

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING
COVID-19? A STUDY ON PRIVATE HIGHER EDUCATION
INSTITUTIONS IN MALAYSIA

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UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE
DEPARTMENT OF BUSINESS

April 2022

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BY

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A final year project submitted in partial fulfillment of the
requirement for the degree of

BACHELOR OF BUSINESS ADMINISTRATION (HONS)

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


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We hereby declare that:

- (1) This undergraduate FYP is the end result of our own work and that due acknowledgement has been given in the references to ALL sources of information be they printed, electronic, or personal.
- (2) No portion of this FYP has been submitted in support of any application for any other degree or qualification of this or any other university, or other institutes of learning.
- (3) Equal contribution has been made by each group member in completing the FYP.
- (4) The word count of this research report is 25518 words_____ .

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Date: 15 March 2022

ACKNOWLEDGEMENT

With the support and assistance of all parties, this research was carried out smoothly. We are thankful to those who are kind and helpful in providing us with attentive assistance, suggestions, and cooperation in efforts to support us accomplish our final year project. We are extremely grateful to UTAR for enabling us to participate in, learn from, and undertake this research study. We would also want to show our gratitude to the UTAR e-library and computer lab. This is because we are unable to complete this study without the facilities provided.

We would like to express our deepest appreciation to Dr. Tee Chee Wee, our research supervisor, for his consistent advice, guidance, and encouragement throughout the research process. Furthermore, we appreciate his enthusiasm to share his knowledge, opinions, and suggestions with us in order to assist us and give us a clear direction to enhance our research project. We would never be able to complete the research project without Dr. Tee's considerable time and assistance.

Subsequently, we would also like to express our deepest appreciation to our beloved parents who gave us their love and warm wishes to us as support and encouragement to accomplish this research project. In addition, we would like to use this occasion to express our gratitude to our friends and the respondents in the research who sacrificed their time to assist us in answering the questionnaires. We would not be able to accomplish the research on time without them.

Lastly, we would like to express our deepest appreciation and special thanks for every team member who has contributed their time, effort, cooperation, understanding, and tolerance to ensure that the research project is completed on time and with a high-quality result that is valuable to the readers. Thank you.

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

TABLE OF CONTENTS

	Page
Copyright Page.....	ii
Declaration.....	iii
Acknowledgement	iv
Table of Contents	v
List of Tables	xi
List of Figures.....	xiv
List of Abbreviations	xv
List of Appendices... ..	xvi
Preface.....	xvii
Abstract.....	xviii

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

CHAPTER 1 RESEARCH OVERVIEW	1
1.0 Introduction	1
1.1 Research Background.....	1
1.1.1 Industry Background	1
1.1.2 Challenge Faced by the Industry	3
1.1.3 Student Satisfaction on Virtual Learning	4
1.2 Problem Statement	4
1.3 Research Objectives	11
1.3.1 General Objective	11
1.3.2 Specific objectives	11
1.4 Research Questions	12
1.5 Hypotheses of Study.....	13
1.6 Significance of Study	14
1.7 Chapter Layout.....	15
Chapter 1: Introduction.....	15
Chapter 2: Literature Review	16
Chapter 3: Research Methodology	16
Chapter 4: Research Results	16
Chapter 5: Conclusion and Discussion.....	16
1.8 Conclusion.....	17
CHAPTER 2 LITERATURE REVIEW	18
2.0 Introduction	18
2.1 Underlying Theory	18
2.1.1 Herzberg’s Two-Factor Theory	18
2.1.1.1 Herzberg’s Two-Factor Theory link to Student and Instructor Interaction	19
2.1.1.2 Herzberg’s Two-Factor Theory link to Information Quality	20
2.1.1.3 Herzberg’s Two-Factor Theory link to Service Quality	20
2.1.2 Technology Acceptance Model (TAM)	21
2.2 Review variables	22
2.2.1 Dependent Variable: Student Satisfaction	22
2.2.2 1st Independent Variable: Service Quality.....	23

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

2.2.3 2nd Independent Variable: Perceived Ease of Use (PEOU).....	26
2.2.4 3rd Independent Variable: Perceived Usefulness.....	27
2.2.5 4th Independent Variable: Information Quality	29
2.2.6 5th Independent Variable: Student and Instructor Interaction.....	30
2.3 Proposed Theoretical/Conceptual Framework	32
2.3.1 Model 1: Key Factors for Determining Student Satisfaction in Distance Learning Courses: A Study of Allama Iqbal Open University (AIU) Islamabad, Pakistan.	32
2.3.2 Model 2: Impact of Technology Quality, Perceived Ease of Use and Perceived Usefulness in the Formation of Consumer’s Satisfaction in the Context of E-learning.....	33
2.3.3 Model 3: Service Quality, Students’ Satisfaction and Behavioural Intentions in Stem and IC Higher Education Institutions	35
2.3.4 Model 4: Student satisfaction process in virtual learning system: Considerations based in information and service quality from Brazil’s experience.	36
2.4 Proposed Theoretical Model/Conceptual Framework.....	37
2.5 Hypothesis Development	39
2.5.1 The relationship between Service Quality and Student Satisfaction.....	39
2.5.2 The relationship between Perceived Ease of Use and Student Satisfaction.....	41
2.5.3 The relationship between Perceived Usefulness and Student Satisfaction.....	43
2.5.4 The relationship between Information Quality and Student Satisfaction.....	44
2.5.5 The relationship between Student and Instructor Interaction and Student Satisfaction.....	45
2.6 Conclusion.....	47
CHAPTER 3: RESEARCH METHODOLOGY	48
3.0 Introduction	48
3.1 Research Design.....	48
3.2 Data Collection Method	49
3.2.1 Primary Data.....	49
3.3 Sampling Design	50
3.3.1 Target Population	50
3.3.2 Sampling Frame and Sampling Location	51
3.3.3 Sampling Element.....	51
3.3.4 Sampling Technique	52
3.3.5 Sampling Size.....	53

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

3.4 Research Instrument.....	54
3.4.1 Questionnaire Design	54
3.4.2 Pilot Studies.....	56
3.5 Construct Measurement.....	58
3.5.1 Nominal Scale.....	58
3.5.2 Ordinal Scale	59
3.5.3 Interval Scale	60
3.5.4 Origin of Measure of Construct.....	62
3.6 Data Processing.....	66
3.6.1 Data Checking	67
3.6.2 Data Editing.....	67
3.6.3 Data Coding.....	68
3.6.4 Data Transcribing	72
3.7 Data Analysis	72
3.7.1 Descriptive Analysis.....	72
3.7.2 Scale Measurement.....	73
3.7.3 Inferential Analysis.....	74
3.7.3.1 Pearson Correlation Coefficient Analysis.....	74
3.7.3.2 Multiple Linear Regression Analysis.....	76
3.8 Conclusion.....	76
CHAPTER 4: DATA ANALYSIS	77
4.0 Introduction	77
4.1 Descriptive Analysis	77
4.1.1 Respondent Demographic Profile.....	78
4.1.1.1 Private Higher Education Institution Student in Malaysia	78
4.1.1.2 Gender.....	79
4.1.1.3 Age.....	80
4.1.1.4 Year of Study	82
4.1.1.5 Current Location of the Private Higher Education Institution.....	84
4.1.2 Central Tendencies Measurement of Constructs	86
4.1.2.1 Student Satisfaction	86

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

4.1.2.2 Service Quality.....	88
4.1.2.3 Perceived Ease of Use.....	90
4.1.2.4 Perceived Usefulness	91
4.1.2.5 Information Quality	93
4.1.2.6 Student and Instructor Interaction.....	95
4.2 Scale Measurement	96
4.2.1 Reliability Analysis	97
4.3 Inferential Analysis	98
4.3.1 Pearson Correlation Coefficient	98
4.3.1.1 Service Quality and Student Satisfaction.....	99
4.3.1.2 Perceived Ease of Use and Student Satisfaction.....	100
4.3.1.3 Perceived Usefulness and Student Satisfaction	101
4.3.1.4 Information Quality and Student Satisfaction.....	102
4.3.1.5 Student and Instructor Interaction and Student Satisfaction.....	103
4.3.2 Multiple Linear Regression	104
4.4 Conclusion.....	111
CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS	112
5.0 Introduction	112
5.1 Summary of Statistical Analysis	112
5.1.1 Summary of Descriptive Analysis	112
5.1.2 Summary of Inferential Analysis.....	114
5.1.2.1 Reliability Test.....	114
5.1.2.2 Pearson Correlation Coefficient Analysis.....	115
5.1.2.3 Multiple Linear Regression Analysis.....	116
5.2 Discussion of Major Findings	117
5.2.1 Hypothesis 1: Service Quality and Student Satisfaction	118
5.2.2 Hypothesis 2: Perceived Ease of Use and Student Satisfaction	119
5.2.3 Hypothesis 3: Perceived Usefulness and Student Satisfaction.....	121
5.2.4 Hypothesis 4: Information Quality and Student Satisfaction	121
5.2.5 Hypothesis 5: Student and Instructor Interaction and Student Satisfaction	122
5.3 Implications of the Study	123

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

5.3.1 Theoretical Implications	123
5.3.2 Managerial Implications	124
5.4 Limitations of the Study	125
5.5 Recommendations for Future Research	127
5.6 Conclusion.....	128

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

LIST OF TABLES

	Page
Table 3.1: Sample Size for a Given Population Size	53
Table 3.2: Questionnaire in Section A, B and C	54
Table 3.3: Rule of Thumb of Cronbach's Alpha Coefficient Alpha	56
Table 3.4: Summary of Reliability Test Result (Pilot Study)	57
Table 3.5: Example of 5-Point Likert scale from questionnaire	60
Table 3.6: Classification of Scale Measurement	61
Table 3.7: The main Construct's Operational Definition	62
Table 3.8: Coding of Question in Section A	68
Table 3.9: Rule of Thumb of Cronbach's Alpha Coefficient Alpha	73
Table 3.10: Rule of Thumb About Correlation Coefficient Size	75
Table 4.1: Private Higher Education Institution Student in Malaysia	78
Table 4.2: Respondent's Gender	79
Table 4.3: Respondent's Age	80

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Table 4.4: Respondent's Year of Study	82
Table 4.5: Respondent's Current location of the Private Higher Education Institution	84
Table 4.6: Central Tendencies Measurement of Student Satisfaction	86
Table 4.7: Central Tendencies Measurement of Service Quality	88
Table 4.8: Central Tendencies Measurement of Perceived Ease of Use	90
Table 4.9: Central Tendencies Measurement of Perceived Usefulness	91
Table 4.10: Central Tendencies Measurement of Information Quality	93
Table 4.11: Central Tendencies Measurement of Student and Instructor Interaction	95
Table 4.12: Cronbach's Alpha Reliability Test	97
Table 4.13: Correlation between Service Quality and Student Satisfaction	99
Table 4.14: Correlation between Perceived Ease of Use and Student Satisfaction	100
Table 4.15: Correlation between Perceived Usefulness and Student Satisfaction	101
Table 4.16: Correlation between Information Quality and Student Satisfaction	102
Table 4.17: Correlation between student and instructor interaction and Student Satisfaction	103

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Table 4.18: Analysis of Variance (ANOVA)	105
Table 4.19: Model Summary of R-Square	106
Table 4.20: Parameter Estimates	107
Table 4.21: Standardized Coefficients Beta and Ranking	109
Table 5.1: Summary of Descriptive Analysis	112
Table 5.2: The Summary of Pearson's Correlation Coefficient and Multiple Linear Regression for the Independent Variables and Student Satisfaction	117

LIST OF FIGURES

	Page
Figure 2.1: Conceptual Model of Ali, Ramay and Shahzad (2010)	32
Figure 2.2: Conceptual Model of Jalil Shah and Attiq (2016)	33
Figure 2.3: Conceptual Model of Meštrović (2017)	35
Figure 2.4: Conceptual Model of Machado-Da-Silva, Meirelles, Filenga and Brugnolo Filho (2014)	36
Figure 2.5: Conceptual Framework Model	37
Figure 4.1: Private Higher Education Institution Student in Malaysia	79
Figure 4.2: Statistics of Respondent's Gender	80
Figure 4.3: Statistics of Respondent's Age	82
Figure 4.4: Statistics of Respondent's Year of Study	83
Figure 4.5: Statistics of Respondent's Current location of the Private Higher Education Institution	85

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

LIST OF ABBREVIATIONS

COVID-19	Coronavirus Disease of year 2019
e-information	Electronic Information
PEOU	Perceived Ease of Use
SERVQUAL	Service Quality
SOP	Standard Operating Procedure
SPSS	Statistical Package for the Social Sciences
TAM	Technology Acceptance Model
TRA	Theory of Reasoned Action
TSM	Technology Satisfaction Model
UTAR	Universiti Tunku Abdul Rahman

LIST OF APPENDICES

	Page
Appendix 1: Certification Letter	146
Appendix 2: Questionnaire	147
Appendix 3: Reliability Test for Pilot Study	160
Appendix 4: Reliability Test for Actual Study	166
Appendix 5: Descriptive Analysis	172
Appendix 6: Pearson Correlation Coefficient Analysis	178
Appendix 7: Multiple Linear Regression Analysis	181

PREFACE

It is necessary and compulsory for us to conduct this study to finish our course which is Bachelor of Business Administration (Hons). The title for our study is “Are you Satisfied with Virtual Learning during COVID-19? A Study on Private Higher Education Institutions in Malaysia”. The reason of why this research will be conducted was because majority of the students were having virtual learning because of this COVID-19 outbreak and the biggest problem that faced by private higher education institutions was students’ dissatisfaction with virtual learning.

During this COVID-19 pandemic, there are many students are forced to attend their classes through virtual learning instead of the traditional method which is face-to-face learning. Although virtual learning can bring many advantages to students such as it is easier for them to interact with their instructors as well as friends, more flexible hours and many more. However, there are also many reasons that can cause students dissatisfaction to occur. It is very important to know the reasons of why students will be dissatisfied towards virtual learning because when they are dissatisfied, then it may lead them to have bad learning experience and lastly will cause them to have bad results. Nonetheless, when those reasons that cause students to be dissatisfied are known, then the university including instructors can think of the ways to improve those problems and decrease student dissatisfaction. Therefore, this study will provide a further in-depth insight of factors that may affect the student satisfaction towards virtual learning in private higher education institutions in Malaysia.

In a nutshell, it is to say that four independent variables (service quality, perceived ease of use, perceived usefulness as well as student and instructor interaction) except information quality have significant impact on student satisfaction with virtual learning in the private higher education institutions in Malaysia.

ABSTRACT

The COVID-19 pandemic has impacted private higher education and forcing institutions to change its learning methods to virtual learning. Hence, higher education institutions have adopted virtual learning which is a common and required educational method. Students, on the other hand, are unsatisfied with this educational system for a variety of reasons, including unfamiliarity with virtual learning, a shorter lecture duration, and an inability to support them in their future careers. Therefore, the number of students enrolling in private higher education institutions has drastically decreased. This purpose of this study is to examine the factors affecting student satisfaction with virtual learning in private higher education institutions in Malaysia during the COVID-19 pandemic. It studies whether the perceived usefulness, perceived ease of use, service quality, information quality, and student and instructor interaction influence student's satisfaction with virtual learning.

Keywords: Student Satisfaction, Service Quality, Perceived Ease of Use (PEOU), Perceived Usefulness (PU), Information Quality, Student and Instructor Interaction, and Virtual Learning.

CHAPTER 1 RESEARCH OVERVIEW

1.0 Introduction

Student satisfaction is an important feature of a university as it will decrease student performance and affect the university's success. Therefore, researchers have undergone a research to investigate the determinant that will impact the student's level of satisfaction with virtual learning during the COVID-19 pandemic in private higher education institutions in Malaysia. Chapter 1 includes an outline of the research background, problem statement, research objectives, questions, hypotheses, the significance of the study, chapter layout, and conclusion.

1.1 Research Background

1.1.1 Industry Background

COVID-19 brought comprehensive change to the field of education. The adoption of protocols designed to limit COVID-19 transmission through physical and social distances affects the way we live. The Malaysian government has given an announcement, as far as possible to carry out teaching activities in the home, transforming teaching into remote online activities. This phenomenon has an enormous influence, forcing the education world to remote online learning from traditional classroom activities (Suryani & Sugianingrat, 2021).

In Malaysia, there have over 400 private institutions including universities, colleges, and university colleges (Chia, 2021). Since the government announced that, due to the increasing level of inflation in COVID-19, lectures, and tutorial classes had to be quickly transferred online (Choong, 2020). Besides, the ongoing lab research has been postponed, and new student enrollment also has been delayed or rescheduled during this pandemic (Choong, 2020). Almost all student exchanges and academic forums had to be rescheduled. Besides, private higher education institution has been affected by the reduction in the number of student enrolment with an overall decrease from 20% to 50% since the COVID-19 pandemic broke out (Azam, 2021). Nearly 20% of Malaysia's over 400 private higher education institutions are at risk of closing this year, according to data gathered by the Malaysian Association of Private Colleges and Universities (MAPCU) from its members earlier this year (Sharma, 2020).

According to the University World News (2020), Williams, an economist at Malaysia University of Science and Technology, has estimated that 97% of the private universities and university colleges but not including the private college will be a loss this year (Sharma, 2020). He also states that many people were given the impression that it would be a short lockdown (Sharma, 2020). Besides, the current state of private higher education institutions, with approximately 60 private higher education institutions closed down last year due to poor student enrolments and financial issues (Gurubatham & Williams, 2021). Malaysia had almost 600 private higher education institutions in 2013, but only 436 private higher education institutions remained at the end of 2019 (Azman, 2021). Furthermore, the lockdown situation was incredibly challenging for the revenue and long-term planning and exacerbates the budgetary impact. In addition, it is predicted that the international student enrollment could fall by as much as 50% in 2021 and the total enrollment continuing its downward trend as many graduates

return home (Azman, 2021). It was because it will be permanent due to the rapidly changing online environment.

1.1.2 Challenge Faced by the Industry

The key challenge for higher education institutions during this pandemic is to find ways to continue the process of learning and development, and to do so in an environment that is safe for students, academics, administrators, and support staff (Mishra, Gupta & Shree, 2020). According to articles from Bevan Brittan (2020), because of the new norms of social distance, traditional face-to-face instruction is no longer possible in schools today. Universities are seeking to fulfill their teaching obligations to students through a variety of distance learning methods. However, it will produce some teething problems, such as habits technology, loss of face-to-face contact, and in some subjects the ability to use the lab and other necessary facilities such as laboratories (Bevan Brittan, 2020).

According to the Penang Institute (2020), higher education institutions have the next challenge with virtual learning which is the internet connection problem. Since the implementation of MCO, numerous universities and colleges have been required to make changes in order to transform to virtual learning, but this has been extremely problematic. Firstly, even if students and faculty can work around technical obstacles, we cannot expect all students in higher education to have unrestricted Internet connectivity or desktop computers or laptop that enable them to take online courses without limitation (University World News, 2020). Second, the Internet's reach and speed vary based on an individual's affordability and location. For example, some of the students who live in rural areas will have difficulty enjoying Internet access. These students will most likely be left behind if the course is entirely online.

1.1.3 Student Satisfaction on Virtual Learning

Student satisfaction reflects students' experiences of their own educational experiences (Faize & Nawaz, 2020) and is considered a major indicator for assessing students' learning outcomes. This is also vital for evaluating the efficacy of virtual learning (El-Sayad, Saad, & Thurasamy, 2021). The student between instructor interaction quality will also lead to student satisfaction. (Gopal, Singh, & Aggarwal, 2021). Instructors can engage with students by giving them constructive feedback that supports their strengths while also pointing out areas where they can grow (Alqurashi, 2019). In addition, student satisfaction levels enable institutions to assess and improve their online courses (El-Sayad et al., 2021), and it is also linked to student retention and willingness to keep going and finish the courses (Chung & Mathew, 2020). The use of the Internet to learn in a synchronous or asynchronous environment where students can interact with teachers and classmates from anywhere is referred to as online learning (Faize & Nawaz, 2020). Besides, the researchers had found that it has 666,617 students (51%) in over 400 private higher education institutions and 659,082 students (49%) in 20 public universities and branch campuses in Malaysia (Evolution of e-learning in the Malaysian higher education institutions, 2021). The students of private higher education institutions will be our respondents.

1.2 Problem Statement

First and foremost, Farrukh (2020) discover that up to 50% of national students at higher education institutions are dissatisfied with the transition from the face-to-face method to virtual learning during the year 2020. This is because students are no longer

enjoy the interaction between instructors or classmates in the lecture room and tutorial classrooms. When moving to online learning, most of the students choose to stay silent even though they have doubts or questions to ask because they feel shy to speak in a video call. Whereas, if students are attending their classes in the lecture halls or tutorial classroom, lecturers are able to monitor their students and students are also able to communicate with their classmates which easily to discuss the topic of the lecturer teaching in class. Simultaneously, through this learning method students also can form a small discussion group to discuss what each other learns or understand from the topic the lecturer taught in class previously. However, when moving to online learning, it is less conducive to this kind of discussion (Choong, 2020). Although students are appreciated and acknowledged the efforts made to transition to online learning in the context of the worldwide epidemic, but the students say that they are still unfavourable to the experience brought by the online learning and they also don't want to go through it again (Lederman, 2021).

