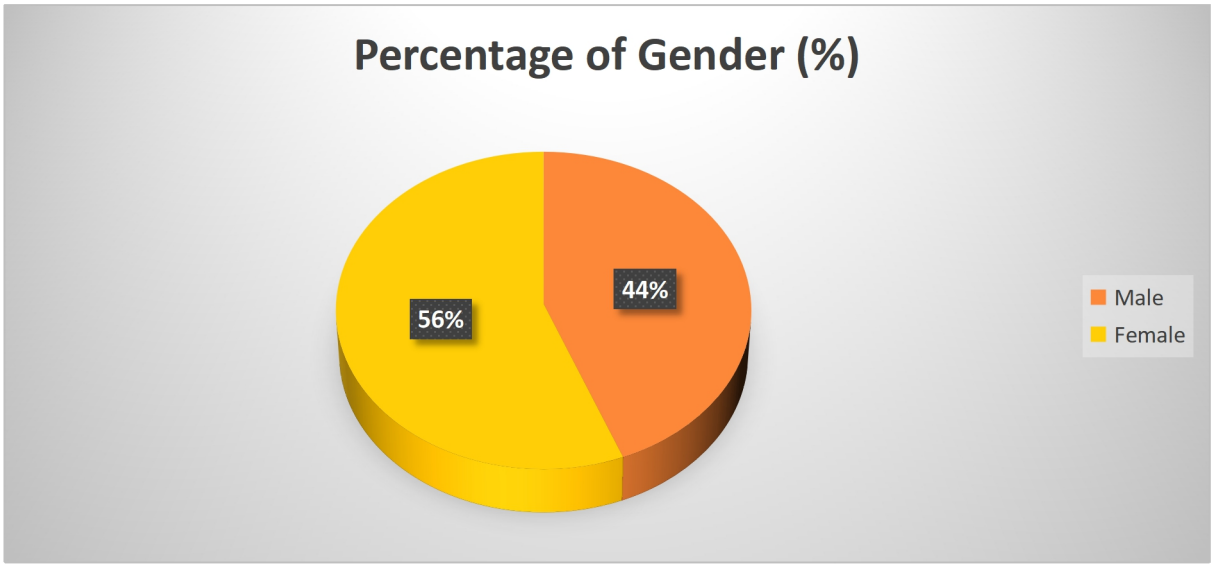

Figure 1: Percentage of Gender

Gender	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for gender (%)
Male	66	66	0.44	0.44	44.00
Female	84	150	0.56	1.00	56.00
Total	**150**		**1.00**		**100.00**

Table 2: Data for Gender

The pie chart in Figure 1 shows the responses of 150 respondents. We can observe that male only consists of a percentage of 44% with 66 respondents, while female are 12% more than male with a total of 84 respondents (56%). Thus, from this data, it can be concluded that this questionnaire was filled mostly by female.