Further, according to Tertiary Education Quality and Standards Agency (2020), the report stated that online learning provides a very different experience for the students either from local or foreign because of the current situation which imposed the strictness of the lockdown in their own country. According to Martin (2021), the obstacles faced by students with online learning which include reduce interaction with academic staff and classmates, difficulties with information technology, a sense of isolation, lack of engagement, lowered motivation, and difficulties for particular subjects switching from face-to-face delivery to online delivery. Thus, no matter which degree they were pursuing and the years of they were studying also being affected. Due to all these issues faced by students, it caused them to feel dissatisfied with online learning (Rodriguez, 2021). Additionally, Tertiary Education Quality and Standards Agency (2020) report also discovered that compare to physical classes, the duration of many online classes is conducted in shorter, and also the students' schedules are often interfered by the rescheduling of classes. Then, it causes a lot of students to think that they are not getting what they paid for and asked for a refund for their tuition fees

(Coman, Țîru, Meseșan-Schmitz, Stanciu & Bularca, 2020). As well as the classes moving to online learning, but the tuition fees also did not reduce, then it caused some of the students considered to withdraw from the university because they did not get a good experience from their online learning classes (Hess, 2020).

Besides, students also feel dissatisfaction as they move to the online learning period. Hence, the issue of losing students is particularly serious in Malaysian Private Higher Education Institutions (Choong, 2020). The problem of financial distress and rising in debt level which is caused by their operational cost is faced by 44% of Malaysian Private Higher Education Institutions (Selvanathan, Hussin & Azazi, 2020). Also, 55% of Malaysian Private Higher Education Institutions are suffering losses which based on the research of Private Higher Education Institutions in Malaysia carried out by Professor Geoffrey Williams as he is a former deputy vice-chancellor from University Tun Razak. As a result, this leads to a situation where 64% of the private higher education institutions falling into a serious debt dilemma in 2018 as well as the current assets and fixed assets were lower than the debt of the balance sheet which undermining the value of shareholder equity. Thereby, in order for most of the private universities and colleges able to continue business, they need to continuously obtain new funds from lenders or shareholders continuous to infusion equity since this is the only option for them to continue operate and no other alternative for them (Murray, 2020).

Additionally, lack of student supports service is considered as one of the factors that contributed to student dissatisfaction with online learning. The majority of students who undergo virtual learning do not get the support from their institution to help them success in an online environment (Uddin, Ali & Khan, 2018). Some of the difficulties encountered by students which include trouble in accessing library support, technical assistance, financial aid services as well as advising and counseling (Jaggars, 2011). Even some of the universities only offered their students with a limited number of downloadable resources through their e-library services (Selvanathan et al., 2020). Another aspect that leads to students dissatisfied are delayed feedback, a sense of

powerlessness, and a lack of guidance provided to them during the online class (Yang & Cornelius, 2004). Musingafi, Mapuranga, Chiwanza, and Zebron (2015) also stated due to the lack of timely or explicit responses from the instructor, it will cause students to feel uncertainty, anxiety, and frustration. As a result, students who are experiencing with the isolation and remoteness of distance learning, the feedback they get from their instructors may not be timely or effective.

Apart from this, another factor that causes students to feel dissatisfied with online learning is online learning required students more mental exertion and physical effort (Jiang, Islam, Gu & Spector, 2021). This is due to online learning has increased the amount of time students spend on their digital devices (Balram, 2020). According to Moses (2021), students may need to spend around 30 hours per week in front of the computer or digital devices to attend their lectures class, tutorial class, and labs as well as carry out their online examinations and project. As students are forced to spend more time in front of the computer or digital devices than recommended, then it contributes some of the physical effects to students. The physical effects such as back problems, eyestrain, dry eyes, and computer-related physical stress, which were most likely to aggravated with increased screen time usage (Idris, Zulkipli, Abdul-Mumin, Ahmad, Mitha, Rahman, Rajabalaya, David & Naing, 2021). Further, when students carry out their online classes, it will result in information overload, and looking at a screen for a long time can be mentally exhausting. Even though students are only sitting in front of a computer, but it will cause them to feel physically tired. Thus, it is difficult for students to acquire new knowledge from their online classes. At the same time, virtual learning fatigue is real, and it may contribute some mental health issues to students such as anxiety, depression, stress, sleep disorders (Balta-Salvador, Olmedo-Torre, Pena & Renta-Davids, 2021). This is due to students suddenly transform from face-to-face to online learning and they need quickly adapt to this new learning style which creates enormous stress and anxiety for them. Also, when students are being in front of the camera, they might feel stress and continual self-awareness (Wirth, 2020).

Furthermore, the next factor that causes students to feel dissatisfied with online learning is the lack of resources to conduct their online learning classes (Adnan & Anwar, 2020). This is due to online learning is required a proper internet connection for students to attend online classes, submit assignments, conduct examinations, and communicate with classmates. Hence, internet access is very significant for every student during their online learning. In other words, for those students who have limited internet access are considered to be facing a difficulty to join the class and might have the risk of getting bad results or being left behind in class (The Manifest, 2020). However, nowadays there are still have some students who do not have an internet connection in their home. Those students usually are come from a low-income family or rural areas who cannot afford the cost of internet connectivity (Phillips, 2021). Although an internet connection is having by students, but the internet coverage and speed will depend on the individual's budget and location. Therefore, some of the advanced students, especially students that live in rural areas, may not have good internet connectivity compared to those who are living in urban areas (Choong, 2020). For example, in Malaysia, one of the 18-year-old university students from Sabah had climbed up to a tree in order to ensure she get a better internet connection to sit for her online examination (Prakash, 2020). Meanwhile, due to lack of internet access, it also will bring a critical impact on the academic achievement of students (The Manifest, 2020). This is due to high speed of internet connections is very significant since it will let students quickly join the class and avoid missing any live sessions (Gopal et al., 2021). However, when students without an appropriate internet connection, they would miss their online classes as well as face some interruptions during their online class (Gustiani, 2020). Thus, it will contribute to poor academic performance for students because they are not able to fully concentrate on their online classes and obtain knowledge from their lecturer or tutor (Lederman, 2021).

Other than that, students are dissatisfied with virtual learning because of the course content delivered by the instructors is poorly designed. This is because students often feel lost when they are looking for information from the course material prepared by

their instructor are irrelevant and inconsistent (Baber, 2020). When students are unable to find the significant information from the course content delivered by their instructors, it causes them cannot properly utilize the information. As a result, this situation leads them to have a feeling of frustration when they are finding the information that they need, as well demotivates them to learn the content and decreased a sense of self-efficacy of them (Loreli, 2021). Other than that, online learning also creates a challenge for those students who are having a poor ability to assimilate information which the instructors are not adapt well to the teaching method. Especially for those students who are taking difficult courses. Also, sometimes some tasks to the students which given by the instructors are also not concise and when students ask their instructor, they also cannot clearly tell their students what they actually want from them. As a result, instructors create confusion and uncertainty for their students because they were unable to quickly adapt to this new teaching method (Coman et al., 2020).

Moreover, the lack of proper interaction among students and instructors is also a factor that causes students to feel dissatisfied with virtual learning. During online learning, students are required to communicate the course information with their instructors through email. Thus, it required more time for students to wait for their instructor to respond to the email (Adnan & Anwar, 2020). This is because mostly the instructors are having a lot of work to do such as teaching several lecture and tutorial classes, checking the students' work assessments, attending staff meetings as well as to conduct their own research projects. As a result, the instructor might not be able to promptly reply to every student email. Apart from this, according to Shim and Lee (2020), poor communications with the instructors also are the factors that lead to students dissatisfied with virtual learning. This is due to students are difficult to communicate properly with their instructors which only through the message type by the instructors through online. As online communication can be varied by the message typing, so they can't fully express the things that what they want to say through the online message. Further, Coman et al. (2020) also stated that students are dissatisfied with virtual learning as it leads them to have a feeling of isolation. Since students spent most of

their time on the computer which they often sit in front of the computer to conduct their virtual learning classes, and this leads to a lack of interaction with their instructor. As they cannot same as before the pandemic which able directly face-to-face communicate with their instructors as now the outbreak of the pandemic which required every student and instructor to follow the standard operating procedure to social distance themselves from other people.

Undoubtedly, the education sector is considered as one of the important sectors in Malaysia. As we know that student is the primary consumers of the private higher education institutions as well as university students are the people who can help the country to develop in the future. However, the biggest issue faced by the current private higher education institutions is students' dissatisfaction with virtual learning. Therefore, private higher education institutions need to offer online learning services which able driven to student satisfaction during this pandemic time in order to avoid losing their students.

Hence, after the researchers read through journal articles related to student satisfaction, the researchers discovered that there are many studies about the student satisfaction that have been carried out by other researchers. But the research was often limited to only countries such as Saudi Arabia (Ali, 2012), Pakistan (Ali, Ramay & Shahzad, 2010), Indonesia (Suryani & Sugianingrat, 2021), Sri Lanka (Hettiarachchi, Damayanthi, Heenkenda, Dissanayake, Ranagalage & Ananda, 2021), Ghana (Agbanu, Sonyo & Ahiase, 2018). With regard to student satisfaction in Malaysia, research findings were limited. There has been minimal research related to student satisfaction with virtual learning in private higher education institutions in Malaysia especially during the pandemic of COVID-19. Thus, the researchers decided to examine the area in order to close the research gap. As a result, the purpose of this research is to examine the various factors that affect student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19. As well as the researchers would like to examine which factors might influence the student satisfaction with virtual

learning in private higher education institutions in Malaysia during COVID-19. In this research, the researchers would like to examine whether the factor which includes service quality, perceived ease of use, perceived usefulness, information quality, student and instructor interaction might affect student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19.

1.3 Research Objectives

The goal of this research is presented in terms of the general objective and specific objectives which are as follows:

1.3.1 General Objective

The general objective of this research is to examine the factors affecting student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19. In this research, the researchers will examine whether there is any relationship between independent variables and dependent variable. The independent variables which include service quality, perceived ease of use, perceived usefulness, information quality, student and instructor interaction while the dependent variable is student satisfaction.

1.3.2 Specific objectives

- i. To investigate whether there is a significant relationship between service quality and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19.

- ii. To investigate whether there is a significant relationship between perceived ease of use and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19.
- iii. To investigate whether there is a significant relationship between perceived usefulness and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19.
- iv. To investigate whether there is a significant relationship between information quality and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19.
- v. To investigate whether there is a significant relationship between student and instructor interaction and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19.
- vi. To investigate whether there is a significant relationship between service quality, perceived ease of use, perceived usefulness, information quality, student and instructor interaction and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19.

1.4 Research Questions

In order to continuously carry out this research, we have developed the following research questions:

1. Is there any significant relationship between service quality and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19?
2. Is there any significant relationship between perceived ease of use and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19?

3. Is there any significant relationship between perceived usefulness and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19?
4. Is there any significant relationship between information quality and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19?
5. Is there any significant relationship between student and instructor interaction and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19?
6. Is there any significant relationship between service quality, perceived ease of use, perceived usefulness, information quality, student and instructor interaction and student satisfaction with virtual learning in private higher education institutions in Malaysia during COVID-19?

1.5 Hypotheses of Study

To determine the relationship between the dependent variable and independent variables, six possible hypotheses will be tested. The research hypothesis for this research is as following:

H1: There is a significant relationship between service quality and student satisfaction.

H2: There is a significant relationship between perceived ease of use and student satisfaction.

H3: There is a significant relationship between perceived usefulness and student satisfaction.

H4: There is a significant relationship between information quality and student satisfaction.

H5: There is a significant relationship between student and instructor interaction and student satisfaction.

H6: All independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction) significantly influence the dependent variable (student satisfaction).

1.6 Significance of Study

In recent times, Malaysia is one of the countries that were affected by the COVID-19 pandemic. This outbreak of COVID-19 has severely disrupted many activities in Malaysia which cause them unable to operate or function as usual. The impact brought by the pandemic has caused various impacts on the entire educational operating system, particularly in higher education institutions. This is because of the sudden outbreak of the COVID-19 pandemic that has caused higher education institutions to change the learning process to become virtual learning. Hence, the primary purpose of this research is to examine the factors that affect student satisfaction with virtual learning in private higher education institutions in Malaysia during the pandemic of COVID-19.

Based on the research, it can provide useful information to the educators to find out the problems that will influence student satisfaction and solve the issue effectively. They can determine the factors which will help them to enhance student learning outcomes and increase the student performance and results towards their virtual learning classes during the pandemic of COVID-19. Hence, they can provide a suitable online learning program for their students which can help them to enhance the quality of online education and mitigate the risk in the future.

On the other hand, this study will also be helpful for all private higher education institutions located in Malaysia. This is because this study will provide a benchmark for the private higher education institutions in Malaysia to better understand which factors are contributing to the student's satisfaction with virtual learning during this pandemic time. Also, through this study, the private higher education institutions can

be based on the findings to develop more strategies which are able to improve the level of student satisfaction towards virtual learning. Meanwhile, this study can also allow private higher education institutions to pay more attention to areas that need to enhance the most to avoid losing their students during this pandemic time since students are seen as customers of the universities. This is because from this study, they were able to understand more about the needs of students and then deliver the virtual learning services according to the needs of students. In the end, they are able to improve their competitive advantage to compete with other private higher education institutions by providing better education services and benefits for their students which allow students to feel satisfied and loyal to their university.

Last but not least, researchers and students who conduct research related to the area of student satisfaction with virtual learning would also benefit from this study. From this study, researchers can have better insight and outlook on which factors will contribute to student satisfaction with virtual learning during the period of the COVID-19 pandemic. This research will provide them effective and reliable information and facts about their specific study field. Simultaneously, this study also helps those students who are doing their assignment regarding the area of student satisfaction with virtual learning which they can refer to the finding of this study as a reference. As a result, it can help them save a lot of time which they do not need to conduct extensive research because they can have a general understanding of the relevant area from this study.

1.7 Chapter Layout

Chapter 1: Introduction

This chapter will discuss the overview of the research background, problem statement, research objectives, research questions, hypotheses, significance of the study, chapter layout, and conclusion.

Chapter 2: Literature Review

This chapter will discuss the underlying theory, review of literature, relevant theoretical framework, and model, proposed research conceptual framework, and hypotheses development.

Chapter 3: Research Methodology

This chapter will discuss the research design, data collection methods, sampling design, research instrument, measurement scales, data processing, and data analysis.

Chapter 4: Research Results

This chapter will discuss the survey was conducted using Google Form. Besides, data collected will be interpreted through SPSS and the result.

Chapter 5: Conclusion and Discussion

This chapter will summarize the results and findings. Besides, this chapter also discuss the theoretical and managerial implications, limitations of this study, as well as recommendations for future study.

1.8 Conclusion

In conclusion, this chapter had discussed the structure and research background including the significance of students' satisfaction with virtual learning during COVID-19 in private higher education institutions in Malaysia. In this chapter, we found out that the independent variables such as student and instructor interaction, perceived ease of use, perceived usefulness, information quality, and service quality will influence student satisfaction in private higher education institutions in Malaysia.

CHAPTER 2 LITERATURE REVIEW

2.0 Introduction

Chapter 2 includes all of the major components in this research, theory, literature review, variables, hypothesis, and framework will be further discussed. The theory is the major concept or direction to offer a better comprehension of the study. Literature review of variables provides finding that related to the research variables. A research hypothesis is a specific, precise, and testable statement or prediction about the most likely outcome. The conceptual framework illustrates the relationships between the ideas and relevance between variables while the hypothesis defines the relationship between variables in this study.

2.1 Underlying Theory

2.1.1 Herzberg's Two-Factor Theory

Herzberg's two-factor theory is a type of theory that states the human's job satisfaction relies on two types of factors which are motivators either known as satisfiers or intrinsic motivators and the other one is hygiene factors which it refers to dissatisfiers or extrinsic motivators (DeShields, Kara & Kaynak, 2005). Based on this theory, if satisfaction is not fulfilled, then it is considered as no satisfaction, while if the person is not dissatisfied, then it is considered as no dissatisfaction (Alshmemri, Shahwan-Akl & Maude, 2017).

For motivators, it refers to those factors that can bring satisfaction to those employees when it is sufficiently fulfilled. They are considered as a component of job content as well as are managed by workers or even students (DeShields et al., 2005). Furthermore, there are elements under motivators which are accomplishment, duty, development, gratitude, growth as well as the work itself (Ghazi, Shahzada & Khan, 2013). However, hygiene factors indicate that the employees will be dissatisfied when those factors are absent and it is controlled by managers but not workers or students (DeShields et al., 2005). Not only that, elements that fall under hygiene factors include salary, working conditions, monitoring, safety, position as well as relationship at work (Ghazi et al., 2013).

2.1.1.1 Herzberg's Two-Factor Theory link to Student and Instructor Interaction

According to Alqurashi (2019), there is a positive along with significant association between student and instructor interaction as well as student satisfaction. According to Herzberg's two-factor theory, student and instructor interaction is considered as hygiene factor (Chyung & Vachon, 2013). There are a few elements of advising staff which include approachability, trustworthy, willingness to help, reply to the students' questions as well as understanding (DeShields et al., 2005). All of these elements are also similar to the course instructor. As DeShields et al. (2005) stated that hygiene factors can be thought for the actions of advising staff which if good advising staff performance is absent, then it will cause students to dissatisfy. Furthermore, Shukla, and Soneji (2020) also found that the duties or responsibilities of advising staff could be considered hygiene factors. Hence, it is also the same with course instructors which if the interaction between student and instructor is absent, then it will lead students to be dissatisfied.

2.1.1.2 Herzberg's Two-Factor Theory link to Information Quality

According to Stefanovic, Drapsin, Nikolic, Scepanovic, Radjo, and Drib (2015), information quality has significant impact towards student satisfaction. The information quality is very important for students because when the information provided by instructors can be easily understood or remembered by students, then they may be able to learn as well as apply the knowledge quickly. Therefore, the students will be satisfied when they did learn and can apply the knowledge. As Chyung and Vachon (2013) stated that the information quality based on the content given by instructor is under motivators factors in Herzberg's two-factor theory which the students will be satisfied if the information quality is beyond their expectations. However, they will show their dissatisfaction when discussing the course instruments like textbooks as well as articles. Nevertheless, when there was high-quality content delivered to students, then it can help to improve their virtual learning experience (Omar, Mokhtar, Yuki, Yusuf & Yusof, 2020). It can be also said that students' virtual learning experience can be improved when their learning quality is good. Lastly, Gibbs and Wood (2021) found that the students' learning quality could be considered as motivators factors.

2.1.1.3 Herzberg's Two-Factor Theory link to Service Quality

Based on Ramírez-Hurtado, Hernández-Díaz, López-Sánchez, and Pérez-León (2021), there is significant impact on service quality of higher education towards student satisfaction. Gibbs and Wood (2021) stated that administrative quality which is also a type of service quality that is under hygiene factor. Service quality can be evaluated in a few aspects which are manner, responsiveness as well as those tangible services such as services that are related to facilities and technical devices. All of these aspects can cause students to be dissatisfied when it is absent

(Purgailis & Zaksa, 2012). For example, when a student asks a staff question due to want to know some information, but the staff is very rude or feels not willing to answer his or her question, then this can cause the student afraid to ask question anymore. When this happens, it may lead to student dissatisfaction. Therefore, it is to say that service quality is considered as hygiene factor.

2.1.2 Technology Acceptance Model (TAM)

While discussing perceived ease of use and perceived usefulness, Technology Acceptance Model (TAM) is the perfect suit for both beliefs. Davis (1989) established the TAM which evaluated an individual's degree of acceptance and usage towards the technology. It provides a comprehensive explanation of drivers of computer adoption which is able to characterize customer behavior among a broad range of devices' computing technology and demographics, and is practical and theoretically justified (Davis, Bagozzi & Warshaw, 1989). According to Davis et al. (1989), TAM is a model for investigating the impact of external conditions on personal traits, behaviors, and desires (Dwidienawati, Abdinagoro, Tjahjana & Gandasari, 2020). TAM, according to Theory of Reasoned Action (TRA), it is a broad theory which can be adapted to anticipate and analyze human behavior in various scenarios (Jiang et al., 2021). When individuals are presented with new technology, TAM states that two elements would impact their decision on how and when to use it (Dwidienawati et al., 2020). Thus, perceived usefulness and perceived ease of use have been categorized as crucial factors in computer acceptance behaviors (Davis et al., 1989). In this research, we will assess the students' perceived ease of use and perceived usefulness toward their expectations of virtual learning – whether the virtual learning provides usefulness and efficiency for students and affect their satisfaction. Despite students' awareness of their expectations for virtual learning, perceived ease of use and perceived usefulness influence their decision to apply it.

2.2 Review variables

2.2.1 Dependent Variable: Student Satisfaction

The significance of satisfaction in evaluating the effectiveness of virtual learning has been emphasized (Dwidienawati et al., 2020). According to El-Sayad et al. (2021), it is also crucial for determining how effective the online learning approach is. Students' satisfaction, identified as a short-term frame of mind leading from learners' comparisons of their educational experience, offerings, and infrastructure (Wang, Han, Liu & Xu, 2021), has been described as including students' perspectives of the value of learning during a virtual mode, the excitement of the virtual learning, and if they can recommend the method or courses to other faculty members (Wang et al., 2021). While Gopal et al. (2021) claimed that satisfaction is the outcome of a particular academic institution's performance. Satisfaction had become the intended accomplishment including an objective that arouses a person's appreciation.

According to Shehzadi, Nisar, Hussain, Basheer, Hameed, and Chaudhry (2020), one of the forms of effective satisfaction occurs once the content and expertise delivered are of the equal standard as desired by students, and it has a favorable implication on their attitude. There are studies also asserted that fulfilled students are more active motivated, and attentive; they participate in an optimal learning environment, and they perform better. Dissatisfied or hesitant students, on the other hand, tend to make it more challenging for educators to foster successful learning circumstances (Chung & Mathew, 2020).

Besides that, there are few outcomes regarding student satisfaction to be presented. Greater student satisfaction indicates that adequately stimulating educational approaches are leading-learners to analyze and learn. According to various research, students who involve in online cooperative initiatives such as tutorials have greater satisfaction in their learning experience than students who did not take part (Harsasi & Sutawijaya, 2018). The institutions will be benefited also as the extent of student satisfaction enable institutions to discover new ways to enhance and build online lessons, and it is also linked to student retention and the tendency to stay and achieve their study (El-Sayad et al., 2021).

While according to Harsasi and Sutawijaya (2018), lower levels of student participation may result from a lesson that is unable to satisfy student expectations and wants. The dissatisfied student will have undesirable behavior intentions for instance undesired word of mouth, lesser student enrollment, and transferring to other institutions (Dwidienawati et al., 2020). Throughout the context of virtual learning, effective satisfaction may decrease, affecting the university's reputation. For example, during the outbreak of the pandemic shutdown, the majority of the universities preferred online learning which potentially decreases student satisfaction as well as the university's reputation (Shehzadi et al., 2020).

2.2.2 1st Independent Variable: Service Quality

The term service quality refers to an organization provide of tangible services in order to fulfill the expectations and perceptions of consumers (Patras & Hidayat, 2020). Besides, Usman and Mohd Mokhtar (2016) proposed the definition of service quality that is based on the ideology which the quality must be judged according to the evaluation of users or students as service consumers. Further, Ayuni and Mulyana (2019) stated that the difference between the delivery of

service and the final outcome of service is refer to service quality. Additionally, service quality can also refer as the difference between the final expectation of consumers towards the service and their feedback or comment on the service performance. When the expectations exceed the performance and quality perception is lower than adequate satisfaction level, it will result in dissatisfaction.

Nevertheless, according to the viewpoint of Li, Asimiran, and Suyitno (2018), service quality is defined as the difference between the student's expectation of the service provided and the student's perception toward the service that they obtained or enjoyed the service. When it comes to higher education institutions, service quality represents a series of dimensions, attributes, and characteristics which related to the services offered by them. Moreover, in order to satisfy the needs and expectations of students, a series of terms and conditions should be provided throughout the education process, thereby, it can be defined as the concept of higher education quality (Meštrović, 2017).

SERVQUAL model is a service quality model that is used to evaluate service quality and consumer satisfaction (Bhasin, 2021). In the conventional educational setting, SERVQUAL has been utilized to measure the service quality. Meanwhile, SERVQUAL model had been adopted by some researchers to determine the higher education service quality. Based on the research conducted by Pham, Limbu, Bui, Nguyen, and Pham (2019) which stated that Cuthbert (1996) is the first researcher who investigate whether SERVQUAL could be adopted to evaluate the student' perceived quality of higher education services. Basically, SERVQUAL model comprises many dimensions of service quality but in this research, we are focused on the dimension of responsiveness, reliability, assurance, and empathy. The readiness to help and provide prompt service is referred to as responsiveness. When it comes to reliability, it is viewed as the capacity to deliver the promised service in precisely and trustworthy manner (Pham et al., 2019). The components that associate with this dimension are the

proper service offered, capabilities and knowledge provided by the staff, and the delivery of services as promised. Assurance refers to the ability to inspire confidence and trust. These dimensions include the offer high-quality of services, students have a high degree of trust in the competence of the staff and the skill and knowledge of the instructors and staff (Mustapha, Jamil, Alshaari & Nordin, 2021). Meanwhile, another characteristic of service quality is regarding the way of how they assist consumers mindfully which refer to as empathy (Shahzad, Hassan, Aremu, Hussain & Lodhi, 2021). The components of empathy include of friendly attitude of the staff, provide useful information that are easy to understand (Mustapha et al., 2021).

Apart from this, Machado-Da-Silva, Meirelles, Filenga, and Brugnolo Filho (2014) also stated that since some basic services such as a help desk, user training, and support are fundamental, so service quality is considered as critical for implementing the information system. The quality of the service will be determined by the performance of the person who are offering the service during that time. Also, services can be provided either online or offline which will be depending on the information system.

Moreover, Li et al. (2018) also highlighted that when come to the education aspect, service quality is determined by the overall service that experienced by students with the institution services. This is because students will experience various components of educational services and activities while during their learning. All those activities can occur either inside or outside the classroom such as interactions between the institution students with teachers, workers, and education facilities (Li et al., 2018). According to Mustapha et al. (2021), the service level of the education sector includes close connection between teacher involvement and professionalism in order to have a significant impact on intermediate and lifelong learning. Other than that, he also pointed out that

service standards are diverse because it involves different aspects of higher education such as physical, structural, and psychological.

2.2.3 2nd Independent Variable: Perceived Ease of Use (PEOU)

PEOU, a study define that it is the extent of which a user views that adopting such an invention may straightforward or easy is known as perceived ease of use (PEOU) (Karim, Haque & Hossin, 2021). Ease of use is also being described to a user's perception of the degree regarding effort required to execute invention (Hussain, Mkpojiogu & Muhammad Mat Yusof, 2016). Individuals will be more inclined to discover about a system's functions and eventually intend to keep adopting it if it is acceptably simple to use (Abdul Hamid, Abdul Razak, Abu Bakar & Wong Abdullah, 2016).

The concept of reasoned action (TRA) asserted that cognitive variables influence behavior, and able be evaluated by projecting behavioral intentions. According to the Technology Acceptance Model (TAM), someone who desires to adopt invention is driven by perceived ease of use, which is recognized to be a crucial driver of user acceptance (Jalil Shah & Attiq, 2016). To prove this statement, Dwidienawati et al. (2020) imply that once someone is introduced with the invention, the two variables asserted by TAM will affect the individuals' selection on how and when to embrace it, one of the variables will be PEOU. In the meanwhile, the TAM concept is the most employed for discovering elements that influence invention acceptance commonly (Tahar, Riyadh, Sofyani & Purnomo, 2020).

Virtual learning also is described as a mechanism that may be viewed in many aspects, such as a computer-based education transmission system presented via the internet or an educational technique that can offer chances for the relevant

individuals at the ideal moment and environment (Zaili, Leow, Yusof, Hanfi & Suhaimi, 2019). According to Harsasi and Sutawijaya (2018), lecturing online involves various teaching techniques and set of abilities than conventional classrooms while referring to several studies. As online learning allows students to study in an immersive, reflective, and cooperative environment, it can be difficult to design educational contexts and discover approaches to assist virtual learning settings that satisfy student requirements. Virtual learning is not as simple to utilize as physical lecturing. The student and the instructor may face several challenges, including invention limitations, restricted communication among students and educators, and the flexibility of online learning. Moreover, constant assessment is becoming increasingly crucial in online learning, particularly in online education (Harsasi & Sutawijaya, 2018)

In other words, virtual learning can be classified as the exchange of understanding between instructor and student and there is a theory that can be quoted, media richness theory. It is taken into consideration regarding the level of richness and the timeframe of exchange understanding able be demonstrated when the individual intends to learn something. The earlier researchers have divided different sorts of groups regarding the term of experience and one of it is experienced with a particular channel (Ishii, Madison & Carr, 2019). Thus, it is shown that process of exchange understanding and the user experience towards an invention aligns with the notion of perceived ease of use.

2.2.4 3rd Independent Variable: Perceived Usefulness

The concept of perceived usefulness is derived from the Technology Acceptance Model (TAM), which describes how people perceive using information systems to help them perform better in higher education institutions (El-Sayad et al., 2021). Perceived usefulness of the reliability and validity as a predictor of willingness

to utilize information technology (Utami, 2021). Based on the TAM, perceived usefulness is the most important determinant of actual system use. Furthermore, social, cultural, and political variables are examples of external factors that influence perceived usefulness. Language and talents are examples of social elements. Political factors are mainly the influence of technology application on politics and political crises (Surendran, 2012). TAM is based on the Theory of Reasoned Action (TRA), a comprehensive theory that has been used to forecast and describe human behavior in a variety of situations (Jiang et al., 2021). TAM concept is the most employed for discovering elements that influence invention acceptance commonly (Tahar et al., 2020).

According to Toni, Holtbrügge, and Berg (2012), the perceived usefulness of new technologies is a crucial determinant of their general acceptance, especially in virtual learning methods. If the learners want to accept virtual learning methods and improve their learning outcomes, they need to perceive the usefulness of virtual learning methods. Based on Keržič, Tomažević, Aristovnik, and Umek (2019), have stated that perceived usefulness is an effective method for evaluating and estimating the effectiveness of a virtual learning system. The learner's behavioral intention to utilize the virtual learning system is influenced by perceived usefulness. A virtual learning system is the main application of information technology in educational institutions.

Researchers in the field of virtual learning systems have commonly utilized perceived usefulness as a factor. Furthermore, in this study Alsabawy, Cater-Steel, and Soar (2016), The key predictors of perceived usefulness were determined to be course delivery, tutor qualities, and suitable environmental conditions. As a result, if the institution can provide perceived usefulness for its students, the students should be able to perform better for the university.

2.2.5 4th Independent Variable: Information Quality

In this study, information quality is the course content presented by the university or college. Course content is the informational resource that is necessary for the participation or comprehension of the subject. Therefore, the quality of information offered to students is critical, and it is a university's responsibility. The purpose is to determine how effective and efficient a course is when it is delivered to students. Information is shared and given via a number of media or methods during a virtual learning session, including online tutorials, online discussions, and web-based courses on multiple platforms (Dewan, Murshed & Lin, 2019).

According to Omar et al. (2020), information quality is the information about the course in which an instructor is in charge, and it measures how useful the course is. Regarding the measurement of information quality, information is considered the most essential component that determines the quality of a virtual learning experience — the better the content quality of the content delivered, the better the virtual learning experience (Omar et al., 2020).

Shehzadi et al. (2020) have found that the empirical research shows that the higher the e-information quality offered, the greater virtual learning students produced. Due to the purpose of enhancing students' virtual learning experiences, particularly during the COVID-19 pandemic, the demand for high-quality information has risen significantly (Shehzadi et al., 2020). Students may be persuaded to use virtual learning platform that allows them to explore the information available for their studies if the information is of higher quality (Zaili, et al., 2019).

Accuracy, currency, completeness, understandability, and timeliness are the typical indicators of information quality (Dwidienawati et al., 2020). The ability

to comprehend information that is not overly sophisticated is characterized as understandability; the amount of required information and how relevant the information is delivered to the students is referred to as accuracy; the quality of knowledge that is widely accepted or in use is referred to as currency; the term "completeness" refers to the delivery of all relevant and necessary information; when it comes to timeliness, it means that the right person has access to the right information at the right time (Shahzad et al., 2021). In addition, completeness, consistency, precision, or relevance should be among the desired information quality attributes (Dwidienawati et al., 2020). These attributes are basically the same as the information quality indicators of accuracy and completeness.

Moreover, an effective designation of information would also improve the student's exam performance (Gopal et al., 2021). According to Gopal et al. (2021), student's understanding is based on the designation of information. In other words, by improving the design of the information, students' understanding of the information will improve. Furthermore, providing high-quality, up-to-date material will assist students in completing their learning process (Omar et al., 2020). Since obsolete material is no longer valid and reliable for students, up-to-date information should be provided.

2.2.6 5th Independent Variable: Student and Instructor Interaction

With the advancement of technology, people around the world started to learn and conduct online classes. Especially during this COVID-19 pandemic, there are many students and instructors will have their classes by using online platforms. According to Parahoo, Santally, Rajabalee, and Harvey (2015), student and instructor interaction refers to communication between both parties which are

students and instructors, and this type of interaction is crucial in virtual learning. This is because it able instructors to convey knowledge as well as comments to the students (Baber, 2020).

The students and instructor not only can have interaction during virtual learning, but the instructor can also give comments on the assignments or reply to the students' questions by using a short period of time. Giving comments is a self-rating instrument for those students and it can assist them to have a better performance as well as learning experience. According to a research result, it showed that instructors who reply to the students' questions as well as give comments on students' assignments within a very short time are able to enhance instructor engagement, interaction as well as understanding (Gopal et al., 2021).

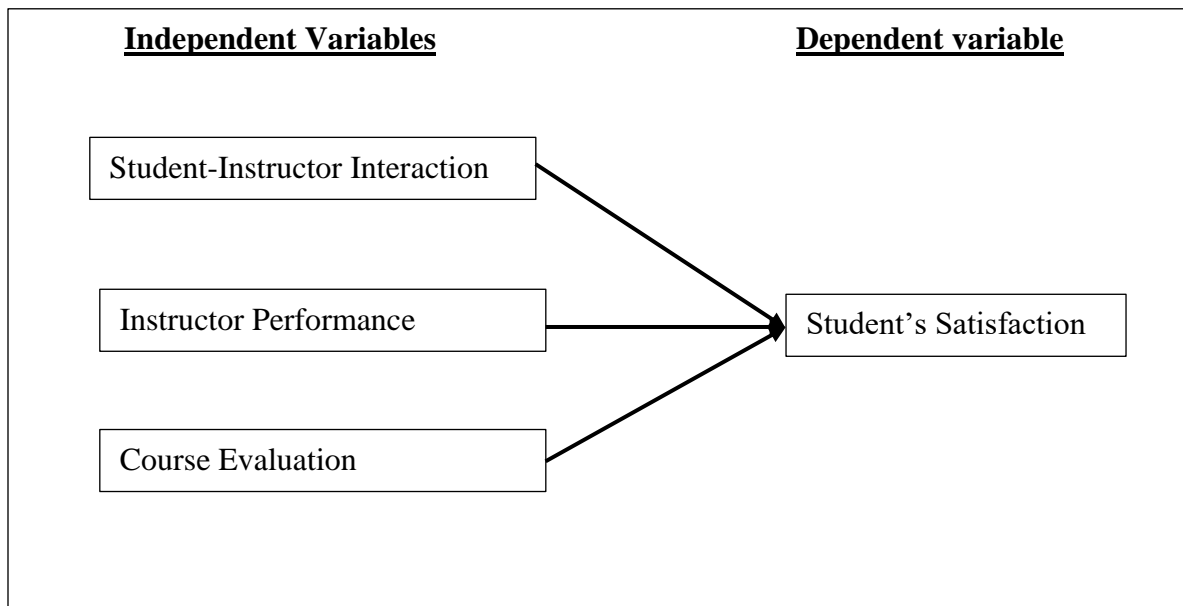
In addition, students' satisfaction are strongly aligned with both the quality as well as the amount of student interactions (Dziuban, Moskal, Thompson, Kramer, DeCantis & Hermsdorfer, 2015). As Alqurashi (2019) stated that students can ask their instructor some questions when they have any doubts and involve in the virtual discussions. Therefore, instructors can respond to their students in a timely manner in order to improve students' satisfaction (Zaheer, Babar, Gondal & Qadri, 2015). Based on Gray and DiLoreto (2016), in order to enhance student interaction in virtual classes, instructors can also encourage students to have analytical thinking, provide positive comments to them, tell some stories when having discussions, and enable flexibility during the virtual classes such as allow students to ask or discuss some questions at any time. Therefore, having these can increase the quantity of interaction among students as well as instructors.

2.3 Proposed Theoretical/Conceptual Framework

2.3.1 Model 1: Key Factors for Determining Student Satisfaction in Distance Learning Courses: A Study of Allama Iqbal Open University (AIOU) Islamabad, Pakistan.

Figure 2.1:

Conceptual Model of Ali, Ramay and Shahzad (2010)



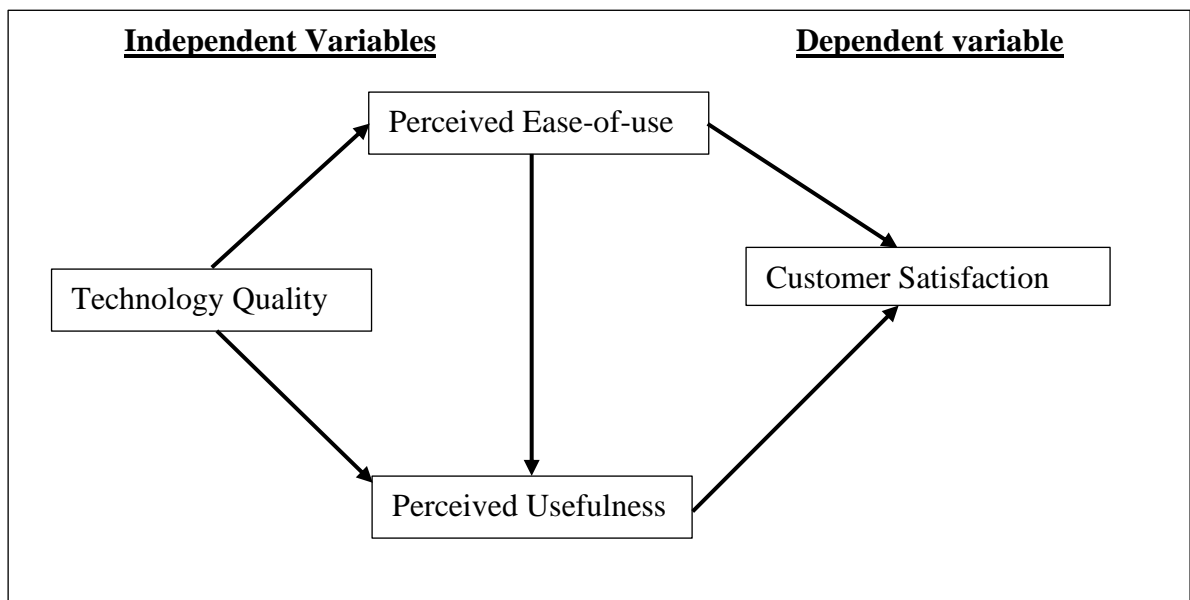
Note. Ali, A., Ramay, M. I., & Shahzad, M. (2010). Key Factors for Determining Student Satisfaction in Distance Learning Courses: A Study of Allama Iqbal Open University (AIOU) Islamabad, Pakistan. *Malaysia Journal of Distance Education*, 12 (2), 33-51.

The objective of this research model is to investigate the main aspects that influence student satisfaction in distance learning courses. The researchers discovered that the most important component in students' satisfaction is student-instructor interaction, followed by instructor performance and course evaluation. According to the results of the coefficient analysis, all of the variables have significant and positive relationships with student satisfaction. Hence, in our research, student-instructor interaction will be adopted.

2.3.2 Model 2: Impact of Technology Quality, Perceived Ease of Use and Perceived Usefulness in the Formation of Consumer's Satisfaction in the Context of E-learning

Figure 2.2:

Conceptual Model of Jalil Shah and Attiq (2016)



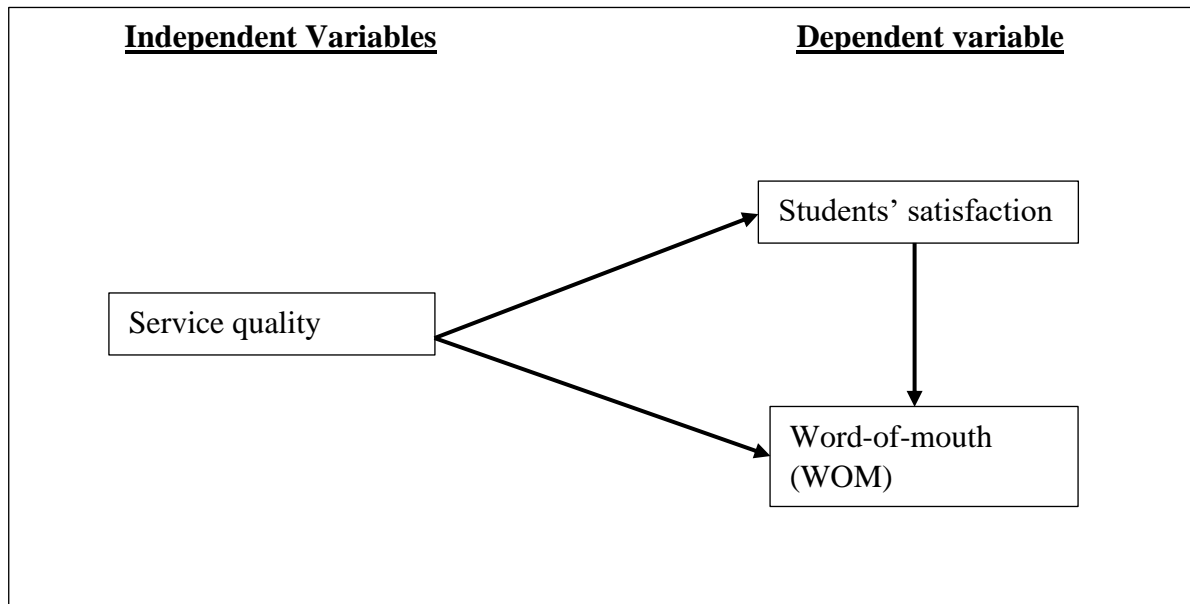
Note. Jalil Shah, H. & Attiq, S. (2016). Impact of Technology Quality, Perceived Ease of Use and Perceived Usefulness in the Formation of Consumer's Satisfaction in the Context of E-learning. *Journal of Social Sciences*, 9(1), 124-140.

This research model is studying the Impact of Technology Quality, Perceived Ease of Use, and Perceived Usefulness in the Formation of Consumer Satisfaction in the Context of virtual learning. In this study, data were collected by the researchers to use the online questionnaire as the primary tool. Three factors were identified by this study model as having the potential to improve customer satisfaction. According to the findings of the coefficient analysis, all of the variables have significant and positive relationships with customer satisfaction. Hence, we will adapt perceived ease-of-use and perceived usefulness to our research.