3.2 HISTROGRAM AND SKELETAL BOX PLOT OF AGE

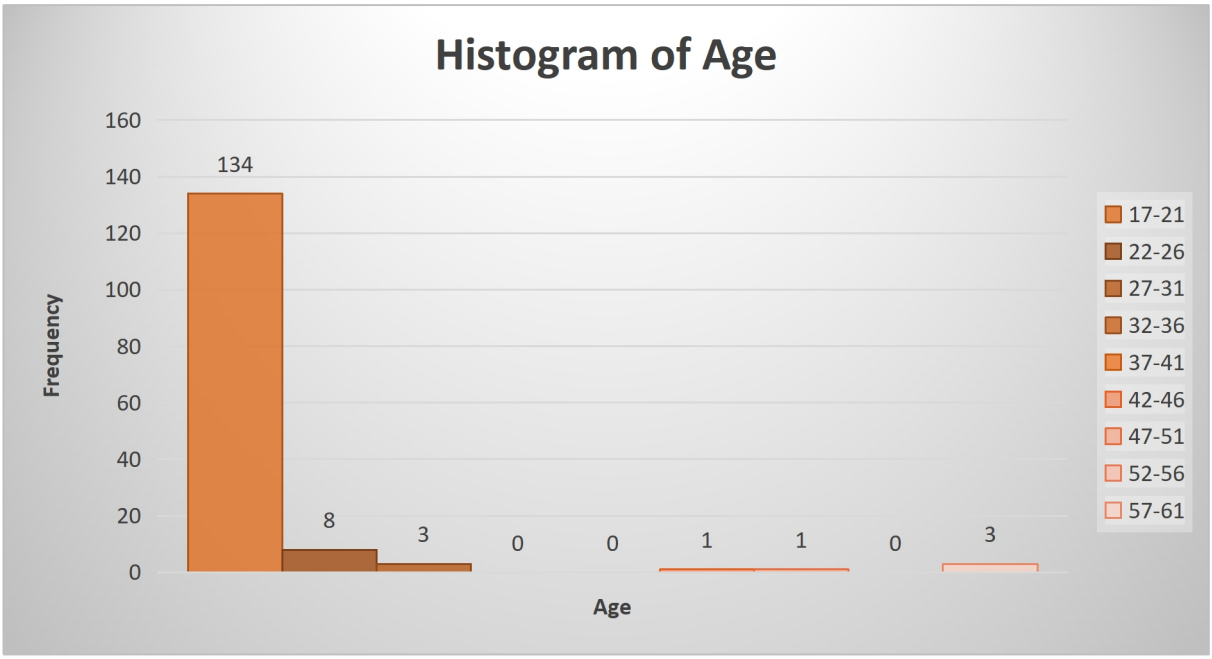

Figure 2: Histogram of Age

Age	Lower boundary	Upper boundary	Mid Point, x	Frequency, f	fx	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	$f(x-\bar{x})^2$	$f(x-\bar{x})^3$	$f(x-\bar{x})^4$	Percentage of Age (%)
17-21	16.5	21.5	19	134	2546	134	0.89	0.89	357.48	-583.89	953.68	89.33
22-26	21.5	26.5	24	8	192	142	0.05	0.95	90.68	305.27	1027.76	5.33
27-31	26.5	31.5	29	3	87	145	0.02	0.97	210.00	1757.03	14700.47	2.00
32-36	31.5	36.5	34	0	0	145	0.00	0.97	0.00	0.00	0.00	0.00
37-41	36.5	41.5	39	0	0	145	0.00	0.97	0.00	0.00	0.00	0.00
42-46	41.5	46.5	44	1	44	146	0.01	0.97	546.00	12758.23	298117.21	0.67
47-51	46.5	51.5	49	1	49	147	0.01	0.98	804.67	22825.74	647490.23	0.67
52-56	51.5	56.5	54	0	0	147	0.00	0.98	0.00	0.00	0.00	0.00
57-61	56.5	61.5	59	3	177	150	0.02	1.00	4416.00	169427.33	6500361.81	2.00
Total				**150**	**3095**		**1.00**		**6424.83**	**206489.71**	**7462651.17**	**100.00**

Table 3: Data for Age

Mean	20.63
Median	19.30
Mode	19.08
Variance	43.12
Standard Deviation	6.57
Skewness	4.89
Kurtosis	26.94

Table 4: Analysis from Age data

Based on the "Histogram of Age" diagram, we have accumulated a total 150 respondents who participated in this survey. The horizontal axis represents the number of people for each age group and the vertical axis represents percentage. Besides, the difference in the colour of the bars indicates each age group. Out of 150 respondents, 134 respondents (89.33%) aged 17-21

years old followed by 8 respondents (5.33%) aged 22-26 years old, 3 respondents aged 27-31 years old with 2.00%. Furthermore, the age groups with the range 42-46 years old and 47-51 years old each has one respondent (0.67%). It appears that there are age groups with 0 respondent (0.00%), which means there is no respondent that has answered our survey belongs to these age groups, namely at the age of 32-36 years old, 37-41 years old and 52-56 years old. We can compare from the percentages of this data, the highest percentage is swaddled by respondents aged 17-21 years, while respondents aged 32 years and over tend to rarely shop online. The skewness and kurtosis of the histogram are positive skewed and leptokurtic which are 4.89 and 26.94. Thus, it can be concluded that our survey has been filled by mostly young people.

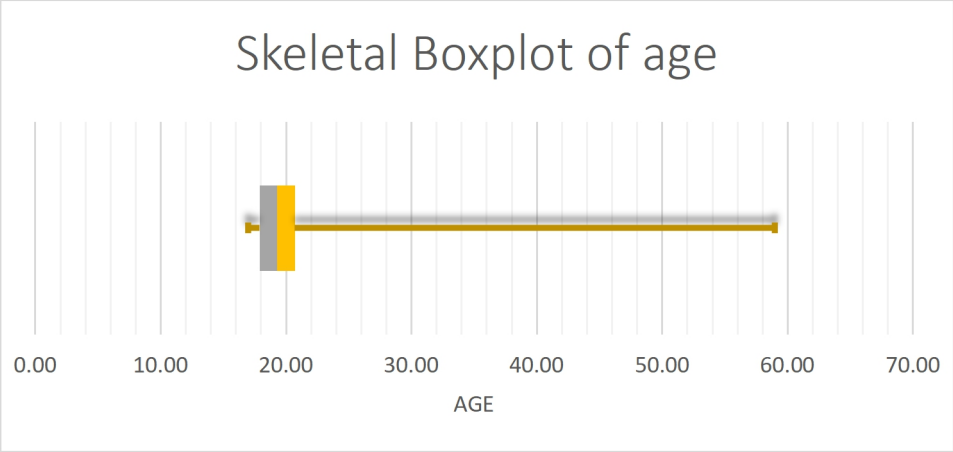

Figure 3: Skeletal boxplot of Age

Age		Differences
Min	17.00	17.00
Q1	17.90	0.90
Median	19.30	1.40
Q3	20.70	1.40
Max	59.00	38.30

Table 5: Analysis from skeletal boxplot Age

We can find some information from the skeletal boxplot above, such as the smallest observed value (Min), the quartile and the largest observed value (Max). Meanwhile, the horizontal axis indicates the age. The box is drawn from first quartile (Q1) to third quartile (Q3), the vertical line that goes through the box is Median (Q2). The first quartile (Q1) has an age of 17.90 years, followed by Median (Q2) which has an of 19.30 years and the third quartile (Q3) with an age of 20.70 years. For the smallest observed age (minimum value) is 17.00 years old and the largest age in observation is 59.00 years old. The range of the age is 42.00 years old.

3.3 BAR CHART OF SHOPPING ONLINE

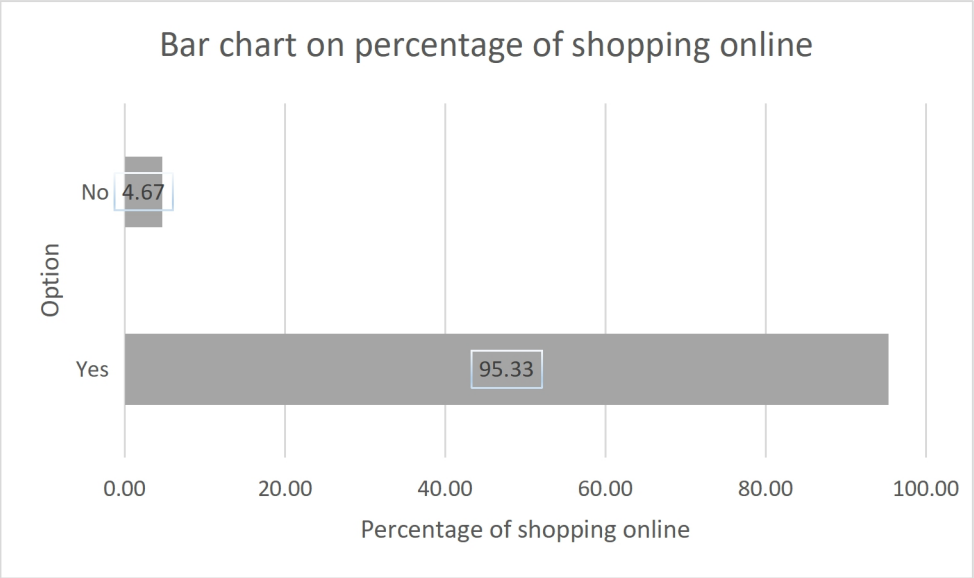

Figure 4: Bar chart on Percentage of Shopping Online

Option	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Shopping Online (%)
Yes	143	143	0.95	0.95	95.33
No	7	150	0.05	1.00	4.67
Total	**150**		**1.00**		**100.00**

Table 6: Data for Percentage of Shopping Online

Based on the data collection that we have done, there are two choices, namely "Yes" and "No", with 143 respondents (95.33%) have chosen "Yes" while for the option "No" have chosen by 7 respondents (4.67%), which means these respondents have never shop online before. The mean obtained after calculating from this data is 75.00. Data were collected randomly and not based on differences in age and gender. Thus, it can be concluded that there are still very few respondents do not use e-commerce sites as platforms for buying goods.

3.4 COMPARATIVE BAR CHART OF GENDER VS OPTION

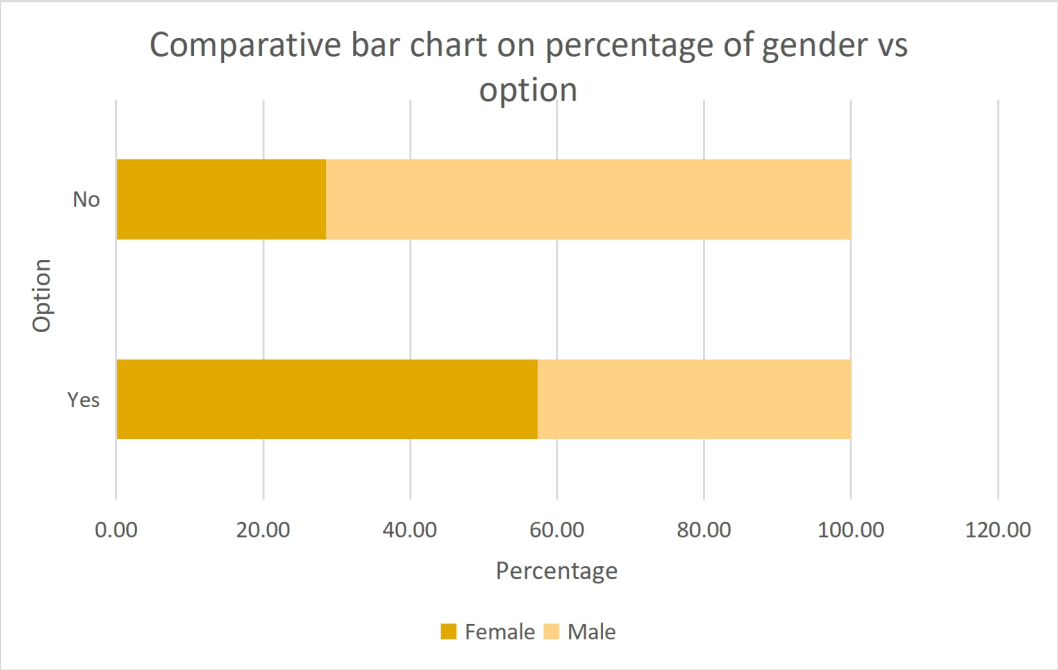

Figure 5: Comparative bar chart on Percentage of Gender vs Option

Gender	Option		Cumulative Frequency (for Male and Female)		Relative Frequency		Cumulative Relative Frequency		Percentage for Options Chose by Female or Male (%)	
	Yes	No	Yes	No	Yes	No	Yes	No	Yes	No
Male	61	5	61	5	0.43	0.71	0.43	0.71	42.66	71.43
Female	82	2	143	7	0.57	0.29	1.00	1.00	57.34	28.57
Total	**143**	**7**			**1.00**	**1.00**			**100.00**	**100.00**

Table 7: Data for Gender vs Option

The comparative bar chart of gender vs percentage of options shows the overall options for those who have or have never shopping online. From the results of the grouping, the number of respondents who answered "Yes" are 143 respondents. Out of the 143 respondents, 82 respondents (57.34%) are female and 61 respondents (42.66%) are male. Whereas for the "No" option there are only 7 respondents, with 2 respondents (28.57%) are female and a total of 5 respondents (71.43%) are male. Therefore, we can conclude that female use e-commerce sites to shop online more than male.