2.3.3 Model 3: Service Quality, Students' Satisfaction and Behavioural Intentions in Stem and IC Higher Education Institutions

Figure 2.3:

Conceptual Model of Meštrović (2017)



Note. Meštrović, D. (2017). Service quality, students' satisfaction and behavioural intentions in stem and ic higher education institutions. *Interdisciplinary Description of Complex Systems: INDECS*, 15(1), 66-77. doi:10.7906/indecs.15.1.5

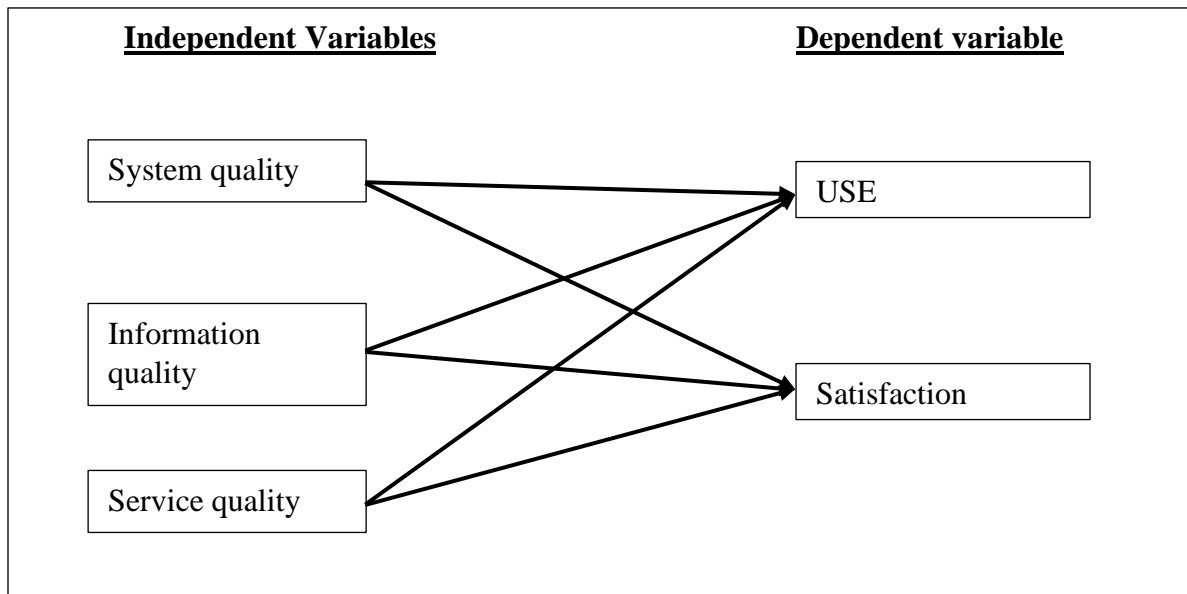
Research that conducted this study aimed to integrate and investigate knowledge gathered from research on service quality, student satisfaction, and word-of-mouth intention as a factor of behavioural intentions. Improvements in all aspects of higher education service quality can be planned based on the findings of this study. The coefficient analysis showed that service quality had a direct significant relationship with student satisfaction, an indirect significant relationship between

service quality and word-of-mouth through student satisfaction, and a significant relationship between student satisfaction and word-of-mouth behaviours. Therefore, in our research, service quality will be adopted.

2.3.4 Model 4: Student satisfaction process in virtual learning system: Considerations based in information and service quality from Brazil's experience.

Figure 2.4:

Conceptual Model of Machado-Da-Silva, Meirelles, Filenga and Brugnolo Filho (2014)



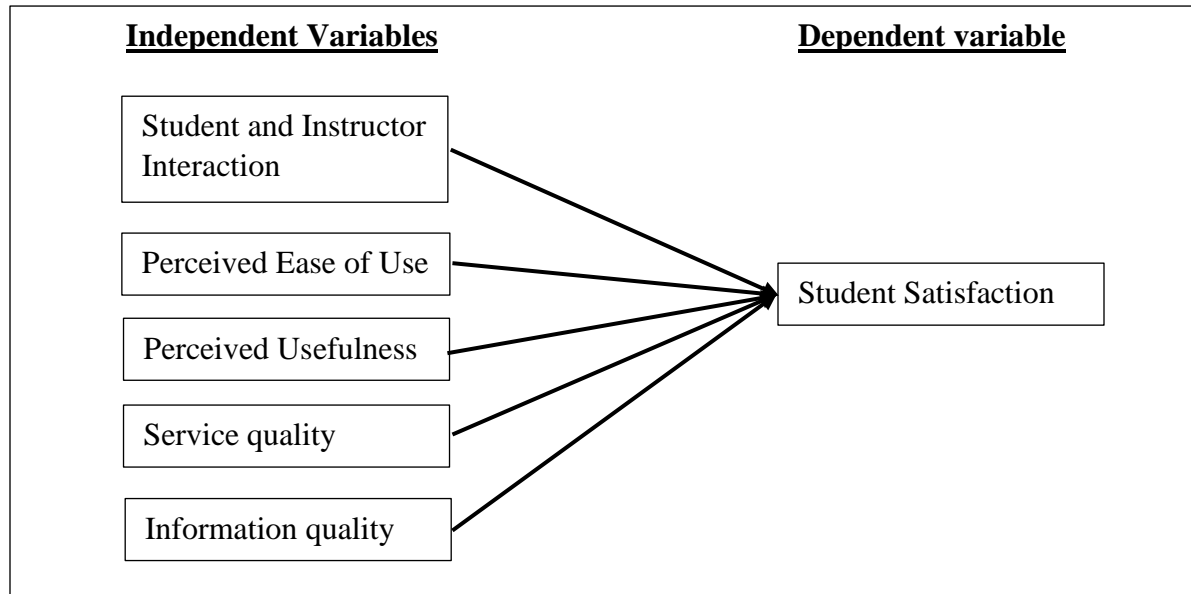
Note. Machado-Da-Silva, F. N., Meirelles, F. D. S., Filenga, D., & Brugnolo Filho, M. (2014). Student satisfaction process in virtual learning system: Considerations based in information and service quality from Brazil's experience. *Turkish Online Journal of Distance Education*, 15(3), 122-142.

The factors affecting student satisfaction in the virtual learning system are investigated in this research model. The respondents are from private and public institutions from several regions of Brazil. This research model identified three factors that will generate the net benefit of distance learning. The coefficient analysis revealed that all of the variables have positive relationships with student satisfaction. Therefore, information quality will be adopted in our research.

2.4 Proposed Theoretical Model/Conceptual Framework

Figure 2.5:

Conceptual Framework Model



Note. Developed for the research

According to previous research models, there are a lot of determinants that can fulfill student satisfaction in virtual learning during the COVID-19 pandemic. However, in this research, student and instructor interaction, perceived ease of use, perceived usefulness, service quality, as well as information quality will be used as the major five factors to be studied. As shown in Figure 2.5, we created a conceptual framework for our research. The elements of the Technology Acceptance Model are integrated into this framework, which was developed from the practical literature (TAM). This framework aims to express student satisfaction concepts in educational institutions, with an emphasis on how to improve student satisfaction. The researchers used Technology Acceptance Model (TAM) to support the relationship between the two independent variables (perceived ease of use and perceived usefulness) with the dependent variable (student satisfaction). In addition, the researchers will focus on Herzberg's two-factor theory to explain the relationship between the three independent variables (student-instructor interaction, service quality, and information quality) and the dependent variable (student satisfaction). This is because according to the hypothesis, the five factors will have a significant impact on student satisfaction. When all the independent variables (student and instructor interaction, perceived ease of use, perceived usefulness, service quality, and information quality) have been increased, then the dependent variable (student satisfaction) also will be increased. In other words, if one of the factors has been reduced, student satisfaction will also be reduced.

2.5 Hypothesis Development

2.5.1 The relationship between Service Quality and Student Satisfaction

Ali, Zhou, Hussain, Nair, and Ragavan (2016) stated that students are the main consumers and education providers are obligated to prioritize their students and fulfill students' expectations. Thus, student satisfaction is very crucial since it is an indicator to evaluate the service quality of higher education (Ayuni & Mulyana, 2019). Moreover, according to Ramírez-Hurtado et al. (2021), the service quality of higher education has a significant impact on student satisfaction. This is because student satisfaction will be influenced by several aspects which include the perceptions of product quality, service quality, price, and also the personal and circumstance factors since it is very diverse (Usman & Mohd Mokhtar, 2016).

Besides, Satuti, Sunaryanto, and Nuris (2020) stated that student satisfaction is collectively influenced by services quality provided by their institutions during their virtual learning. Some of the features of service quality are associated with virtual learning which include course design, support service, technical assistance, administrative service, instructor-to-student interaction as well as student-to-student interaction. It can be known that the better the service quality of online learning it will come out with more satisfaction by students. This is due to when the online learning service quality receive by students is considered as high quality then it will drive a comfortable to the students in their learning courses, thereby, it will result in an increase in student satisfaction.

According to Zaheer et al. (2015), the services that provided by the instructors to the students when conducting virtual learning are including effective communication with the instructor, prompt feedback from the instructor, provide an explicit guideline to meet the course objectives, clarity of the assignment requirements, and expectations and data security. Hence, if all these aspects are also handled properly by the instructors, it will lead to an increase in student satisfaction with virtual learning.

Additionally, service offered by higher education also involves communication between each other. This is because the level of student satisfaction and experiences can affect by the faculty staff. The overall student satisfaction towards the higher education services will be determined by the capacity and obligingness of academic and administrative staff to provide an adequate level of service quality (Camilleri, 2021). When the service offered by an institution is consistently higher than the student's expectations, then the service will be evaluated as a high service quality. On the contrary, when the performance of an institution is lower than the student's expectations, then it will be deemed as a low service quality. When come to the education industry, especially in the higher education institutions, service quality is seen as a significant component of the excellence of Higher Education Institutions (HEIs) (Usman & Mohd Mokhtar, 2016).

Camilleri (2021) also points out unfavourable reviews and ratings are usually will receive by those higher education institutions who are failed to provide an adequate level of service quality to their student since students is the stakeholders of them. Thus, this might create a long-term negative impact on their international rankings and league tables. Because service quality not only will influence student satisfaction but also significant with customer satisfaction and customer retention (Usman & Mohd Mokhtar, 2016).

Uddin et al. (2018) also highlighted that student will create a positive view towards their institutions, if student satisfy all services offered by institutions such as administrative services, courses, programs, and simple access. Meanwhile, Pedro, Mendes, and Lourenço (2018) emphasize that when students have positive views of service quality it may enhance the satisfaction of students. This is because when the service offered are satisfied by students, it might cause them to return to their higher education institutions to take different or more courses and also attract additional students through word-of-mouth communications. Through this way, it will bring continuous advantages to the university as well as provide them with a stronger position to compete with other institutions (Lien, 2017).

H1: There are significance relationship between service quality and student satisfaction.

2.5.2 The relationship between Perceived Ease of Use and Student Satisfaction

In the educational setting, university students frequently encounter challenges in their studies when they are needed to accomplish a variety of learning activities and assessments in a range of aspects. It is justifiable to believe that students will be more motivated to apply the invention in their learning if they perceive it to take minimal exertion. The importance of invention throughout the learning experience would be highlighted. Students, on the other hand, may refuse to adopt inventions thoroughly if they consider them to be inconvenient, despite the value that may contribute to their learning. Therefore, PEOU has been applied repeatedly in research of educational invention acceptability in the educational setting (Huang, Teo, and Scherer, 2020).

The Technology Satisfaction Model (TSM) is among the most major studies for understanding student satisfaction in Asian higher education contexts (Jiang et al., 2021). The Technology Acceptance Model (TAM) asserts that people's desire in adopting invention is primarily driven by their perceived ease of use (Karim et al., 2021). Huang et al. (2020) for instance, discovered that PEOU possessed a beneficial and substantial impact on university reflections regarding using the Internet for English study in Taiwan. Analysis involving PEOU by instructors and students as educational participants also have found out that PEOU has a significant contribution on both instructors' and students' attitudes.

In addition, there are among the most crucial aspects in assuring the success of any invention is user satisfaction. Several studies also have highlighted the significance of user satisfaction in assessing a virtual learning system's effectiveness. User experience may be applied to assess user satisfaction (Omar et al., 2020). It aligns with the concept of PEOU. The effectiveness of the virtual learning platform can have a long-term impact on user behavior. Students who adopt a virtual learning system will remain to employ the platform if they are satisfied with the invention using (Suryani & Sugianingrat, 2021). Despite the online learning platform give a similar presence and perception between options, it frequently employs distinct practices and layouts, resulting in a significantly varied experience according to the online learning platform. As a result, online learning platforms are progressively driving the platform's ease of use (Arbaugh, 2018).

H2: There is a significant relationship between perceived ease of use and student satisfaction.

2.5.3 The relationship between Perceived Usefulness and Student Satisfaction

The qualities of the virtual learning system may influence students' satisfaction with their involvement in online tasks and activities, particularly its usefulness, and this relationship should be further investigated (Burch, Burch, & Womble, 2017). Moreover, perceived usefulness can reflect students' satisfaction that virtual learning can help them learn or perform better in online learning environments. (El-Sayad et al., 2021). To put it another way, the greater the perceived usefulness, the greater the students' performance and satisfaction. Alternatively, the lower the perceived usefulness will decrease the performance as well as the satisfaction of students. Researchers in the virtual learning system have commonly utilized perceived usefulness as a factor.

For example, Arbaugh (2018) argues that delivering students' attitudes regarding their course experience will improve as a result of the perceived usefulness of a course delivered via an electronic medium, and they will be more likely to obtain courses over the Internet in the future. According to the studies, students' satisfaction with virtual learning is influenced by perceived usefulness. Besides, perceived usefulness is treated as an exogenous component in the study by Alsabawy et al., (2016). However, perceived usefulness has been considered as an endogenous factor in some research (Karim et al., 2021). Furthermore, the researchers discovered that course delivery, teacher qualities, and facilitation circumstances were the most important determinants of perceived usefulness. Similarly, According to Mohammadi (2015), ease of use was the most important determinant of perceived usefulness, which was in line with TAM. Hence, perceived usefulness has a significant relationship with student satisfaction. Therefore, the hypothesis is suggested.

H3: There is a significant relationship between perceived usefulness with student satisfaction.

2.5.4 The relationship between Information Quality and Student Satisfaction

During the virtual learning time, one of the most important sources that should be offered to students is information. The majority of the researchers came to the conclusion that information quality has a major effect on virtual learning and student satisfaction. According to Al-rahmi Waleed Mugahed, Othman, and Mi Yusuf (2015) the finding has concluded that students' satisfaction with virtual learning was positively and significantly influenced by virtual learning information quality. Another finding did conclude user satisfaction is strongly tied to the information quality and information quantity applied to the system (Shahzad et al., 2021). According to Zaheer et al. (2015), they have proposed a finding in which the information quality and arrangement have a mean score of 3.70 that indicating students have a good view and believe it to be effective towards the information quality and arrangement of the course.

The hypothesis provided by Stefanovic et al. (2015), stated that the most important component that leads to student satisfaction and successful virtual learning adoption is the quality of the information, which has a strong influence and relationship to student satisfaction level. The finding concluded course flexibility and quality which included the course information are both found to have a substantial impact on student's satisfaction (Stefanovic et al., 2015). A better and well-designed course content, information, and materials affect the student's satisfaction with virtual learning. For instance, understandable

information enhances students' understanding as well as satisfaction towards the virtual learning class.

The finding provided by Zaili et al. (2019) emphasized the design factor and student satisfaction do have a significant effect between both variables when it comes to virtual learning usage. The design factor in the research is regarding the content and the information of the course. According to Zaili et al. (2019), authenticity, correctness, availability, design, and relevance of outputs are the components of information quality. However, the result of the hypothesis testing shows a moderate relationship between information design and student satisfaction. Hence, our study will carry out an accurate relationship in the private universities in Malaysia.

H4: There is a significant relationship between information quality and student satisfaction.

2.5.5 The relationship between Student and Instructor Interaction and Student Satisfaction

Student and instructor interaction is an important aspect in virtual learning because it allows the instructor to convey knowledge as well as comments to the students. According to Baber (2020), the student as well as instructor interaction is a vital factor to determine the student perceived learning along with satisfaction. Due to this COVID-19 outbreak, many students will attend classes through online and this will cause them to spend some time to learn and understand the information from the content. When the students are having self-thinking as well

as understanding from the content, then the interaction with it might be more crucial to their understanding as well as satisfaction (Alqurashi, 2019).

Furthermore, students notice that there are several factors that can lead to have positive learning effect. It includes interaction, inspiration, course content as well as instructor responsibility. It can be stated that when the perceived learning effect in virtual learning is high, then the students will be more satisfied (Baber, 2020). According to Alqurashi (2019), when the students have high quality as well as amount of communication with the instructor, then it is highly possible that the student will have high satisfaction along with the rate of perceived learning. In other words, there is a positive as well as significant association between student and instructor interaction along with student satisfaction.

Nevertheless, as Alqurashi (2019) stated that student satisfaction might vary due to different learning experiences. In addition, the roles of the instructor can also help to improve the students' learning experiences. Based on Lee, Lee, and Kim (2018), the roles of instructor include organizing the course content, examination, activities as well as supervising their students' academic. When instructor is actively participating in academics, then it will enhance the student interest as well as desire to achieve their goals along with self-enhance. It can be said that the number of students who drop out may decrease if the instructors supervise their students' academic. Not only that, the other roles of instructor also considered as taking part in learning environments along with student satisfaction. Hence, it is crucial for the instructors to assess how students view their learning in order to enhance the virtual courses quality which related to designing the course, delivering information as well as evaluation. Lastly, by doing these can help to improve the student's learning experience (Alqurashi, 2019).

H5: There is a significant relationship between student and instructor interaction and student satisfaction.

H6: All independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction) significantly influence the dependent variable (student satisfaction).

2.6 Conclusion

In conclusion, this entire chapter has presented a thorough and complete overview of independent factors as well as the dependent variable. It offers a concept of the research topic in terms of predicting the factors that influence student satisfaction, relying on the findings of the literature review. The study's conceptual framework was also suggested by the researchers. We established hypotheses to evaluate the relationship between the dependent variable and the independent variables after developing the conceptual framework. Following that, in the following chapter, we will go deeper into research methodology.

CHAPTER 3: RESEARCH METHODOLOGY

3.0 Introduction

Research methodology describes how researchers use various research or analytic methodologies to carry out a valid and reliable study outcome. The factors that affect student satisfaction with virtual learning will be investigated in this study. Therefore, in order to provide a valid and reliable result, this chapter will determine the research and analysis method. Research design, data collection method, sampling method, research instrument, construct measurement, data processing, and data analysis will go through in Chapter 3.

3.1 Research Design

To generate excellent investigation, proper design and arrangement are required. According to Blanche (2006), a research design strategic framework that connects research topics to research execution. Quantitative, qualitative, and mixed-method research are the three most common study design approaches. Thus, the quantitative approach has been applied in this study, which requires numerically representing and manipulating observation in order to explain and comprehend the occurrences (Sukamolson, 2007). In other terms, the quantitative approach refers to research that collects numerical data and analyses it by applying statistically oriented approach to understand the occurrence (Sukamolson, 2007). Applying mathematically approach would reduce time-consuming and improve the accuracy of the data analysis.

Researchers would prevent from adopting a qualitative approach as it does not involve numerical and is unable to analyze accurately and effectively using statistics.

In this research, researchers have applied a causal research design as well. To evaluate the relationship between dependent and independent variables, a causal research design might be used. Causal research design is also evaluated as the cause-and-effect studies that examine further into relationship between independent and dependent variables and how they affect one another. The objective of this paper is to determine if the factors (independent variables) have an impact on student satisfaction with virtual learning. Hence, further causal research of the association between independent variables and dependent variable is required and discussed in this research.

3.2 Data Collection Method

Data collection is known as the systematic acquisition and evaluation of information on specified characteristics that allows researchers to answer specific research questions (Kabir, 2016). In other words, data collection is the process whereby researchers collect data relating to variables via a variety of approaches in order to obtain specific information and responses. Data collection begins with establishing the sort of data needed and is followed by selecting a sample from a particular demographic (Kabir, 2016). Therefore, the researcher is able to gather data from the sample with a specific tool.

3.2.1 Primary Data

Primary data is the information that has been collected for the first time with no alternatives or substitutes. Primary data has yet to be published due to the first-hand experience; hence, it is more reliable, original, and impartial (Kabir, 2016). Since primary data has not been updated or manipulated by people, the validity of primary data is relatively higher than secondary data. Questionnaires, interviews, and surveys are among the approaches that could be used to collect primary data. Questionnaire has been chosen to collect data regarding the factors influencing student satisfaction with virtual learning. Due to its ease of use, a questionnaire can collect data in a shorter period and is relatively cost-effective compared to other methods. In this research, researchers create a survey form that consists of multiple questions regarding geographic and variables (independent and dependent) and distribute it to the respondents via an assessable link or email. Google form is able to collect and distinguish the essential data precisely and directly, it was chosen as the survey platform that provides respondents with the most convenience.

3.3 Sampling Design

3.3.1 Target Population

The students from private higher education institutions in Malaysia are selected as the target respondents. According to a Ministry of Higher Education (MOHE)'s report (Evolution of e-learning in the Malaysian higher education institutions, 2021), there has a total of 1,325,699 students to pursue their tertiary education in higher education institutions (HEIs) throughout Malaysia. In the

total of 1,325,699 students, it consists of 666,617 students (51%) in private higher education institutions and 659,082 students (49%) in public universities and branch campuses.