3.5 PIE CHART OF APPS USED

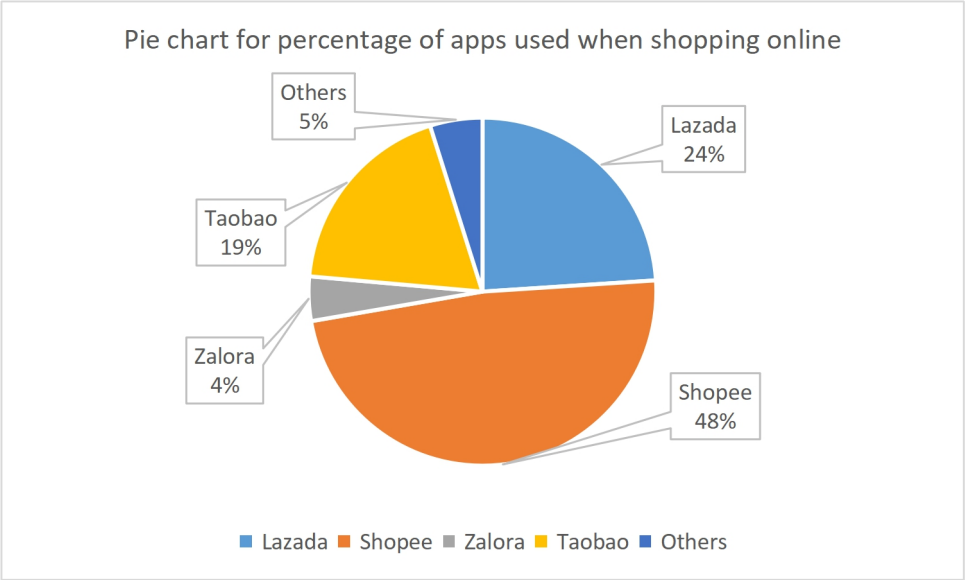

Figure 6: Pie chart for Frequency of Apps Used when Shopping Online

Apps	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Apps Used (%)
Lazada	64	64	0.24	0.24	23.97
Shopee	129	193	0.48	0.72	48.31
Zalora	11	204	0.04	0.76	4.12
Taobao	50	254	0.19	0.95	18.73
Others	13	267	0.05	1.00	4.87
Total	**267**		**1.00**		**100.00**

Table 8: Data for Apps Used when Shopping Online

From the pie chart in Figure 6, Shopee app has accumulated 48.31% which has the highest percentage among all the Apps used when shopping online. The second highest percentage is 23.97%, with 64 out of 267 responses choosing Lazada app. Next, we have 50 responses (18.73%) that chose Taobao app. We can also observe that the Apps that are unlisted, in which we included them in the category named Others has a total 4.87%. Hence, this shows there is a slight difference between Zalora app which only has 4.12%. The mean of this data is 53.40. Since Zalora app is the has the lowest percentage among all the Apps, we can conclude that Zalora app is the least frequently used App when shopping online and Shopee is the common apps that usually used by most of the respondents.

3.6 BAR CHART ON CATEGORY OF PRODUCTS

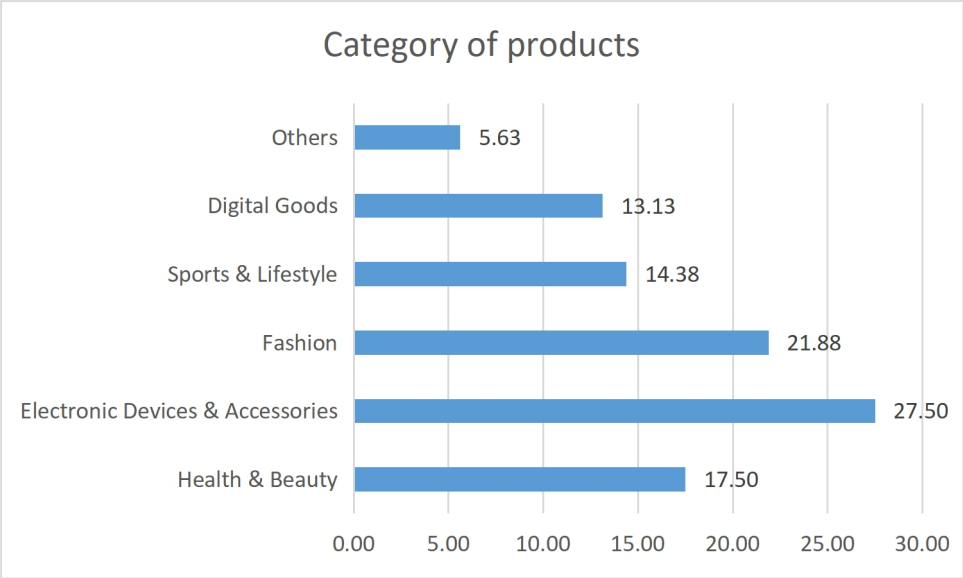

Figure 7: Bar chart on Category of Products

Category of Products	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Category of Products (%)
Health & Beauty	56	56	0.18	0.18	17.50
Electronic Devices & Accessories	88	144	0.28	0.45	27.50
Fashion	70	214	0.22	0.67	21.88
Sports & Lifestyle	46	260	0.14	0.81	14.38
Digital Goods	42	302	0.13	0.94	13.13
Others	18	320	0.06	1.00	5.63
Total	**320**		**1.00**		**100.00**

Table 9: Data for Category of Products

Bar chart in Figure 7 survey was conducted and have collected a total of 320 responses on category of product. Out of the 320 responses, Electronic Devices and Accessories is the most famous category of products to be purchased online as it has 27.50%, followed by Fashion which has 21.88%. On the contrary, it is shown that the category of Others has the lowest percentage, which is 5.63%. The category for Sports and Lifestyle (14.38%) is slightly higher than Digital Goods (13.13%) with only 1.25% difference. The mean of the category of the products is 53.33. Hence, we can conclude that most respondents opt to buy Electronic Devices and Accessories via e-commerce sites followed by the Fashion category.

3.7 BAR CHART ON FREQURNCY TO SHOP ONLINE

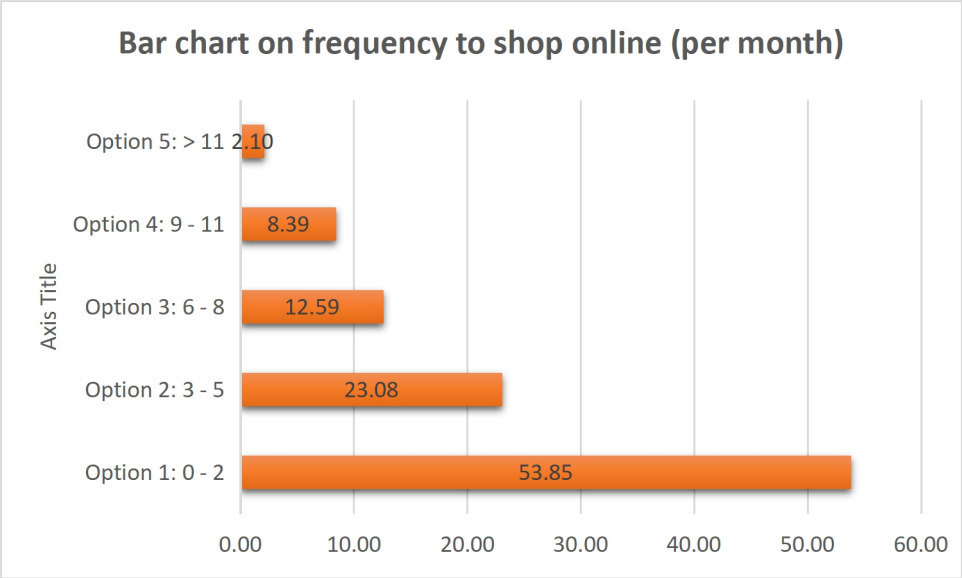

Figure 8: Bar chart on Frequency to Shop Online (per month)

Frequency To Shop Online (per month)	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Option to Shop Online (%)
Option 1: 0 - 2	77	77	0.54	0.54	53.85
Option 2: 3 - 5	33	110	0.23	0.77	23.08
Option 3: 6 - 8	18	128	0.13	0.90	12.59
Option 4: 9 - 11	12	140	0.08	0.98	8.39
Option 5: > 11	3	143	0.02	1.00	2.10
Total	**143**		**1.00**		**100.00**

Table 10: Data for Frequency to Shop Online (per month)

Bar chart in Figure 8 shows the frequency to shop online per month. According to the bar chart, we can notice a trend from Option 1 to Option 5, in which the percentage is decreasing from the highest to lowest. 77 respondents (53.85%) chose Option 1 as they only shop online 0-2 times per month, followed by Option 2 which has chosen by 33 respondents (23.08%). After that we can notice Option 3 has accumulated 18 respondents (12.59%) and Option 4 having 12 respondents (8.39%) go online shopping 9-11 times per month. However, Option 5 is the least option that is chosen by the respondents, with only 3 respondents (2.10%) shop online more than 11 times within a month. The mean of this data is 28.60. Option 1 is the median and mode of this data. Thus, we can conclude that the majority of respondents shop online 0-2 times in a month.

3.8 BAR CHART ON AMOUNT OF MONEY SPENT IN ONLINE SHOPPING

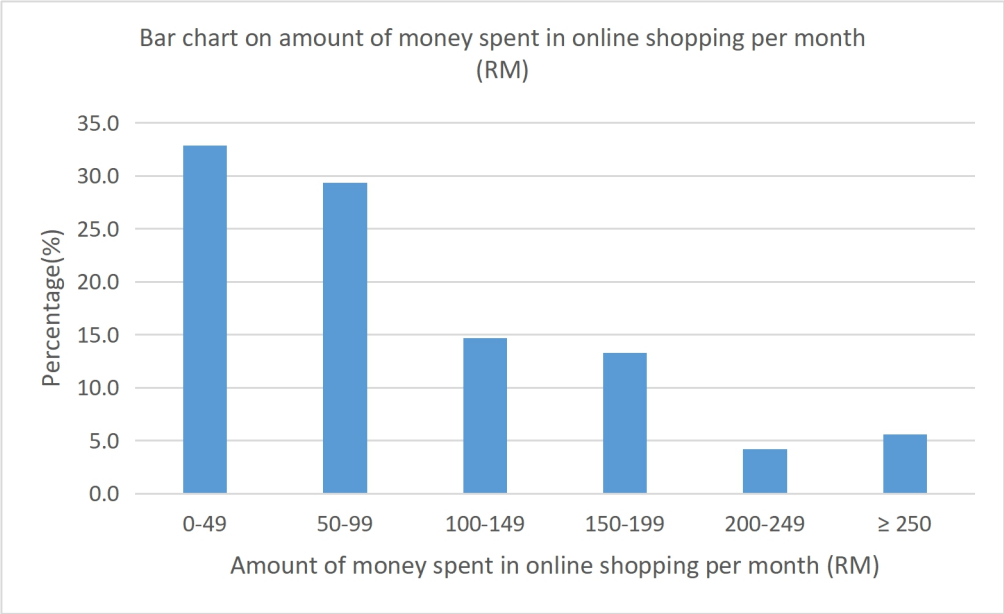

Figure 9: Bar chart on Amount of Money Spent in Oline Shopping (per month)

Amount of money spent per month (RM)	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Amount of Money Spent (%)
0-49	47	47	0.33	0.329	32.9
50-99	42	89	0.29	0.622	29.4
100-149	21	110	0.15	0.769	14.7
150-199	19	129	0.13	0.902	13.3
200-249	6	135	0.04	0.944	4.2
≥ 250	8	143	0.06	1.000	5.6
Total	**143**		**1.00**		**100.0**