3.3.2 Sampling Frame and Sampling Location

This study has covered private universities and colleges throughout Malaysia such as Universiti Tunku Abdul Rahman (UTAR), UCSI University, Quest International University Perak, INTI International University (IIU), Taylor's University, Sunway University, etc (StudyMalaysia.com, 2020). Therefore, the students who enroll in private higher education institutions in Malaysia will be our respondents. Private higher education institutions are not subsidized by the government and are self-funded (StudyMalaysia.com, 2015). These students from private higher education institutions in Malaysia are selected as the target respondents. It was because we can collect the data easier since we are private universities students. Besides, the researchers will collect the questionnaires from the student who studies in a private higher education institution. Furthermore, the researchers will cover the location in Perak, Selangor, Kuala Lumpur, Malacca etc.

3.3.3 Sampling Element

The aimed respondent of students to answer the questionnaire are considered as the sampling elements. As the normal age group of private higher institutions' students is mainly focus on 18 years old and older whereby all the private higher institutions' students in Malaysia are targeted. There are over 400 private

universities and colleges established in Malaysia and approximately 666,617 students enrolling in it. All the private higher institutions' students from different institutions and colleges are targeted to participate in the questionnaire which is created in google form format.

Besides that, the researchers have adapted to reach more respondents through a different channel. Microsoft team act as a workspace chat and videoconferencing and file storage application are utilized to approach respondents by forwarding the URL link to the student. Facebook, Instagram, and WhatsApp whose act as social media and message transmission mediums are also emphasized for researchers to reach the respondents from various states of private higher institutions.

3.3.4 Sampling Technique

The sampling techniques practiced in the research are non-probability sampling. The convenience sampling technique is described as the researchers gaining the response from respondents in the most convenient way (Sekaran & Bougie, 2019 & Zikmund et al., 2013). The URL link of the questionnaire has been forwarded to the Microsoft Team, Facebook, Instagram, and WhatsApp. It is perceived by researchers that an effective way to obtain responses due to the outbreak pandemic. During the period that we still dealing with the COVID-19 pandemic, the researchers might be restricted to adopt other sampling techniques in order to collect data especially when social distancing is required to be practiced. Most of the students also have staying in the different states they are living, and thus convenience sampling technique is adopted in this study.

3.3.5 Sampling Size

Table 3.1:

Sample Size for a Given Population Size

Population	Sample
30,000	379
40,000	380
50,000	381
75,000	382
100,000	384

Note. Krejcie, R.V., & Morgan, D. W. (1970). Determining sample size for research activities. *Educational and Psychological Measurement*, 30, 607-610.

Since the students who enroll in private higher education institutions in Malaysia will be our respondents, according to table 3.1, our population of 666,617 students will fall in the population of 100,000. As a result, the researchers chose a bigger population to set the sample size, as this study requires 384 respondents. In contrast, the required respondents are only 0.058% $\left(\frac{384}{666,617} \times 100\%\right)$ of the total amount of students.

3.4 Research Instrument

Questionnaires are the method that we utilize to obtain data from our target respondents. The term questionnaire refers to a type of research technique that composed of a list of questions that are intended to acquire information from respondents (McLeod, 2018). The reason that we use questionnaire is because nowadays the pandemic has become more serious as we also need to follow all the standard operating procedures and keep social distance from everyone in order to minimize the chance of getting infection. At the same time, questionnaire is also a way that is less time-consuming, cost-effective, simple and quickly to gather the accurate information from a huge number of respondents. Thus, compare with other methods like interview or observation, we think that the most suitable technique for us to gather data from our target respondents is questionnaire (Rahman, 2020). Further, researchers have adopted all the questions from the journal and make some modifications for the questions and come out with all the questionnaires. This is because through this method it can ensure the questions are high validity. After done with the questions, we had used the Google form to create our questionnaires. Then, the questionnaires will be distributed through some applications such as Facebook, Instagram, and Microsoft Teams to our target respondents who are students studying in private higher education institutions.

3.4.1 Questionnaire Design

Table 3.2:

Questionnaire in Section A, B and C

Section	Components / Variables
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Section A	Demographic Profile
Section B	Dependent Variable: Student Satisfaction
Section C	Independent Variables: Part 1: Service Quality Part 2: Perceived Ease of Use Part 3: Perceived Usefulness Part 4: Information Quality Part 5: Student and Instructor Interaction

Note. Developed for the research

In our survey questionnaire, we had designed the questionnaire in a straightforward and concise way in order to let the respondents easily understand the questions and fill it in a short period of time. The questionnaires consist of three main sections which are Section A, Section B, and Section C. In Section A, all the questions are related to the demographic profile of respondents. We used both nominal and ordinal scale in this section A and the purpose of this section is to collect some brief information of the respondent. There are consists of total 6 questions for respondents to fill up which include gender, age, year of study, the current location of the private higher education institution, and so on. Besides, in section B, there are consists total of 6 questions and it is designed to measure the dependent variable which is student satisfaction. Likewise, in section C, there are consists total of 26 questions to measure all the independent variables. All the questions in Section C are all about factors that affect student satisfaction which include service quality, perceived ease of use, perceived usefulness, information quality and student and instructor interaction. 5-Point Likert Scale rating are used

in designing the questionnaires for both Section B and Section C. We will provide five alternatives for respondents make ranging to the questions from (1) strongly disagree, (2) disagree, (3) neutral, (4) agree and (5) strongly agree. In order to prevent redundancy of information, we only allow respondents to choose 1 answer which nearer to their own viewpoint for each question.

3.4.2 Pilot Studies

A pilot study refers to a preliminary small-scale study that is conducted by researchers to help them to conduct their main study in more effective and quality (Ashley, 2019). Before we carry out the actual studies, we had delivered total of 30 sets of questionnaires to our target respondents who are the student studying in the private higher education institutions in order to ensure the validity and reliability of the questionnaires. After collected back all the questionnaires, we used Statistical Package for the Social Sciences (SPSS) software to analyse the data. This is because through this method, it can ensure the results are valid and reliable. Furthermore, we also used the most popular method which is the Rule of Thumb of Cronbach's Alpha Coefficient to determine the strength of each reliability analysis. There are consist of 5 strengths in the Rule of Thumb of Cronbach's Alpha Coefficient. The Alpha Coefficient Range of Strength of Association as shown in Table 3.3.

Table 3.3:

Rule of Thumb of Cronbach's Alpha Coefficient Alpha

Alpha Coefficient Range	Strength of Association
<0.6	Poor

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

0.6 to <0.7	Moderate
0.7 to <0.8	Good
0.8 to <0.9	Very Good
>0.9	Excellent

Note. Hair, J. F., Celsi, M., Money, A., Samouel, P., & Page, M. (2016). *The Essentials of Business Research Method.* (3rd ed). New York: Routledge.

Table 3.4:

Summary of Reliability Test Result (Pilot Study)

	Number of Items	Cronbach's Alpha	Strength of Reliability
Dependent Variable:			
Student Satisfaction	6	0.892	Very Good
Independent Variable:			
Service Quality	5	0.929	Excellent
Perceived Ease of Use	5	0.932	Excellent
Perceived Usefulness	5	0.962	Excellent
Information Quality	6	0.970	Excellent
Student and Instructor Interaction	5	0.952	Excellent

Note. Developed for the research

Based on Table 3.4, it shows that the results of the reliability test for the pilot study that we obtain from the SPSS software for this research. The Cronbach's Alpha value of the dependent variable (student satisfaction) is 0.892. According to Hair, Celsi, Money, Samouel, and Page (2016), the range between 0.8 and 0.9 is considered as very good reliability. Thus, as the Cronbach's Alpha value of the dependent variable (student satisfaction) is 0.892 which falls within the range of 0.8 to <0.9, so it indicated as very good reliability. Besides, the Cronbach's Alpha value of service quality, perceived ease of use, and perceived usefulness is 0.929, 0.932, and 0.962 respectively. Further, the Cronbach's Alpha value of information quality is 0.970 and it is considered as the highest reliability among all the independent variables. As well as for student and instructor interaction, the Cronbach's Alpha value is 0.952. According to Hair et al. (2016), the range more than 0.9 is considered as excellent reliability. Since the Cronbach's Alpha value of all the independent variables are falls under the range of >0.9, thus, all indicate as excellent reliability. Hence, this result has shown that these questionnaires are reliable and suitable for researchers to carry out their further research on a greater scale of respondents.

3.5 Construct Measurement

3.5.1 Nominal Scale

With objectives of identification or categorization, a nominal scale provides a value to an element. No measurements are being presented, the value can and will

not need to represent a figure (Sekaran & Bougie, 2019; Zikmund, Babin, Carr, Griffin, 2013). The nominal scale indicates the most fundamental measuring level and the researchers have categorized question 1 (Nature of institution), question 2 (Student ID), and question 3 (Gender) in section A of the questionnaire.

Example of nominal scale:

3. Gender

Male

Female

Note. Developed for the research

3.5.2 Ordinal Scale

A ranking scale is defined as an ordinal scale in other terms. The ordinal scale has nominal properties, but it enables items to be organized according to what kind of an idea have (Sekaran & Bougie, 2019; Zikmund et al., 2013). It also will not provide the significance of the range among rankings such as the question from section A especially question 4 (Age) and question 5 (Year of Study).

Example of ordinal scale:

4. Age

18 years old to 21 years old

22 years old to 25 years old

Above 25 years old

Note. Developed for the research

3.5.3 Interval Scale

An interval scale contains mixed nominal and ordinal attributes, it measures information about the changes of concept quantities (Sekaran & Bougie, 2019; Zikmund et al., 2013). The researchers have adopted the 5-Point Likert Scale in the designated questionnaire in section B and section C. 5-Point Likert Scale is a form of psychometric reaction measure that the respondents' feedback with a statement on a five-point scale (McLeod, 2019). The adopted 5-point scale and the example are given:

Example of 5-Point Likert Scale:

Level of agreement: 1 – Strongly Disagree

2 – Disagree

3 – Neutral

4 – Agree

5 – Strongly Agree

Note. Developed for the research

Table 3.5:

Example of 5-Point Likert scale from questionnaire.

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I think virtual learning is a beneficial learning approach.	1	2	3	4	5

Note. Developed for the research.

Table 3.6:

Classification of Scale Measurement

Particulars	Questions	Scale measurement
Section A		
Q1.	Nature of institution	Nominal
Q2.	Student ID	Nominal
Q3.	Gender	Nominal
Q4.	Age Group	Ordinal
Q5.	Year of study	Ordinal
Q6.	Location of Studying Institution	Nominal
Section B & C		
Part 1	Student Satisfaction	Interval
Part 2	Service Quality	Interval
Part 3	Perceived Ease of Use	Interval

Part 4	Perceived Usefulness	Interval
Part 5	Information Quality	Interval
Part 6	Student and Instructor Interaction	Interval

Note. Developed for the research

3.5.4 Origin of Measure of Construct

Table 3.7:

The main Construct's Operational Definition

Variables	Construct Measurement	Sources
Student Satisfaction	<ol style="list-style-type: none"> 1. I think virtual learning is a beneficial learning approach. 2. Virtual learning has become a positive experience for me. 3. When I am adopting an online platform in the virtual process, it fulfilled my expectations. 	Adopted from Dwidienawati et al. (2020); Jiang et al. (2021)

4. When applying to an online learning platform, it has impacted my learning approach.
5. I am satisfied with the time needed to accomplish my tasks when adopting the online platform.
6. I am satisfied when performing my tasks effortlessly by adopting online learning platforms.

Service
quality

1. I feel every online tutorial complaint is promptly addressed.
2. I am satisfied with the solutions of the problems provided by instructor during the online learning process.
3. Instructor often deal with me in a caring and courteous manner.
4. I feel that the instructor is always friendly in managing online tutorial classes.
5. I feel that the instructor has good competence.

Adopted from
Ayuni and Mulyana
(2019); Uddin, Ali, and
Khan (2018)

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Perceived Ease of Use (PEOU)	<ol style="list-style-type: none"> 1. I feel online learning platforms are simple to access. 2. I think it is comprehensible by using online learning platforms. 3. When I am utilizing online learning platforms, I feel it is user-friendly. 4. It is simple for me to master the way to use online learning platforms. 5. I need less mental exertion to engage with online learning platforms. 	<p>Adopted from Jiang et al. (2021); Lee (2010)</p>
Perceived Usefulness	<ol style="list-style-type: none"> 1. I use the virtual learning platform in my study to enable me to complete my tasks quickly, 2. By using the virtual learning can help me to improve my study performance. 3. I use the virtual learning platform to make it easier to do my study. 	<p>Adopted from Alsabawy et al. (2016); Jiang et al. (2021)</p>

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

4. By using the virtual learning platform in my study has improved my efficiency

5. By using the virtual learning platform has improved my knowledge and study skills.

Information	6. I feel the information provided	Adopted from
Quality	virtual learning is in a useful format (e.g., computerbased/webbased/gam ebased/AR/VR/videos/webinars).	Alzahrani and Seth (2021); Al-Rahmi et al. (2018)

7. I feel the information provided by virtual learning is easy to understand.

8. I feel the information provided by virtual learning is accurate and up to date.

9. The information provides me with sufficient content.

10. The information provides me with useful content.

11. I feel the information provided is
related to my course.

Student and
Instructor
Interaction

1. The instructor was able to adequately communicate.
2. The instructor did concern about my learning.
3. I was able to communicate with the instructor outside of the virtual classes.
4. The instructor replied to my queries in a timely manner.
5. The instructor provided some exercises for me to discuss during virtual classes.

Adopted from
Gopal et al. (2021);
Alqurashi (2019)

Note. Developed for the research.

3.6 Data Processing

Data processing refers to the process that the researchers using the data that obtained from the questionnaires to convert into usable information. Researchers must complete with the step of data processing first before analyzing the data.

3.6.1 Data Checking

The initial step in data processing is data checking. This process is to examine the questionnaires that receive from respondents and ensure the respondents had answered all the questions in the questionnaires. Researchers will also carry out the pilot test before the reliability test by using 30 sets of completed questionnaires in order to ensure the measurements are valid, precise, and consistent. This is because after carrying out the pilot test it can detect out the errors and correct it. In this step, we will check every questionnaire after we received all the 30 sets of questionnaires from our respondents in order to ensure all the questions have been answered completely by the respondents. However, after we had done the checking total of 30 sets of questionnaires, we found out there is no error had been made in this process. Therefore, we will proceed to the next step of data processing which is the data editing.

Nevertheless, when we conduct our actual study, we found out that there has a total of 51 sets of questionnaires that are not meet the requirement which are not a student from private higher education institutions, so we just removed the 51 sets of questionnaires that are not meet the requirement in order to proceed to next step which is data editing.

3.6.2 Data Editing

Besides, data editing refers to the process of reviewing all the questionnaires that receive from the respondents in order to identify the errors and correct incomplete,

omissions, inconsistencies, or illegal data in the questionnaires. For example, if receive any blank responses from the questionnaires that returned by the respondent, the researchers must handle it by checked and followed up with the respondents. This is because sometimes respondents may misunderstand, misread, or unwilling to answer certain questions in the questionnaires, thereby, it results in omissions (Sekaran & Bougie, 2016). Through this step, it can ensure the data that we get from the respondents is accurate, consistent, complete as well as facilitates for further processing. However, when we conduct the data checking process, we did not find out any errors or incomplete in the questionnaires. So, we did not make any adjustments to the questions. Hence, we will directly proceed to the next step which is data coding.

3.6.3 Data Coding

Additionally, data coding is the following step. Data coding can be explained as a process that assign a codes or numbers on the responses received from the questionnaire before entering the responses into the database (Sekaran & Bougie, 2016). After we done both the checking and editing process, we will proceed to the step of data coding. In this step, we will allocate the code on the responses of respondents. The sample of coding that will be applied in this research study is shown in Table 3.8.

Table 3.8:

Coding of Question in Section A

No.	Questions	Coding
-----	-----------	--------

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

1	Are you a private higher education institution student?	1 = Yes 2 = No 99 = Missing Data
2	Gender	1 = Male 2 = Female 99 = Missing Data
3	Age	1 = 18 years old to 21 years old 2 = 22 years old to 25 years old 3 = Above 25 years old 99 = Missing Data
4	Year of study	1 = Year 1 2 = Year 2 3 = Year 3 4 = Above Year 3 99 = Missing Data

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

5	Current location of the Private Higher Education Institution	1 = Johor
		2 = Kedah
		3 = Kelantan
		4 = Malacca
		5 = Negeri Sembilan
		6 = Pahang
		7 = Perak
		8 = Perlis
		9 = Terengganu
		10 = Selangor
		11 = Sabah
		12 = Sarawak
		13 = Penang
		14 = Kuala Lumpur
		15 = Labuan
		16 = Putrajaya
99 = Missing Data		

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Note. Developed for the research

In sections B and C of the questionnaire, the coding for the dependent variable and independent variables are listed as below:

Dependent variable:

SS = Student Satisfaction

Independent variables:

SII = Student and Instructor Interaction

SQ = Service Quality

IQ = Information Quality

PEOU = Perceived Ease of Use

PU = Perceived Usefulness

Simultaneously, 5-point Likert Scale also has been used in sections B and Section C of the questionnaire. The coding style is listed as below:

1 = Strongly Disagree

2 = Disagree

3 = Neutral

4 = Agree

5 = Strongly Agree

99 = Missing Data

3.6.4 Data Transcribing

Lastly, the last step is data transcribing. In this step, we will transcribe all the data collected from the questionnaires into the SPSS software for data analysis. The reason that we use SPSS software because it enables us to test and perform the statistical analysis. Researchers also need to edit and amend the data because sometimes we may receive some inconsistent response from the respondents. However, we found out all the questions in the questionnaire is fully completed by respondents, so we did not edit and amend the data. Meanwhile, since all the questions in our questionnaire without any negative questions, so we found out without the error from any respondents. Hence, we did not carry out the process of reverse scoring.

3.7 Data Analysis

For this part, we will interpret all information that we got from the questionnaires that answered by the respondents and we will use a software that is known as SPSS to interpret the information.

3.7.1 Descriptive Analysis

Descriptive analysis is a technique that is used to count, explain as well as summarize all the data that have been collected from questionnaires in a reasonable, meaningful along with efficient way. It can be recorded numerically

in a table or graph form (Vetter, 2017). We will make a summary of the demographic profile data of the respondents.

3.7.2 Scale Measurement

Having a reliability test is a crucial step for this study because it concerns the scale to which results that got from the respondents are stable as well as consistent or not (Taherdoost, 2016). An estimator which is known as Cronbach's Alpha with a symbol α will be applied for determining the reliability of dependent along with independent variables. As Ramli (2019) stated that α value that is lower than 0.6 can be viewed as weak or unreliable construct. However, the value of α that is between 0.6 to 0.7 is consider as either satisfactory level or reliable construct or even average. For the value that between 0.7 to 0.8 can be viewed as good (Ursachi, Horodnic & Zait, 2015). Then for the value of Cronbach alpha, α of 0.8 to 0.9 is consider as very good level or also known as high reliability standard (Mahjom, Razak, Muhammad, Hussin & Mansor, 2019). Furthermore, the value that is above 0.9 can be known as excellent (Miremadi, Toutoue & Oghani, 2013).

Table 3.9:

Rule of Thumb of Cronbach's Alpha Coefficient Alpha

Cronbach's Alpha, α value	Reliability
Below 0.6	Weak
0.6 – 0.7	Average
0.7 – 0.8	Good
0.8 – 0.9	Very good

Above 0.9

Excellent

Note. Developed for the research

3.7.3 Inferential Analysis

Inferential analysis does include Pearson correlation coefficient analysis along with multiple linear regression analysis and both of it are applied to study the association between dependent variable as well as independent variables. Independent variables for our study involve service quality, perceived ease of use, perceived usefulness, information quality as well as student and instructor interaction. Then, student satisfaction will be our dependent variable.

3.7.3.1 Pearson Correlation Coefficient Analysis

As Bakar, Hassan, Zakaria, and Halim (2019) stated that Pearson correlation coefficient analysis is an approach for determining the association's strength which is among two variables which are the dependent as well as independent variable. There are five hypotheses that will be investigated through Pearson Correlation Coefficient which are:

H1: There is a significant relationship between service quality and student satisfaction.

H2: There is a significant relationship between perceived ease of use and student satisfaction.

H3: There is a significant relationship between perceived usefulness and student satisfaction.

H4: There is a significant relationship between information quality and student satisfaction.

H5: There is a significant relationship between student and instructor interaction and student satisfaction.

The coefficient scaled from -1 to $+1$, with 0 indicating no linear or monotonic association. Also, relationship considered stronger and eventually reaches a straight line when the coefficient reaches exact value of 1 (Schober, Boer and Schwarte, 2018). Table 4.0 shows the range of coefficient value as well as interpretation of the strength between the relationship of dependent along with independent variables.

Table 3.10:

Rule of Thumb About Correlation Coefficient Size

Coefficient Value	Strength of Association
$\pm 0.91 - \pm 1.00$	Very strong
$\pm 0.71 - \pm 0.90$	High
$\pm 0.41 - \pm 0.70$	Moderate
$\pm 0.21 - \pm 0.40$	Small but define relationship
$\pm 0.00 - \pm 0.20$	Slight, almost negligible

Note. Hair, J. F., Page, M., & Brunsveld, N. (2019). *Essentials of business research methods*. Routledge.