Table 11: Data for Amount of Money Spent in Oline Shopping (per month)

The bar chart in Figure 9 shows a total of 143 responses for the percentage of spending on online shopping in a month. The spending on online shopping between RM0-RM49 has the highest percentage which is 32.9% (47 respondents). The second highest is the range from RM50-RM99 which consists of 42 respondents (29.4%) and followed by 14.7% (21 respondents) which spend between RM100-RM149 on online shopping in a month. Besides, we observe that there are 19 respondents (13.3%) spend RM150-RM199 for online shopping in a month. Meanwhile, 8 respondents (5.6%) have spent greater than or equal to RM250 from online shopping. The lowest percentage is the amount between RM200-RM249 as there are only 6 respondents (4.2%) spending that much money shopping online. The mean of this data is 23.83. We can conclude that most respondents spend RM0-RM49 on online shopping goods followed by spending RM50-RM99 in a month.

3.9 PIE CHART ON PAYMENT METHODS

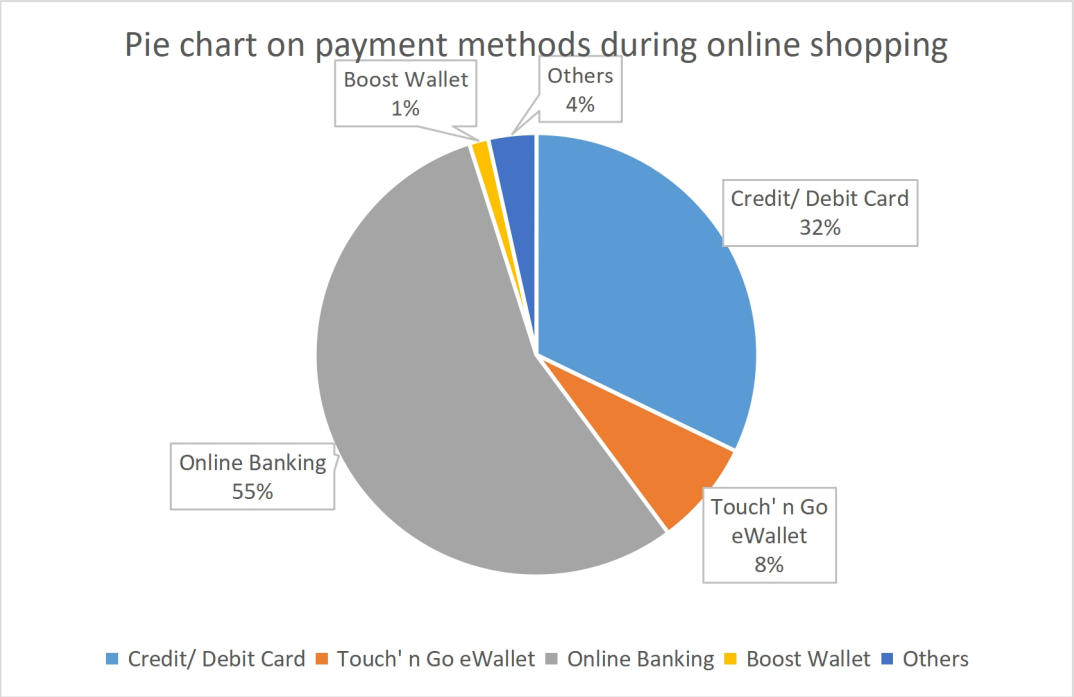

Figure 10: Pie chart on Payment Methods during Online Shopping

Payment method	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Each Payment Method (%)
Credit/ Debit Card	46	46	0.322	0.322	32.17
Touch' n Go eWallet	11	57	0.077	0.399	7.69
Online Banking	79	136	0.552	0.951	55.24
Boost Wallet	2	138	0.014	0.965	1.40
Others	5	143	0.035	1.000	3.50
Total	**143**		**1.000**		**100.00**

Table 12: Data for Payment Methods during Online Shopping

Figure 10 is a pie chart that describes the payment methods answered by 143 respondents. Based on the pie chart, online banking is the most famous payment method as there are 79 respondents (55.24%) prefer to use it when online shopping. Next, we have 46 respondents (32.17%) chose to pay credit/debit card. Besides, 11 respondents (7.69%) prefer to use Touch'n Go eWallet as their payment method when buying online products followed by Others, a category that includes all unlisted payment methods, which has only 5 respondents (3.50%). The payment method that is chosen by the least number of respondents is Boost Wallet which has 1.40%. The mean of payment methods is 28.60. Hence, we can conclude that most respondents would choose to pay using online banking when shopping online.