3.7.3.2 Multiple Linear Regression Analysis

Determining the associations among dependent variable along with one or multiple independent variables is referring to a type of analysis known as multiple linear regression analysis (Oguntunde, Lischeid & Dietrich, 2018). Using this method can help to identify which independent variable has the highest contribution until the lowest to the dependent variable variation by depending on their beta value. Hypothesis that will be tested by using multiple linear regression is:

H6: All independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction) significantly influence the dependent variable (student satisfaction).

3.8 Conclusion

Theories and the way to conduct research methodology have been interpreted in this chapter. This chapter covers research design, data collection methods, sampling design, research instrument, construct measurement, data processing as well as data analysis. Subsequently, we decided to have further study as well as discussion on data analysis in the upcoming chapter.

CHAPTER 4: DATA ANALYSIS

4.0 Introduction

In chapter 4, researchers will further discuss and explain the data obtained for the research. SPSS software (Version 28) has been utilized to analyze the results that were collected from the respondents. Besides, those students who are studying in Malaysia Private Higher Education Institutions will be the target respondents of our research. The questionnaires that we received from respondents were total of 451 sets of questionnaires but 51 out of 451 sets of questionnaires were not fulfilled the requirement which is not a student from private higher education institutions. Thus, the data that we use to analyze for our research will be those 400 respondents who are studying in Malaysia Private Higher Education Institutions. The survey results that we collected from respondents are explained in detail by using pie chart, bar chart, and table. Further, this chapter will further explain the relationship between the independent variables (service quality, perceived ease of use, perceived usefulness, information quality, student and instructor interaction) and the dependent variable (student satisfaction).

4.1 Descriptive Analysis

The process of explaining or summarizing a set of data by using statistical techniques is referred to as descriptive analysis (Bush, 2020). In this part, some simple graphics such as tables, pie charts, and bar charts had been utilized by the researchers to describe

and summarize the data collected. The purpose of the researchers using graphics to describe is to make readers easy to understand the respondent's demographic profile.

4.1.1 Respondent Demographic Profile

This section will discuss the details of the demographic profile collected from respondents which include age, gender, year of study, and their current private higher education institution location.

4.1.1.1 Private Higher Education Institution Student in Malaysia

Table 4.1:

Private Higher Education Institution Student in Malaysia

Private Higher Education Institution Student in Malaysia	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Yes	400	100.0	100.0	100.0
No	0	0		100.0
Total	400	100.0		

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

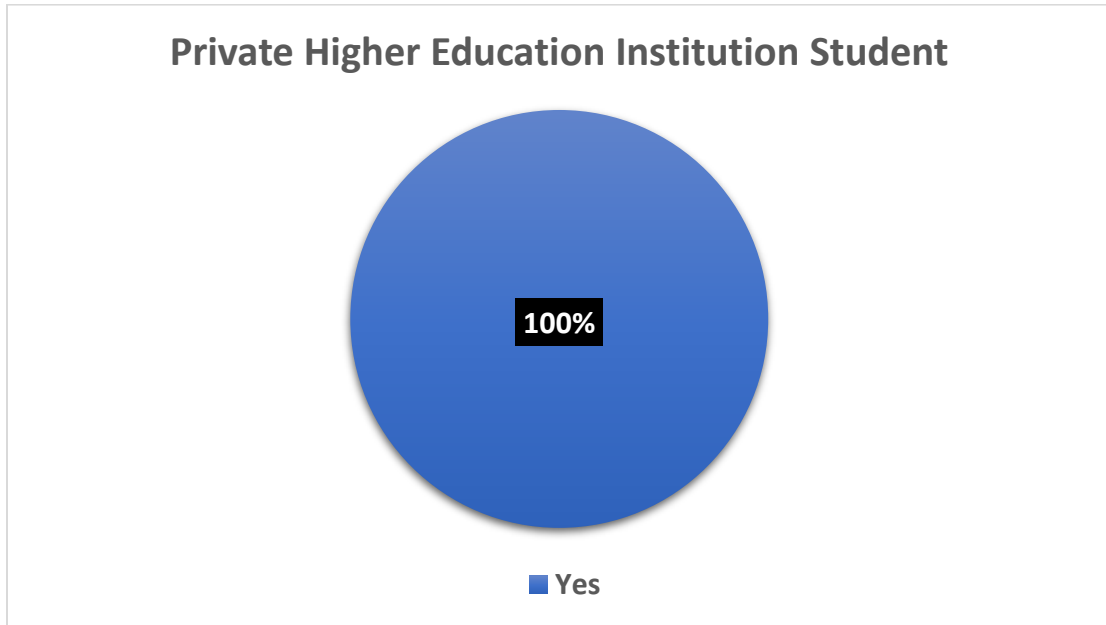


Figure 4.1. Private Higher Education Institution Student in Malaysia. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Based on Table 4.1 and Figure 4.1, all of the respondents are students from private higher education institutions in Malaysia where consists of total 400 respondents.

4.1.1.2 Gender

Table 4.2:

Respondent's Gender

Gender	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Male	150	37.5	150	37.5

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Female	250	62.5	400	100.0
Total	400	100.0		

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

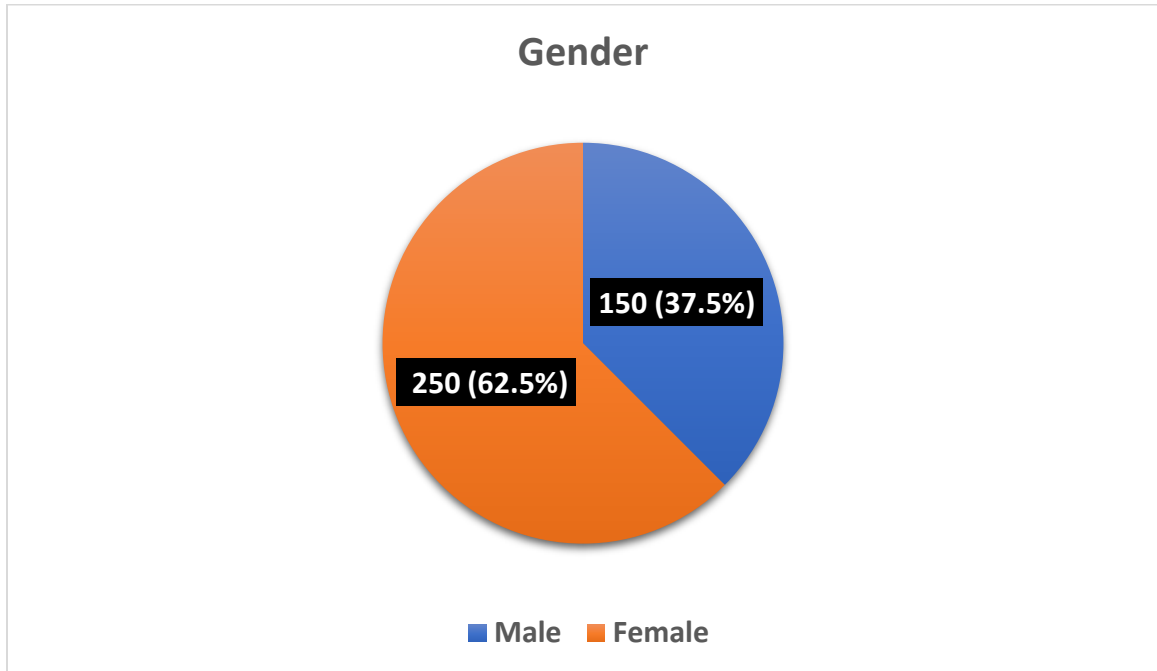


Figure 4.2. Statistics of Respondent's Gender. Developed from research

Based on Table 4.2 and Figure 4.2, it shows the gender of the respondents who took part in the research survey. Out of the total 400 respondents, 37.5% (150 respondents) are male while 62.5% (250 respondents) are female.

4.1.1.3 Age

Table 4.3:

Respondent's Age

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Age	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
18 years old to 21 years old	90	22.5	90	22.5
22 years old to 25 years old	305	76.3	395	98.8
Above 25 years old	5	1.3	400	100.0
Total	400	100.0		

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

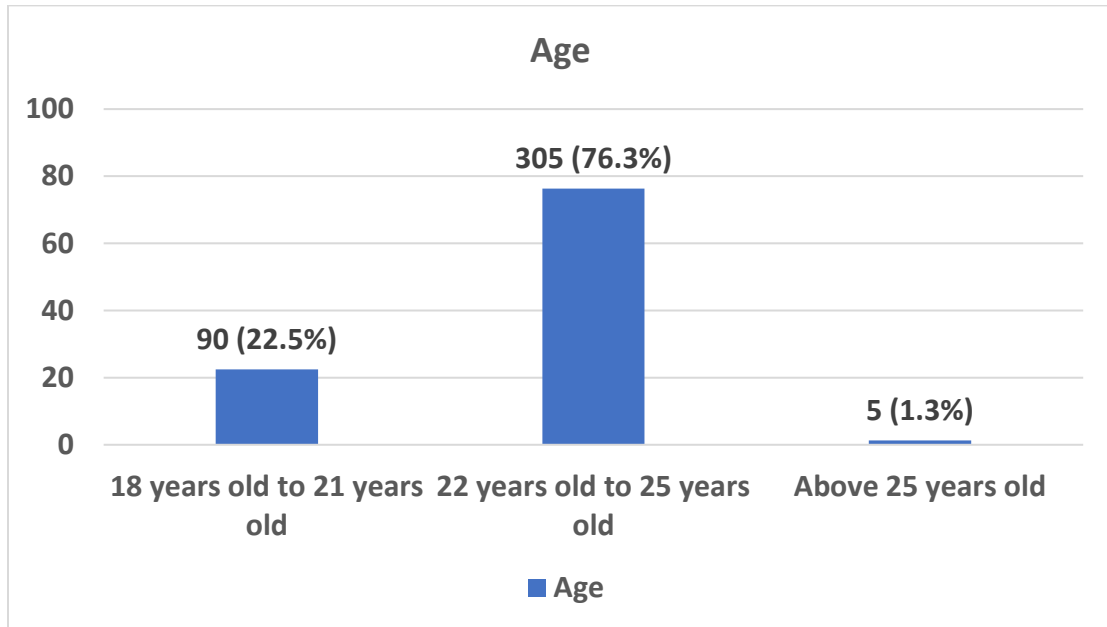


Figure 4.3. Statistics of Respondent's Age. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Based on Table 4.3 and Figure 4.3, it shows the age group of the respondents who took part in the research survey. The age group is categorized into three different groups, which are from 18 years old to 21 years old, 22 years old to 25 years old, and above 25 years old. Out of the total 400 respondents, there is 76.3% (305 respondents) are fall under the age group of 22 years old to 25 years old, 22.5% (90 respondents) are fall under the age group of 18 years old to 21 years old, and only 1.3% (5 respondents) are above 25 years old.

4.1.1.4 Year of Study

Table 4.4:

Respondent's Year of Study

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Year of Study	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Year 1	22	5.5	22	5.5
Year 2	22	5.5	44	11.0
Year 3	341	85.3	385	96.3
Above Year 3	15	3.8	400	100.0
Total	400	100.0		

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

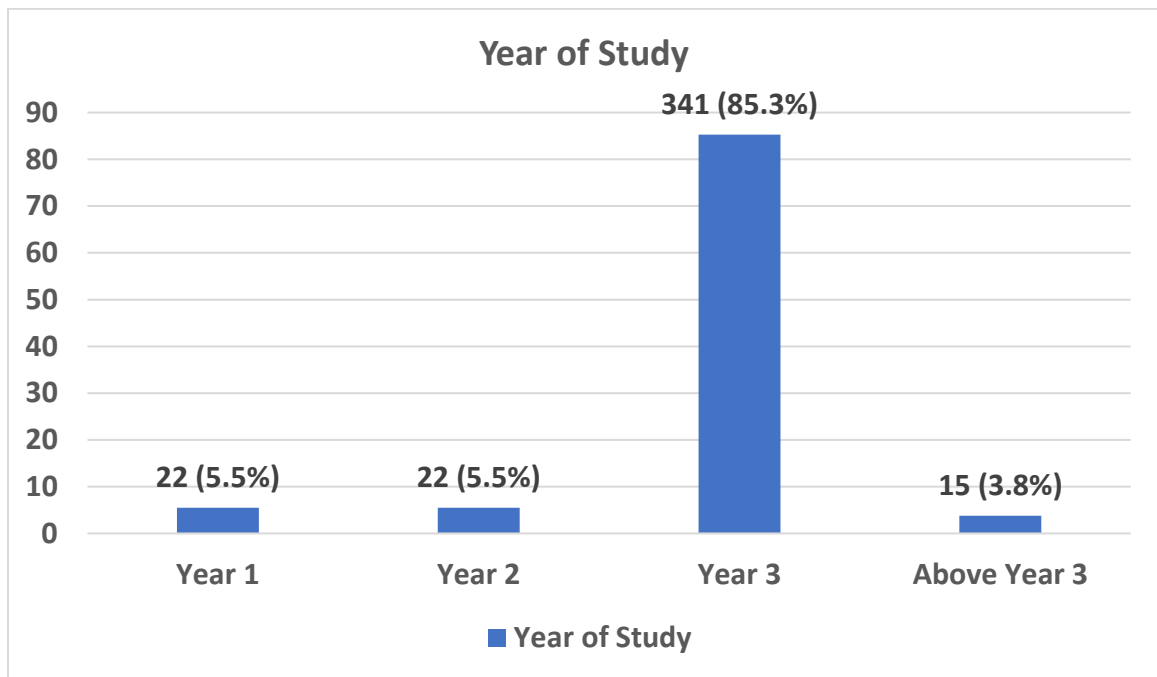


Figure 4.4. Statistics of Respondent's Year of Study. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Based on Table 4.4 and Figure 4.4, it shows the year of study of the respondents who took part in the research survey. There are a total of 400 respondents, 85.3% (341 respondents) are year 3 students, followed by year 1 and year 2 students 5.5% (22 respondents), and above year 3 students 3.8% (15 respondents).

4.1.1.5 Current Location of the Private Higher Education Institution

Table 4.5:

Respondent's Current location of the Private Higher Education Institution

Current Location of the Private Higher Education Institution	Frequency	Percentage (%)	Cumulative Frequency	Cumulative Percentage (%)
Johor	22	5.5	22	5.5
Kedah	30	7.5	52	13.0
Kelantan	18	4.5	70	17.5
Malacca	32	8.0	102	25.5
Negeri Sembilan	28	7.0	130	32.5
Pahang	7	1.8	137	34.3
Perak	42	10.5	179	44.8
Perlis	9	2.3	188	47.0

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Terengganu	17	4.3	205	51.2
Selangor	67	16.8	272	68.0
Sabah	16	4.0	288	72.0
Sarawak	11	2.8	299	74.8
Penang	45	11.3	344	86.0
Kuala Lumpur	56	14.0	400	100.0
Total	400	100.0		

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

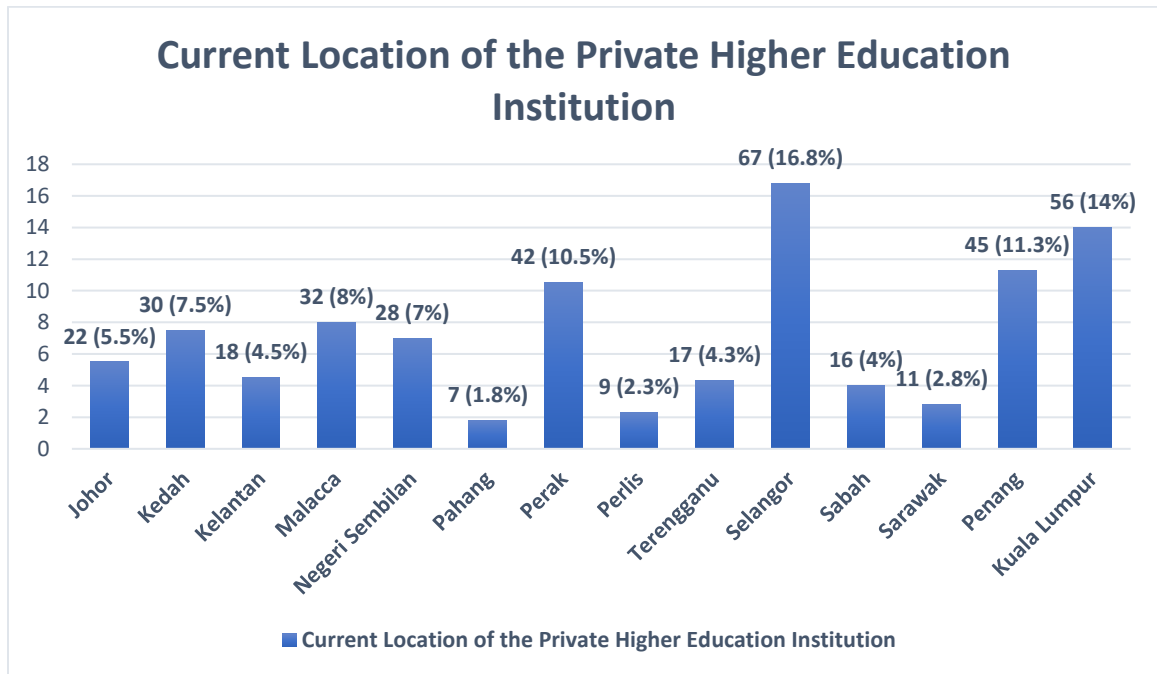


Figure 4.5. Statistics of Respondent's Current location of the Private Higher Education Institution. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Based on Table 4.5 and Figure 4.5, it shows the respondent's current location of the Private Higher Education Institution. Out of the total 400 respondents, 16.8% (67 respondents) currently studying in Selangor, 14% (56 respondents) are studying in Kuala Lumpur, 11.3% (45 respondents) are studying in Penang, 10.5% (42 respondents) are studying in Perak, 8% (32 respondents) are studying in Malacca, 7.5% (30 respondents) are studying in Kedah, 7% (28 respondents) are studying in Negeri Sembilan, 5.5% (22 respondents) are studying in Johor, 4.5% (18 respondents) are studying in Kelantan, 4.3% (17 respondents) are studying in Terengganu, 4% (16 respondents) are studying in Sabah, 2.8% (11 respondents) are studying in Sarawak, 2.3% (9 respondents) are studying in Perlis, 1.8% (7 respondents) are studying in Pahang.

4.1.2 Central Tendencies Measurement of Constructs

4.1.2.1 Student Satisfaction

Table 4.6:

Central Tendencies Measurement of Student Satisfaction

No.	Statement	Mean	Mean Ranking	Standard Deviation	Standard Deviation Ranking
SS1	I think virtual learning is a beneficial learning approach.	3.8150	4	1.08338	4

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

SS2	Virtual learning has become a positive experience for me.	3.7750	5	1.13472	2
SS3	When I am adopting an online platform in the virtual process, it fulfilled my expectations.	3.7225	6	1.22033	1
SS4	When applying to an online learning platform, it has impacted my learning approach.	4.0025	1	0.95906	6
SS5	I am satisfied with the time needed to accomplish my tasks when adopting the online platform.	3.8250	3	1.07343	5
SS6	I am satisfied when performing my tasks effortlessly by adopting online learning platforms.	3.8950	2	1.09177	3

N=400

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Table 4.6 shows the central tendencies measurement of student satisfaction. The statement of **SS4** has obtained the highest mean value which is 4.0025 but its standard deviation is obtained the lowest result which is 0.95906. Besides, **SS6** has obtained the second highest mean value which is 3.8950 and the standard deviation is 1.09177 which ranked on the third. Additionally, **SS5** has obtained the third rank of mean value 3.8250 but its standard deviation is obtained the second lowest result which is 1.07343. Moreover, **SS1** has the fourth rank for both mean and standard deviation as the mean value for **SS1** is 3.8150 and the standard deviation value is 1.08338. Furthermore, **SS2** has obtained the second lowest of mean which the mean value is 3.7750 but for the standard deviation is obtained the second rank as the standard deviation value of **SS2** is 1.13472. Apart from this, statement **SS3** obtained the lowest mean value which is 3.7225 but obtained the highest standard deviation value which is 1.22033.

4.1.2.2 Service Quality

Table 4.7:

Central Tendencies Measurement of Service Quality

No.	Statement	Mean	Mean Ranking	Standard Deviation	Standard Deviation Ranking
SQ1	I feel every online tutorial complaint is promptly addressed.	3.6350	4	1.25128	1
SQ2	I am satisfied with the solutions of the problems	3.9100	2	1.01710	3

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

provided by instructor
during the online learning
process.

SQ3	Instructor often deal with me in a caring and courteous manner.	3.8025	3	1.04701	2
SQ4	I feel that the instructor is always friendly in managing online tutorial classes.	3.9500	1	0.93792	5
SQ5	I feel that the instructor has good competence.	3.9500	1	0.97204	4

N=400

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Table 4.7 shows the central tendencies measurement of service quality. **SQ4** and **SQ5** both statements have obtained the same mean value which is 3.9500 and it is considered as the highest value of mean. However, for the standard deviation **SQ4** is 0.93792 which ranked as fifth while the standard deviation of **SQ5** is 0.97204 which ranked as the fourth. Besides, the mean value of **SQ2** is 3.9100 which ranked as the second and the standard deviation value is 1.01710 which ranked as third. Next, **SQ3** obtained the mean value of 3.8025 which ranked as third while the standard deviation value of 1.04701 which ranked as the second highest standard deviation value. Moreover, the mean value of **SQ1** is 3.6350 with the fourth ranking but for the standard deviation is the highest standard deviation value which is 1.25128.

4.1.2.3 Perceived Ease of Use

Table 4.8:

Central Tendencies Measurement of Perceived Ease of Use

No.	Statement	Mean	Mean Ranking	Standard Deviation	Standard Deviation Ranking
PEOU1	I feel online learning platforms are simple to access.	4.2025	1	0.85635	5
PEOU2	I think it is comprehensible by using online learning platforms.	4.0775	3	0.91575	4
PEOU3	When I am utilizing online learning platforms, I feel it is user-friendly.	4.0400	4	0.96474	2
PEOU4	It is simple for me to master the way to use online learning platforms.	4.1125	2	0.92030	3
PEOU5	I need less mental exertion to engage with online learning platforms.	3.6525	5	1.17695	1

N=400

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Table 4.8 shows the central tendencies measurement of perceived ease of use. **PEOU1** has the highest mean value which is 4.2025 while the value of standard deviation is 0.85635 which is the lowest standard deviation among the five statements. In addition, **PEOU4** has the mean value of 4.1125 which ranked as second while the standard deviation value is 0.92030 which ranked as third. Furthermore, **PEOU2** obtained the mean value of 4.0775 which ranked as third while the standard deviation is ranked as the second lowest as the standard deviation value is 0.91575. Besides, **PEOU3** is ranked as the second lowest of mean with the total value of 4.0400 but the standard deviation value is 0.96474 which is considered as the second highest standard deviation value. Moreover, **PEOU5** has obtained the mean value of 3.6525 which ranked as the lowest mean value among five statements but for the standard deviation is obtained the highest standard deviation value which is 1.17695.

4.1.2.4 Perceived Usefulness

Table 4.9:

Central Tendencies Measurement of Perceived Usefulness

No.	Statement	Mean	Mean Ranking	Standard Deviation	Standard Deviation Ranking
PU1	I use the virtual learning platform in my study to	4.0400	3	0.99543	4

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ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

	enable me to complete my				
	tasks more quickly.				
PU2	By using the virtual	3.7275	5	1.24181	1
	learning platform can help				
	me to improve my study				
	performance.				
PU3	I use the virtual learning	4.0525	2	1.00612	3
	platform to make it easier to				
	do my study.				
PU4	By using the virtual	4.0550	1	0.92959	5
	learning platform in my				
	study has improved my				
	efficiency.				
PU5	By using the virtual	3.8700	4	1.02749	2
	learning platform has				
	improved my knowledge				
	and study skills.				

N=400

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Table 4.9 shows the central tendencies measurement of perceived usefulness. **PU4** obtained the highest mean value which is 4.0550 but has a lower standard deviation value among the five statements which is 0.92959. Besides, the mean value of **PU3** is 4.0525 which ranked as the second and the standard deviation

value is 1.00612 which ranked as the third. Additionally, **PU1** has a mean value of 4.0400 which falls under the third rank while the standard deviation value is 0.99543 which is considered as the second lowest standard deviation value among the five statements. Moreover, the mean value of **PU5** is 3.8700 which ranked as the fourth and the standard deviation value is 1.02749 which ranked as the second. Other than that, **PU2** obtained the lowest value of mean which is 3.7275 but for the standard deviation value is obtained the highest among five statements which is 1.24181.

4.1.2.5 Information Quality

Table 4.10:

Central Tendencies Measurement of Information Quality

No.	Statement	Mean	Mean Ranking	Standard Deviation	Standard Deviation Ranking
IQ1	I feel the information provided by virtual learning is in a useful format (e.g., computer-based/webbased/game-based/AR/VR/videos/webinars).	3.9800	3	1.02088	2
IQ2	I feel the information provided by virtual	3.9500	6	0.96167	3

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

learning is easy to understand.

IQ3	I feel the information provided by virtual learning is accurate and up to date.	3.9600	5	1.03735	1
IQ4	The information provides me with sufficient content.	3.9775	4	0.93765	4
IQ5	The information provides me with useful content.	4.0825	2	0.85294	5
IQ6	I feel the information provided is related to my course.	4.2100	1	0.79529	6

N=400

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Table 4.10 shows the central tendencies measurement of information quality. **IQ6** has obtained the highest mean value which is 4.2100 but it also obtained the lowest standard deviation value which is 0.79529. Besides, the mean value of **IQ5** is 4.0825 which is considered as the second highest mean value and the standard deviation value is 0.85294 which ranked as fifth. Additionally, **IQ1** obtained the mean value of 3.9800 which ranked as third while the standard deviation value is 1.02088 which ranked as second. Furthermore, **IQ4** is ranked as fourth for both mean value and standard deviation value with the total mean

value of 3.9775 while the standard deviation is 0.93765. Next, **IQ3** obtained the second lowest mean value which is 3.9600 but with the highest standard deviation value which is 1.03735. Apart from this, **IQ2** is under the lowest rank of mean value which is 3.9500 while the standard deviation value is 0.96167 which ranked as third.

4.1.2.6 Student and Instructor Interaction

Table 4.11:

Central Tendencies Measurement of Student and Instructor Interaction

No.	Statement	Mean	Mean Ranking	Standard Deviation	Standard Deviation Ranking
SII1	The instructor did communicate adequately.	3.9500	3	1.01493	3
SII2	The instructor did concern about my learning.	3.7700	4	1.08399	2
SII3	I was able to communicate with the instructor outside of the virtual classes.	4.0500	2	0.95119	4
SII4	The instructor replied to my queries in a timely manner.	3.6550	5	1.14860	1
SII5	The instructor provided some exercises for me to	4.0550	1	0.86825	5

discuss during virtual
classes.

N=400

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Table 4.11 shows the central tendencies measurement of student and instructor interaction. **SII5** has obtained the highest mean value which is 4.0550 but the value of standard deviation is 0.86825 which is considered as the lowest standard deviation value. Besides, **SII3** obtained the mean value of 4.0500 which ranked as second while the standard deviation value is 0.95119 which is considered as the second lowest standard deviation value. Further, the mean value and standard deviation value of **SII1** is 3.9500 and 1.01493 respectively which both also ranked as the third. Moreover, the mean value of **SII2** is 3.7700 which ranked as fourth while the standard deviation is 1.08399 which ranked as second. Lastly, **SII4** has obtained the lowest mean value among five statements which is 3.6550 but for the standard deviation is obtained the highest standard deviation value which is 1.14860.

4.2 Scale Measurement

SPSS Software (version 28) has been utilized in this study for reliability analysis to investigate the dependent variable (student satisfaction) and independent variables (service quality, perceived ease of use, perceived usefulness, information quality, student and instructor interaction). There were total 400 sets of questionnaires are gathered and using to conduct the reliability analysis.

4.2.1 Reliability Analysis

Cronbach's Alpha was utilized to determine the reliability of each variable during the reliability assessment. The reliability test is conducted to assess the consistency and reliability of each variable included in our study.

Table 4.12:

Cronbach's Alpha Reliability Test

	Number of Items	Cronbach's Alpha Value	Result of Reliability
Dependent Variable:			
Student Satisfaction	6	0.914	Excellent
Independent Variable:			
Service Quality	5	0.813	Very Good
Perceived Ease of Use	5	0.834	Very Good
Perceived Usefulness	5	0.868	Very Good
Information Quality	6	0.831	Very Good
Student and Instructor Interaction	5	0.776	Good

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

Table 4.12 shows the result of the reliability test for the research. According to table 4.12, the Cronbach's Alpha value of the dependent variable (student satisfaction) is 0.914 which has the highest Cronbach's Alpha value. Besides, the

Cronbach's Alpha value of the independent variables perceived usefulness is (0.868), followed by perceived ease of use (0.834), information quality (0.831), service quality (0.813), and student and instructor interaction (0.776) which obtain the lowest value of Cronbach's Alpha. Further, the Cronbach's Alpha value of student satisfaction is falls under the range of more than 0.9, then it considered as excellent reliability. As the Cronbach's Alpha value for other variables which are service quality, perceived ease of use, perceived usefulness, and information quality falls within the range of 0.8 to 0.9, thereby, all of these variables are indicated as very good reliability. However, for the variables of student and instructor interaction are indicated as good reliability as the value of Cronbach's Alpha is fall under the range of 0.7 to 0.8.

4.3 Inferential Analysis

In order to analyze the samples and come to a conclusion about the data, descriptive analysis will not be enough. Therefore, Inferential analysis compares treatment groups and draws inferences about the greater population of trial participants using metrics from the sample of patients in the study (Kuhar, 2010).

Inferential analysis generates assumptions about the wider population based on the research sample. Therefore, when working with inferential statistics, it is vital to use random and fair sampling processes. Inferential analysis able to draw reliable statistical judgments as well, if the research sample is not typical of the population (Bhandari, 2020).

4.3.1 Pearson Correlation Coefficient

The Pearson correlation coefficient is able to identify how independent and dependent variables are related. According to Rousseau (2018), Pearson correlation coefficient is a linear relationship measurement that can be extremely sensitive to outliers. It is a reliable measurement to measure the association between variables using linearity. Correlation is the capacity to interpret the degree of relationship between dependent and independent variables.

4.3.1.1 Service Quality and Student Satisfaction

H1: There are significance relationship between service quality and student satisfaction.

Table 4.13:

Correlation between Service Quality and Student Satisfaction

		Service Quality	Student Satisfaction
Service Quality	Pearson Correlation	1	0.699
	Sig. (2-tailed)		<0.001
	N	400	400
Student Satisfaction	Pearson Correlation	0.699	1
	Sig. (2-tailed)	<0.001	
	N	400	400

** Correlation is significant at the 0.01 level (2-tailed)

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

The correlation between service quality and student satisfaction is 0.699, according to the table. It also demonstrates that the correlation value is positive. Thus, it appears that service quality has a positive relationship with student satisfaction. The correlation value of 0.699 falls between the correlation range of 0.41-0.70 when assessing the strength of association. Therefore, it may interpret as moderate relationship between service quality and student satisfaction. To summarize, the greater the service quality, the better the student satisfaction is with virtual learning.

4.3.1.2 Perceived Ease of Use and Student Satisfaction

H2: There are significance relationship between perceived ease of use and student satisfaction.

Table 4.14:

Correlation between Perceived Ease of Use and Student Satisfaction

		Perceived Ease of Use	Student Satisfaction
Perceived Ease of Use	Pearson Correlation	1	0.662
	Sig. (2-tailed)		<0.001
	N	400	400
Student Satisfaction	Pearson Correlation	0.662	1
	Sig. (2-tailed)	<0.001	
	N	400	400

** Correlation is significant at the 0.01 level (2-tailed)

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

According to the table, it appears 0.662 correlation value is between perceived ease of use and student satisfaction. The perceived ease of use correlation value is likewise a positive value. As a result, it was discovered that perceived ease of use correlates with student happiness. The correlation value of 0.662 lies between the range of 0.41-0.70, which use to determine the strength of the association. Thus, it indicates that there was a moderate relationship existed between perceived ease of use and student satisfaction. In conclusion, the more the perceived ease of use of virtual learning, the higher the student satisfaction with virtual learning.

4.3.1.3 Perceived Usefulness and Student Satisfaction

H3: There are significance relationship between perceived usefulness and student satisfaction.

Table 4.15:

Correlation between Perceived Usefulness and Student Satisfaction

		Perceived Usefulness	Student Satisfaction
Perceived Usefulness	Pearson Correlation	1	0.700
	Sig. (2-tailed)		<0.001
	N	400	400
Student Satisfaction	Pearson Correlation	0.700	1
	Sig. (2-tailed)	<0.001	
	N	400	400

** Correlation is significant at the 0.01 level (2-tailed)

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

According to the table, the correlation between perceived usefulness and student satisfaction is 0.700, with a positive correlation value for perceived usefulness. As a result, it was discovered that perceived usefulness had a positive relationship with student satisfaction. The correlation value of 0.700 lies between the correlation range of 0.41-0.70 when looking at the strength of association. Hence, perceived usefulness and student satisfaction have a moderate relationship. Conclusively, the more the perceived usefulness of virtual learning, the higher the student satisfaction with virtual learning.

4.3.1.4 Information Quality and Student Satisfaction

H4: There are significance relationship between information quality and student satisfaction.

Table 4.16:

Correlation between Information Quality and Student Satisfaction

		Information Quality	Student Satisfaction
Information Quality	Pearson Correlation	1	0.538
	Sig. (2-tailed)		<0.001
	N	400	400
Student Satisfaction	Pearson Correlation	0.538	1
	Sig. (2-tailed)	<0.001	

N 400 400

** Correlation is significant at the 0.01 level (2-tailed)

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

The correlation value between information quality and student satisfaction is 0.538, according to the table. The information quality correlation coefficient is generally positive. Hence, information quality has a positive correlation with student satisfaction. The correlation value of 0.538 lies between the correlation range of 0.41-0.70 in terms of association strength. Therefore, information quality and student satisfaction have a moderate relationship. Thus, the greater the information quality offered, the more the student satisfaction is with virtual learning.

4.3.1.5 Student and Instructor Interaction and Student Satisfaction

H5: There are significance relationship between student and instructor interaction and student satisfaction.

Table 4.17:

Correlation between student and instructor interaction and Student Satisfaction

		Student and Instructor Interaction	Student Satisfaction
Student and Instructor Interaction	Pearson Correlation	1	0.636
	Sig. (2-tailed)		<0.001
	N	400	400

Student Satisfaction	Pearson Correlation	0.636	1
	Sig. (2-tailed)	<0.001	
	N	400	400

** Correlation is significant at the 0.01 level (2-tailed)

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

The correlation value between student and instructor interaction and student satisfaction is 0.636, as seen in the table above. Furthermore, as shown, the correlation value of student and instructor interaction is positive. As a result, student satisfaction and student and instructor interaction have a positive relationship. The correlation value of 0.636 lies between the correlation range of 0.41-0.70, which may be used to determine the strength of the association between student and instructor interaction and student satisfaction. Thus, student satisfaction and student and instructor interaction have a moderate relationship. Finally, the better the relationship between student and instructor, the more the student satisfaction with virtual learning.

4.3.2 Multiple Linear Regression

An approach for understanding the relationship between dependent and independent variables is multiple linear regression. It is the same idea as basic linear regression, but it is used for a greater number of factors, such as research with multiple independent variables, moderating, and mediating variables. The term 'linear' describes the researchers' assumption about the relationship between independent and dependent variables (Tranmer and Elliot, 2008). They have a tendency to assume that independent and dependent variables are proportionately

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

connected. Using this method, researchers may determine the importance of dependent and independent variables by calculating the p-value.

Table 4.18:
Analysis of Variance (ANOVA)

Model	Sum of Squares	df	Mean Square	F	Sig
Regression	208.174	5	41.635	128.905	<0.001
Residual	127.257	394	0.323		
Total	335.431	399			

- a. Dependent Variables: Student Satisfaction Average
 - b. Predictors (constant), Student and Instructor Interaction Average, Information Quality Average, Perceived Ease of Use Average, Perceived Usefulness Average, Service Quality Average
- Note.* Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

H6: All independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction) significantly influence the dependent variable (student satisfaction).

To begin with, this method accurately describes the relationship between dependent and independent variables. The P-value (significant value) in the aforementioned analysis of variance (ANOVA) is 0.001, which is less than the alpha value of 0.05. The P-value of 128.905 also persuaded the researchers that the F-value of 128.905 is significant. As a result, it may be inferred that the alternative hypothesis is supported and the correlation has been proven. All of the independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction) are

significant in evaluating the variance in the dependent variables (student satisfaction).

Table 4.19:

Model Summary of R-Square

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	0.788	0.621	0.616	0.56832

- a. Predictors: (constant), Student and Instructor Interaction Average, Information Quality Average, Perceived Ease of Use Average, Perceived Usefulness Average, Service Quality Average

Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

The correlation and coefficient between independent and dependent variables may be explained using the R-value. We may analyze the statement by its proportion and extent to explain the correlation and coefficient. The R-value in this study is 0.788, which is a positive number, according to the model described above. As a result, there is a strong and positive relationship between independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction) and dependent variables (student satisfaction).

Researchers can use the R-square to determine the amount or percentage of the variability in the dependent variables can be explained by the independent variables. The R-square for the above result is 0.621, which equates to 62.1%. As a result, the independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction) can explain 62.1% of the variations in dependent variables (student satisfaction).

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Despite this, 37.9% (100%) of the data in this study remained unexplained. As a consequence, we may conclude that other important and supplementary variables in describing student satisfaction were not included in this study.

Table 4.20:
Parameter Estimates

Model	Unstandardized Coefficients B	Std. Error	Standardized Coefficients Beta	t	Sig.
(constant)	-0.419	0.187		-2.234	0.026
Service Quality	0.313	0.057	0.271	5.477	<0.001
Perceived Ease of Use	0.262	0.056	0.216	4.715	<0.001
Perceived Usefulness	0.287	0.053	0.265	5.422	<0.001
Information Quality	0.092	0.054	0.069	1.708	0.089
Student and Instructor Interaction	0.127	0.059	0.103	2.154	0.032

a. Dependent Variables: Student Satisfaction Average
Note. Data generated and retrieved from Statistical Package of Social Sciences (SPSS)

We may infer that the independent variable of service quality has a significant relationship with the dependent variables of student satisfaction as referred on the coefficients finding provided in Table 4.20. Because the p-value (significant value) is smaller than the alpha value of 0.05, the p-value (significant value) is <0.001. Furthermore, both perceived ease of use and perceived usefulness have a mutual p-value of <0.001, which, similar to service quality, is lesser than the alpha value of 0.05. Therefore, perceived ease of use and perceived usefulness have a significant relationship with student satisfaction. The following independent variable, student and instructor interaction, has a p-value of 0.032 that is lower than the alpha value of 0.05. As a result, the relationship between the student and instructor and student satisfaction has a significant relationship. The conclusion revealed a p-value of 0.089 for the independent variables of information quality, which is greater than the alpha value of 0.05. Conclusively, information quality has no relationship with student satisfaction.

Multiple Linear Regression Equation

$$Y = a + b_1(X_1) + b_2(X_2) + b_3(X_3) + b_4(X_4) + b_5(X_5)$$

Y= Dependent variable (Student Satisfaction)

a= Constant value

b= Unstandardized coefficient

X₁= Independent variable (Service Quality)

X₂= Independent variable (Perceived Ease of Use)

X₃= Independent variable (Perceived Usefulness)

X₄= Independent variable (Information Quality)

X₅= Independent variable (Student and Instructor Interaction)

$$\text{Student Satisfaction} = -0.419 + 0.313 (\text{Service Quality}) + 0.262 (\text{Perceived Ease of Use}) + 0.287 (\text{Perceived Usefulness}) + 0.092 (\text{Information Quality}) + 0.127 (\text{Student and Instructor Interaction})$$

Table 4.21:
Standardized Coefficients Beta and Ranking

Independent Variables	Standardized Coefficients Beta	Ranking
Service Quality	0.271	1 st
Perceived Usefulness	0.265	2 nd
Perceived Ease of Use	0.216	3 rd
Student and Instructor Interaction	0.103	4 th
Information Quality	0.069	5 th

Note. Standardized Coefficients Beta generated from SPSS

According to the table above, because its Beta value of 0.271 is the highest among the independent variables, service quality is the independent variable that contributes the most to the variance of the dependent variables (student satisfaction). When the variance represented by the other independent variables in the model is taken into account, it can be shown that service quality contributes the most to explaining the variance in the dependent variable (student satisfaction).

Then, due to perceived usefulness having the Beta value is 0.265, the second-largest among the independent variables, it was determined to have the second-largest contribution to the variance of the dependent variable (student satisfaction). After all other predictor variables in the model have been taken into account, perceived usefulness represents the second-largest unique contribution to explaining the variance in the dependent variable (student satisfaction).

Furthermore, since the Beta value calculated above is 0.216, the third-largest among the independent variables, perceived ease of use is the independent variable with the third-highest variation in the dependent variable (student satisfaction). After entire independent variables in the model have been taken into account, perceived ease of use contributes the third unique contribution to describe the variance in the dependent variable (student satisfaction).

With a Beta value of 0.103, the fourth-largest among the independent variables, student and instructor interaction is the fourth most important factor in predicting the variance of the dependent variable (student satisfaction). When all independent variables in the model are taken into account, student and instructor interaction gives the fourth-highest unique contribution in describing variance in the dependent variable (student satisfaction).

Last but not least, information quality is the independent variable that contributes the least to the variance of the dependent variable since the Beta value of 0.069 is the smallest among the independent variables (service quality, perceived ease of use, perceived usefulness, information quality, and student and instructor interaction). When all independent variables in the model's variance are taken into account, information quality contributes the least to explaining the variation in the dependent variable (student satisfaction).

4.4 Conclusion

To summarize, every one of the data was collected and analyzed in this chapter using a few methods, including inferential analysis, reliability analysis, descriptive analysis, Pearson correlation coefficient, and multiple linear regression, to figure out the correlation and variation among both dependent and independent variables. All of the data was analyzed using the SPSS system, which can provide numerical results and present a conclusion to this study. It can also produce results in order to determine the hypothesis or assumption made and meet the study's research objective. Last but not least, in Chapter 5, there will be more discussion and implications for the investigation.

CHAPTER 5: DISCUSSION, CONCLUSION AND IMPLICATIONS

5.0 Introduction

The purpose of this chapter 5 is to present the overview of the discussion and conclusion based on the whole research project that had been carried out. Firstly, the researchers will summarize the statistical analysis that was obtained and analyzed from the previous chapter which includes descriptive analysis and inferential analysis. Besides, this chapter will address the main findings and implications of this research. Further, the researchers will also explain the research's limitations and provide several useful recommendations for future research. Moreover, the overall conclusion also will be delivered by researchers.