3.10 BAR CHART FOR LEVEL OF FREQUENT

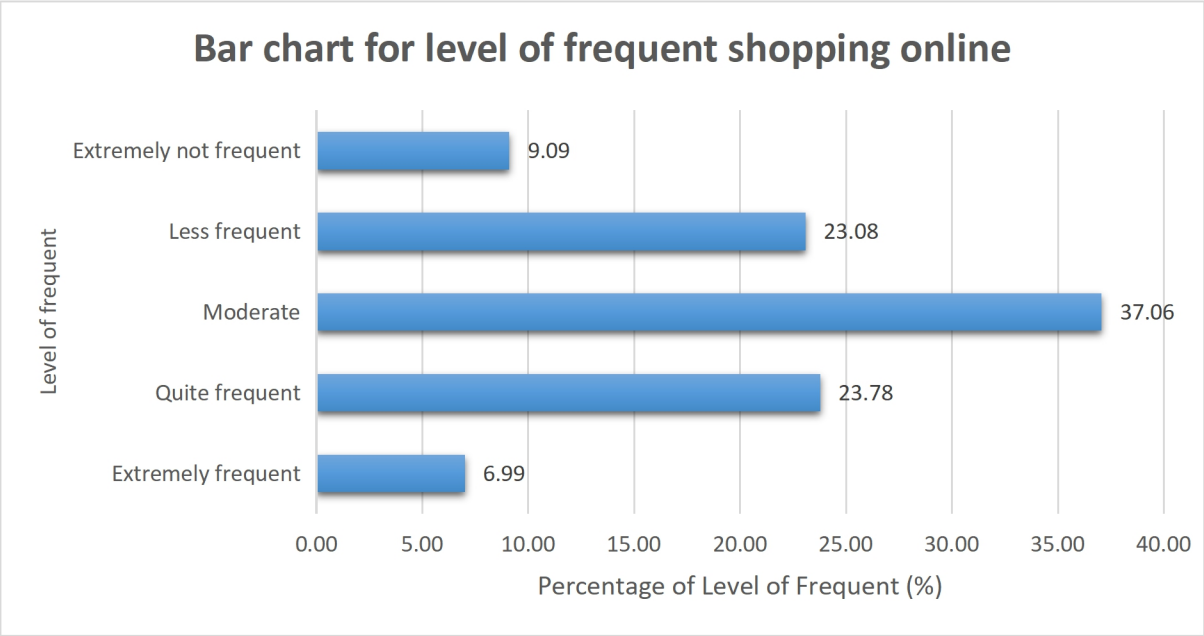

Figure 11: Bar chart for Level of Frequent Shopping Online

Level of Frequent	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Level of Frequent (%)
Extremely frequent	10	10	0.070	0.070	6.99
Quite frequent	34	44	0.238	0.308	23.78
Moderate	53	97	0.371	0.678	37.06
Less frequent	33	130	0.231	0.909	23.08
Extremely not frequent	13	143	0.091	1.000	9.09
Total	**143**		**1.000**		**100.00**

Table 13: Data forLevel of Frequent Shopping Online

From Figure 11 bar chart, we observe that there are total 143 responses collected. The bar chart also shows the highest percentage of level of frequent which is the Moderate level that consists of 53 respondents (37.06%). The second highest percentage is Quite Frequent that consists of 34 respondents (23.78%). This is followed closely by Less Frequent level which has 33 respondents (23.08%). Meanwhile, there are 13 respondents (9.09%) who are Extremely Not Frequent in shopping online. On the contrary, 10 respondents (6.99%) answered that they are Extremely Frequent to shopping online. The level of frequent has the mean of 28.60. Thus, most respondents shop online Moderately and not Extremely Frequent.

3.11 BAR CHART FOR PREFERENCES

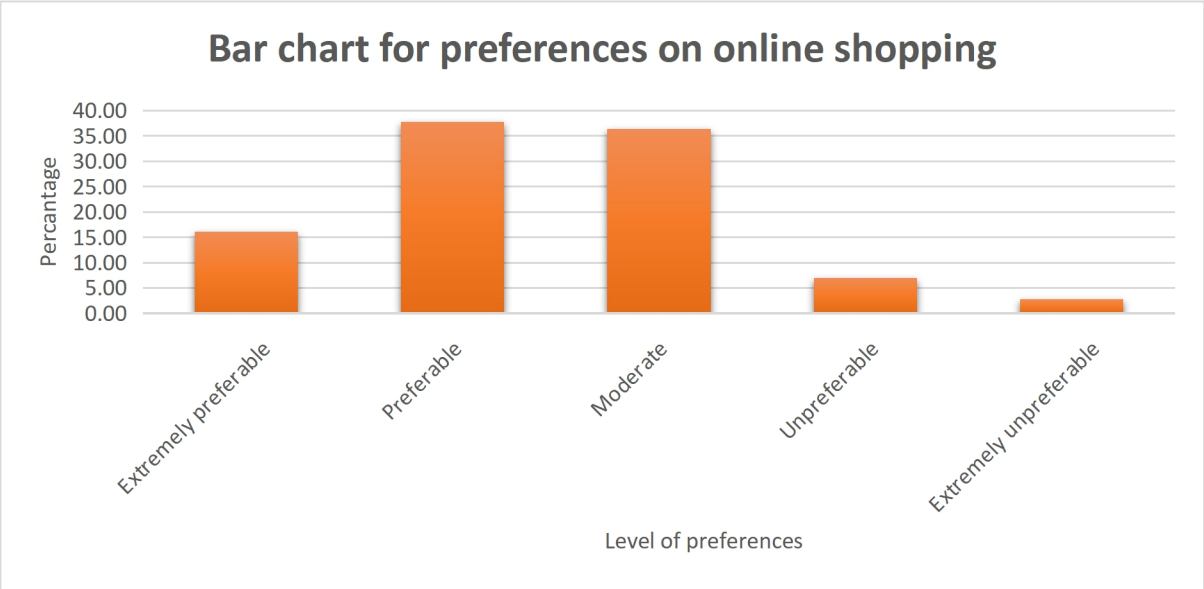

Figure 12: Bar chart for Preferences on Online Shopping

Level of Preferences	Frequency	Cumulative Frequency	Relative Frequency	Cumulative Relative Frequency	Percentage for Level of Preferences(%)
Extremely preferable	23	23	0.16	0.16	16.08
Preferable	54	77	0.38	0.54	37.76
Moderate	52	129	0.36	0.90	36.36
Unpreferable	10	139	0.07	0.97	6.99
Extremely unpreferable	4	143	0.03	1.00	2.80
Total	**143**		**1.00**		**100.00**

Table 14: Data forPreferences on Online Shopping

In Figure 12 shows the level of preferences on online shopping from 143 responses collected in this survey. According to the bar chart, we can observe that 54 respondents (37.76%) have chosen Preferable when it comes to online shopping. This is followed by 52 respondents (36.36%) chose Moderate as their level of preferences on online shopping. 23 respondents (16.08%) are Extremely Preferable with shopping online while 10 respondents (6.99%) are Unpreferable with online shopping. Meanwhile, the level Extremely Unpreferable has the least number of responses, which only has 4 respondents (2.80%). The mean of level preferences is 28.60. Therefore, most respondents are Moderately prefer to shop online and not too extreme.

4.0 CONCLUSION

From the survey that has been conducted and the results of data processing and statistical evidence, several conclusions are obtained. Firstly, online shopping using e-commerce sites is increasingly in demand by consumers, almost everyone who filled out the survey said "yes" to shopping online. Secondly, online shopping is in demand by both women and men. Judging from the survey results, the comparison of the two is insignificant, with teenagers taking the first position in the use of online shopping. Thirdly, most people tend to visit e-commerce sites to buy electronic devices, followed by clothing as well as health and beauty products. Fourth, out of many e-commerce companies in Malaysia, the three highest positions in terms of popularity are occupied by Shopee, Lazada, and Taobao. Apart from that, most of the consumers are using online banking for payments. After completing the assignment given by our lecturer, we have grasped a better understanding about data collection and analysis and able to practice them in real life. By learning PSDA, we have now learned how to calculate the frequencies, percentages, mean and even the quartile using Microsoft Excel.

5.0 Appendix

5.1 Google form

The Use of E-commerce on Online Shopping

Hello, we are students from Universiti Teknologi Malaysia (UTM) Group 6 - SECI2143 PROBABILITY & STATISTICAL DATA ANALYSIS (Section 07) would like to conduct a survey on the title as mentioned above.

The purpose of this survey is to collect sample data about the use of e-commerce for online shopping. Then, we will need to analyze the data based on descriptive statistics and later compile them as a report.

Kindly take your time to fill out our short survey. We really appreciate your response and honest opinions in helping us to complete our project. Thank you and have a great day~

* Required

1. Gender *

Mark only one oval.

- ◯ Male
- ◯ Female

2. Age *

_____

3. Have you ever purchased something online? *

Mark only one oval.

- ◯ Yes
- ◯ No

The Use of E-commerce on Online Shopping

4. What are the Apps you commonly use when you shop online? *

Check all that apply.

- [ ] Lazada
- [ ] Shopee
- [ ] Zalora
- [ ] Taobao
- [ ] Other: _____

5. What are the categories of product you often purchased online? *

Check all that apply.

- [ ] Health & Beauty
- [ ] Electronic Devices & Accessories
- [ ] Fashion
- [ ] Sports & Lifestyle
- [ ] Digital Goods
- [ ] Other: _____

6. How frequent do you shop online in a month? *

Mark only one oval per row.

	0 - 2	3 - 5	6 - 8	9 - 11	>11
Frequency	◯	◯	◯	◯	◯

7. How much do you spend on online shopping in a month? *

Mark only one oval per row.

	0 - 49	50 - 99	100 - 149	150 - 199	200 - 249	> 250
Amount (RM)	◯	◯	◯	◯	◯	◯

8. What is your common payment method? *

Mark only one oval.

- ◯ Credit / Debit Card
- ◯ Touch 'n Go eWallet
- ◯ Online Banking
- ◯ Boost Wallet
- ◯ Other: _____

9. How frequent are you to shop online before/after Covid-19? *

Mark only one oval per row.

	Extremely frequent	Quite frequent	Moderate	Less frequent	Extremely not frequent
Frequency	◯	◯	◯	◯	◯

10. Do you prefer to shop online? *

Mark only one oval per row.

	Extremely preferable	Preferable	Moderate	Unpreferable	Extremely unpreferable
Preferences	◯	◯	◯	◯	◯

6.0 REFERENCE

Bloomenthal, A. (2020, December 14). *Electronic Commerce (e-commerce)*. Investopedia. https://www.investopedia.com/terms/e/ecommerce.asp.

7.0 MINUTE MEETING

Minute Meeting		
Date: 25/4/2021	**Meeting Time**: 5.00pm	**Meeting Location**: Google Meet
Meeting called by	Eunice Lim Xian Ni	
Project Name	The Use of E-commerce on Online Shopping	
Facilitator	Teh Jing Ling	
Note taker	Shabrina Salsabila Sakroni	
Timekeeper	Teh Jing Ling	
Attendees	Eunice Lim Xian Ni, Shabrina Salsabila Sakroni, Teh Jing Ling	

Objectives

- To double check all topics.
- To update each others' progress.
- To finalise the report.

Topics

Title	Presenter	Advisor
Introduction	Shabrina Salsabila Sakroni	Eunice Lim Xian Ni
Data Collection	Teh Jing Ling	Eunice Lim Xian Ni
Data Result	Eunice Lim Xian Ni, Shabrina Salsabila Sakroni, Teh Jing Ling	Teh Jing Ling
Data Analysis	Eunice Lim Xian Ni, Shabrina Salsabila Sakroni, Teh Jing Ling	Eunice Lim Xian Ni, Teh Jing Ling
Conclusion	Shabrina Salsabila Sakroni	Eunice Lim Xian Ni
Appendix	Eunice Lim Xian Ni	-

Action Item

Title	Person in-charge
Introduction	Shabrina Salsabila Sakroni
Data Collection	Teh Jing Ling
Data Analysis and Result	Eunice Lim Xian Ni, Shabrina Salsabila Sakroni, Teh Jing Ling
Conclusion	Shabrina Salsabila Sakroni
Appendix	Eunice Lim Xian Ni