5.1 Summary of Statistical Analysis

5.1.1 Summary of Descriptive Analysis

Table 5.1:

Summary of Descriptive Analysis

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Variable	Frequency	Percentage (%)	Cumulative frequency	Cumulative Percentage (%)
Gender				
Male	150	37.5	150	37.5
Female	250	62.5	400	100.0
Age Group				
18 years old to 21 years old	90	22.5	90	22.5
22 years old to 25 years old	305	76.3	365	98.8
Above 25 years old	5	1.3	400	100.0
Year of Study				
Year 1	22	5.5	22	5.5
Year 2	22	5.5	44	11.0
Year 3	341	85.5	385	96.3
Above Year 3	15	3.8	400	100.0
Current Location of the Private Higher Education Institution				
Johor	22	5.5	22	5.5
Kedah	30	7.5	52	13.0
Kelantan	18	4.5	70	17.5
Malacca	32	8.0	102	25.5
Negeri Sembilan	28	7.0	130	32.5
Pahang	7	1.8	137	34.3

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Perak	42	10.5	179	44.8
Perlis	9	2.3	188	47.0
Terengganu	17	4.3	205	51.2
Selangor	67	16.8	272	68.0
Sabah	16	4.0	288	72.0
Sarawak	11	2.8	299	74.8
Penang	45	11.3	344	86.0
Kuala Lumpur	56	14.0	400	100.0

Note. Developed for the research

In summary, 400 people completed the questionnaire survey for this study. According to the research results in Chapter 4, the majority of respondents is 62.5% were female. The number of respondents in this survey are between the ages of 22 and 25 which is 76.3%. The majority of respondents in this study area are from Year 3 respondents which consist of 85.5% of the 400 respondents. At last, the majority of respondents which is 16.8% are from the state of Selangor.

5.1.2 Summary of Inferential Analysis

5.1.2.1 Reliability Test

For the reliability test, 400 sets of questionnaires were distributed. The results for independent variables (service quality, perceived ease of use, perceived

usefulness, student and instructor interaction, and information quality) and dependent variable (student satisfaction) are greater than 0.9. The coefficient alpha value of student satisfaction is 0.914 for the dependent variable, while perceived usefulness has the largest coefficient alpha value with 0.868 among the independent variables. Next, the second-largest coefficient alpha value is perceived ease of use with 0.834 for the independent variable. Furthermore, the third-largest coefficient alpha value is information quality with 0.831. The fourth-largest coefficient alpha value is service quality with 0.813. Lastly, the student and instructor interaction has the coefficient alpha value of 0.776.

5.1.2.2 Pearson Correlation Coefficient Analysis

In Chapter 4, the Pearson Correlation Coefficient test reveals that there is a significant relationship between the independent variables (service quality, perceived ease of use, perceived usefulness, student and instructor interaction, and information quality) and the dependent variable (student satisfaction).

However, due to the correlation coefficient is positive, there is a positive relationship between the independent variables (service quality, perceived ease of use, perceived usefulness, student and instructor interaction, and information quality) and the dependent variable (student satisfaction). Based on the Pearson Correlation Coefficient test, the R-value for service quality is 0.669. Perceived ease of use has an R-value of 0.662, while perceived usefulness has an R-value of 0.700. Furthermore, information quality has an R-value of 0.538, and student and instructor interaction has an R-value of 0.636. As a result, student satisfaction is high when the independent variable (service quality, perceived ease of use, perceived usefulness, student and instructor interaction, and information quality) is high.

According to table 4.15, the correlation coefficient of the variables in this study falls within the range of ± 0.41 to ± 0.70 . As a result, the relationship between the dependent variable (student satisfaction) and the independent variables (service quality, perceived ease of use, perceived usefulness, student and instructor interaction, and information quality) is moderate.

The dependent variable (student satisfaction) has a significant relationship with the independent variables (service quality, perceived ease of use, perceived usefulness, student and instructor interaction, and information quality). This is because the p-value (0.000) is less than the alpha value.

5.1.2.3 Multiple Linear Regression Analysis

The F-statistic is significant because the p-value (< 0.000) is less than the alpha value of 0.05. Therefore, the service quality has its p-value of < 0.001 ; perceived ease of use was < 0.001 ; perceived usefulness was < 0.001 ; information quality was 0.089, while student and instructor interaction was 0.032. This means that the relationships between student and instructor interaction, perceived ease of use, perceived usefulness, service quality, and information quality towards student satisfaction are significant. Besides, the R-square value is 0.621, indicating that the independent variables for this study, which include service quality, perceived ease of use, perceived usefulness, student and instructor interaction, and information quality, can explain 62.1% of the variation with the dependent variable which is student satisfaction.

5.2 Discussion of Major Findings

The computed result of the test will be used by researchers to determine the status of the hypothesis. When the R-value is positive, there is a positive relationship between the independent and dependent variables. Therefore, the p-value can be used to determine whether a hypothesis should be accepted or rejected. However, the p-value can assist in determining whether to accept or reject a hypothesis. When the p-value is less than 0.05 ($p < 0.05$), the alternate hypothesis (H1) is accepted, and the null hypothesis (H0) is rejected.

Table 5.2:

The Summary of Pearson's Correlation Coefficient and Multiple Linear Regression for the Independent Variables and Student Satisfaction

	Hypothesis	Result	Outcomes
H1	There is a significant relationship between service quality with student satisfaction.	R-value = 0.669 p-value = <0.000 (p-value = <0.001)	Supported
H2	There is a significant relationship between perceived ease of use with student satisfaction.	R-value = 0.662 p-value = <0.000 (p-value = <0.001)	Supported

H3	There is a significant relationship between perceived usefulness with student satisfaction.	R-value = 0.700 p-value = <0.000 (p-value = <0.001)	Supported
H4	There is a not significant relationship between information quality with student satisfaction.	R-value = 0.538 p-value = <0.000 (p-value = 0.089)	Not Supported
H5	There is a significant relationship between student and instructor interaction with student satisfaction.	R-value = 0.636 p-value = <0.000 (p-value = 0.032)	Supported

Note. Developed for the research

5.2.1 Hypothesis 1: Service Quality and Student Satisfaction

The outcomes have indicated that no matter the service quality of university or instructors also have significant impact on student satisfaction with virtual learning during COVID-19. The result from our study is aligned with Zaheer et al. (2015), student satisfaction with virtual learning can be enhanced when the instructor responds to them in a timely manner, provide clear instructions for course requirements, support their students' work, provide useful information and

many more. Not only that, as Darawong and Sandmaung (2019) stated that service quality includes educational support facilities, educational experience, educational quality, services that provided by the university's faculty, interactions, and management quality have significant effect on student satisfaction.

In order for students to be satisfied with virtual learning, then it is required for the university to identify the virtual learning service quality criteria that recognized by students. After identifying those criteria, the university can take applicable steps to strengthen the service quality of virtual learning in order to attain student satisfaction. There were six essential service quality criteria that were recognized by students which involve trust, interaction, ease of use, materials of web browsers, reliability as well as service speed. Other than that, course design as well as the assistance along with administrative services also can affect the student satisfaction with virtual learning (Darawong & Sandmaung, 2019). A study from Tj and Tanuraharjo (2020) used some virtual learning service quality criteria that include system, instructors along with course contents, and administrative as well as assistance in order to test the student satisfaction. Results had proofed that service quality of virtual learning has significant effect on student satisfaction. Therefore, universities can identify quality service criteria that are perceived by students first, then only carry out proper steps to enhance the virtual learning service quality so that able to gain students' satisfaction with virtual learning.

5.2.2 Hypothesis 2: Perceived Ease of Use and Student Satisfaction

The assumption is affirmed by the study results, which indicate that perceived ease of use has a critical contribution to student satisfaction. It can be assumed from the data that using remote learning platforms effortlessly are critical for student satisfaction throughout the pandemic period. The results of this research are similar to earlier studies, Islam (2020) and Arbaugh (2018). Furthermore, students have been encouraged to engage in social distance, with the recommendation that most educational institutions ought to embrace virtual learning and educators should be motivated to adopt such platforms more efficiently (Karim et al., 2021).

As claimed by Tahar et al. (2020), a platform is recognized as outstanding quality if it is built to deliver user satisfaction via ease of use; this involves not merely the simplicity of learning and utilizing the platform, but how easy conducting a work, in which users will perceive it simpler to perform with the platform rather than manually. The platform's perceived ease of use has contributed to its performance risk. Performance risks are minimized when a platform is less sophisticated. When users believe the platform is simple to apply can performance issues be reduced (Abdul Hamid et al., 2016). According to certain research, the perceived simplicity of using the platform influenced the intention to employ it (Tahar et al., 2020).

Whenever students experience satisfaction, they are less inclined to be concerned about utilizing the platform. Once individuals perceive enjoyment, they are less prone to generate judgments of ease of use (Huang et al., 2020). Alternatively, individuals might believe that using the platform is effortless. These varieties of programs media can increase perceptions of satisfaction and also reduce the notion that accessing the platform is a problem (Dwidienawati et al., 2020).

5.2.3 Hypothesis 3: Perceived Usefulness and Student Satisfaction

According to the previous findings, perceived usefulness has a significant influence on student satisfaction, which is relevant to the finding of Alsabawy et al., (2016). Therefore, the findings have suggested that the students are more satisfied with the virtual learning platform when they perceive it is simple to use and provides them with useful information. Safsouf, Mansouri, and Poirier (2020) also highlighted that the students who satisfy with virtual learning will be useful in their studies. Perceived usefulness of virtual learning platform the student can use the virtual learning platform in their study to complete their tasks more quickly, due to it plays as the most attractive factor for the student's satisfaction of using this online platform.

According to Keržič et al. (2019), when the students use the e-learning platform can be improved their study efficiency, they will like using virtual learning and will achieve better grades as a result. Moreover, perceived virtual learning's usefulness will be more effective and beneficial virtual learning for students studying for their final exams. When a student has a good virtual learning platform, it indicates that the student is achieving a specific result.

5.2.4 Hypothesis 4: Information Quality and Student Satisfaction

The finding shows that the information quality is significantly influenced student satisfaction. The outcome of Zaili et al. (2019) in the previous research shows that information quality is a significant influence by student satisfaction. After we run for our result, we found out that the information quality is not significantly influenced by student satisfaction.

Chandra and Napitupulu (2021) show that the information quality is not significant influence by student satisfaction. For the student, the most significant factors are strong responsiveness and interaction, as well as easy access to e-learning; as a result, they may believe that information quality is less relevant (Dwidienawati et al., 2020). The results in Ching and Maarof (2021) show that the information quality is not significant in student satisfaction. This could be explained by the fact that in Malaysia, students from various cultural and educational backgrounds have different requirements and expectations than students from other industrialized countries. The degree of self-control displayed by the students may determine the volume and depth of knowledge or resources necessary. To solve this, instructors should create teaching approaches that include materials that encourage students to engage in self-directed learning and be self-sufficient in their search for new resources to aid their studies.

5.2.5 Hypothesis 5: Student and Instructor Interaction and Student Satisfaction

The result that had been run indicated that student and instructor interaction has significant impact on student satisfaction with virtual learning during COVID-19. Student and instructor interaction includes several actions such as instructors giving feedback to students, instructors interact with students to get to know their needs, instructors answer to students' questions, having online discussions, and many more. The result from our study is aligned with some researchers such as Gopal et al. (2021) found that students will be satisfied when there is good interaction with the instructor. Croxton (2014) also stated that instructor gives comments to students in a timely manner as well as instructor along with students get to know each other have significant influence on student satisfaction. Besides,

Alqurashi (2019) also mentioned that students will have high satisfaction as well as rate of perceived learning when they have high quality along with the number of communications with their instructor.

As an example, students may prefer their instructors to reply to their questions or give some comments on their work as soon as possible to prevent them from delaying their work. Based on Després-Bedward, Avery, and Phirangee (2018), students that have experienced slow replies and less concern from their instructors will be less satisfied, whereas students will be more satisfied if their instructors reply to them in a timely manner and show more concern on them. Therefore, it is better for instructors to have fast responses and more interaction with their students in order for the students to have better learning outcomes and lastly lead to satisfaction with virtual learning (Baber, 2020). For examples, the instructors can have online discussions during the class, respond to their students in a timely manner, be more concerned on their student's learning such as asking whether they understand the syllabus or not and so on.

5.3 Implications of the Study

5.3.1 Theoretical Implications

According to our research, our framework includes a dependent variable which is student satisfaction along with five independent variables that involve service quality, perceived ease of use, perceived usefulness, information quality as well as student and instructor interaction. Because there has a little research on student

satisfaction with virtual learning during COVID-19 in private higher education institutions in Malaysia, thus some future research may refer to this study as one of the references in order to get some valuable results. Due to this COVID-19 outbreak, most of the students were needed to have virtual learning instead of face-to-face learning. Hence, some researchers may conduct research on factors that can affect student satisfaction with virtual learning in order to help private higher education institutions in Malaysia to enhance their student satisfaction with virtual learning. Based on our results, all independent variables except for information quality have significant influence on student satisfaction. Therefore, researchers can use our findings as a reference to develop their research studies.

5.3.2 Managerial Implications

During this COVID-19 outbreak, students are compelled to attend online classes rather than traditional learning to prevent the virus's spread. Therefore, student satisfaction has become a very important element during virtual learning because as Ghaderizefreh and Hoover (2018) stated that positive attitudes like satisfaction significantly impact on the performance of students as well as self-regulated learning practices, but if there is a negative attitude like boredom can cause to have a negative impact on both of it. In other words, student satisfaction can affect their own learning experience and learning outcome.

This study has found that four independent variables (service quality, perceived ease of use, perceived usefulness along with student and instructor interaction) except information quality have significant impact on student satisfaction with virtual learning. Therefore, management of those private higher education institutions in Malaysia can focus on these four independent variables in order to improve their student satisfaction with virtual learning.

For service quality, it includes services that are offered by the university or services offered by the administrative staff along with the interaction between students and instructors. To enhance student satisfaction with virtual learning, instructors can communicate more (Alqurashi, 2019) and respond to their students in a timely manner (Croxtton, 2014). Besides, as Li et al. (2018) stated that universities can offer training to their staffs to enhance their communication with the students so that they can truly comprehend the students' needs as well as expectations. Furthermore, to raise the staff's willingness as well as preparedness to assist along with respond to students' queries, the staff's awareness of duty should be increased.

Other than that, instructors can improve the information quality that provides to students by choosing third-party illustrations, case studies as well as previous experiences as examples. This is because it can assist students in learning the way to apply what they have learned in the class to real-world situations (Martin, 2019). In addition, the university can pay more attention to the student user experience and review if the online learning platform is prepared with many course contents, user friendly as well as easy to use to improve the students' perceived ease of use along with perceived usefulness which can lead to student satisfaction with virtual learning (Shao, 2019). Therefore, universities can collect feedback from students to get to know the shortcomings of online learning platforms.

5.4 Limitations of the Study

We were still adapting to the emergence of the COVID-19 pandemic when performing this research paper, hence resulting in us having faced few constraints. The major issue was that we were hard to interview or so-called meet up with each of the respondents due to the practice of social distancing. First and foremost, we might not be able to ensure that the inquiries that come from the respondent can be effectively answered. There was the possibility that some respondents would have inquiries regarding our questionnaire or research e.g., any specific term, research idea, etc. The nature of the student pursuing university e.g., public or private university also considered one of our constraints encountered during the questionnaire distribution. Some of the students might fail to identify the nature of university studying, and therefore we were unable to confirm that all the respondents were our targeted respondents.

In addition, lack of confidence in researchers is the following factor that might affect the research conduct. This is due to face-to-face communication being absent in the pandemic situation and it might result that the respondents lacking confidence in our conduct. We also found out that the respondent might fill up the questionnaire in a random manner, by choosing 'Neutral'. It might be assumed that the lack of confidence regarding the professional has derived from the respondent's lack of patience in filling up the questionnaire. All these minor constraints might also cause our study to have inaccurate data. As mentioned, the outbreak of the pandemic has restricted us to ensure each of the respondents from different states of the university has equal chances to participate in this research. This situation might cause this research conducted in an unintended biases approach. We also found out that we were hard to reach the target sample size. Since the distribution was online, it might easily be ignored by the respondent. Fortunately, it does not cause any delay in our progress especially the data insert into SPSS.

This study also demonstrates a limitation that the value of reference might be absent while the pandemic comes to an end. We are hard to ensure that there is still value as

reference or contribution when students switch back to the normal academic learning mode, the physical mode.

5.5 Recommendations for Future Research

As we still coping with the COVID-19 pandemic, it is proposed that the questionnaire is able to be distributed to other private higher university executives through email. It can be ensured that a substantial amount of respondents can be reached. To describe in more detail, there is also a briefing session that can be held before letting the respondents fill up the questionnaire. The briefing session can be a formal briefing session through online. Thus, it is able to solve the concerns of social distancing, cost and time effectiveness, and sample size.

Besides that, a list can be prepared for the students regarding the nature of each of the universities within Malaysia. The respondents might be able to identify their nature of pursuing university before filling up the questionnaire. Hence, most of the potential respondents can be effectively targeted. As mentioned, the formal briefing session is suggested, and it is one of the initiatives to improve the confidence and patience of the respondents towards researchers. It provides assertiveness to the respondents through intercommunication. Thus, the random manner to fill up a questionnaire can be minimized.

As it is a relatively distinctive opportunity for higher education institution students in Malaysia to experience virtual learning mode, it is recommended that future studies strengthen the importance of virtual learning where it might the academic learning mode which brings uncountable welfare in the educational aspect and therefore required more research study to explore it.

5.6 Conclusion

Summed up the data and information of what researchers had just outlined above, researchers can draw the conclusion that service quality, perceived ease of use, perceived usefulness, and student and instructor interaction have a significant relationship with student satisfaction towards virtual learning. However, information quality has been discovered that it has no significant relationship with student satisfaction with virtual learning. In order to indicate the result, researchers evaluated the analysis (descriptive and inferential) and provided findings to support the analysis. Following that, researchers examine the overall findings and draw conclusions about the hypothesis and research objectives. As a result, researchers have identified the factors that may influence student satisfaction with virtual learning. The researchers then offer suggestions on how to use the factors and how they may be enhanced.

Furthermore, whereas the majority of studies have shown that information quality is the most significant element impacting student satisfaction with virtual learning, this was not the case in our research. Hence, it has emerged as a new research gap in this area. This new research gap may need a more in-depth investigation and explanation in order to discover why information quality is not relevant. As a result, this research contributes to the maintenance or enhancement of student satisfaction with virtual learning. Thus, the findings of this study might be used by the school sector to improve or strengthen the virtual learning that has been developed in response to the Covid-19 pandemic.

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ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

APPENDICES

Appendix 1: Certification Letter



UNIVERSITI TUNKU ABDUL RAHMAN DU012(A)

Wholly owned by UTAR Education Foundation (200201010564(578227-M))

Faculty of Business and Finance
Jalan Universiti, Bandar Barat, 31900 Kampar, Perak
Phone: 05-468-8888 Fax: 05-466-7407
<https://fbf.utar.edu.my/>

18th August 2021

To Whom It May Concern

Dear Sir/Madam,

Permission to Conduct Survey

This is to confirm that the following students are currently pursuing their Bachelor of Business Administration (Honours) program at the Faculty of Business and Finance, Universiti Tunku Abdul Rahman (UTAR) Perak Campus.

I would be most grateful if you could assist them by allowing them to conduct their research at your institution. All information collected will be kept confidential and used only for academic purposes.

The students are as follows:

<u>Name of Student</u>	<u>Student ID</u>
Chang You Key	18ABB01691
Katherine Chai	18ABB02688
Choh Kah Pui	18ABB04039
Chua Sue Ann	18ABB01876
Lau Shi Wei	19ABB05001

If you need further verification, please do not hesitate to contact me.

Thank you.

Yours sincerely,

Dr Tee Chee Wee
Supervisor and Head of Department
Faculty of Business and Finance
Email: teecw@utar.edu.my

Administrative Address: Jalan Sg. Long, Bandar Sg. Long, Cheras, 43000 Kajang, Selangor D.E.
Tel: (603) 9086 0288 Fax: (603) 9019 8868 Homepage: <https://utar.edu.my/>

Appendix 2: Questionnaire



UNIVERSITI TUNKU ABDUL RAHMAN

FACULTY OF BUSINESS AND FINANCE (FBF)

BACHELOR OF BUSINESS ADMINISTRATION (HONS)

Are you Satisfied with Virtual Learning during Covid-19?

A Study on Private Higher Education Institution in Malaysia.

Dear respondents:

We are students of Bachelor of Business Administration (Hons) from University Tunku Abdul Rahman (UTAR). We are currently doing our Final Year Project with the title “Are you Satisfied with Virtual Learning during COVID-19? A Study on Private Higher Education Institution in Malaysia”. The main objective of this research is to analyze the factors affecting student satisfaction with virtual learning in higher education institution in Malaysia during COVID-19.

This questionnaire comprises of THREE (3) sections. Section A is about your personal particulars, Section B is the general information of student satisfaction and Section C is about to your perception or opinion on the factors that influence student satisfaction based on the statements and scales given.

All of the information provided will be treated as CONFIDENTIAL and SAFEGUARDED in accordance with the Personal Data Protection Act 2010(“PDPA”). Your response will be used solely for academic purposes and will not be identified in

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

any data or reports. The questionnaires should not take more than a few minutes to complete. We appreciate your participation and cooperation to answer the questions.

Please feel free to contact any one of the researchers for inquiries.

Name	Student ID	E-mail Address
Chang You Key	1801691	youkey11@lutar.my
Choh Kah Pui	1804039	chohkahpui1202@lutar.my
Chua Sue Ann	1801876	sue92510@lutar.my
Katherine Chai	1802688	katherinec10@lutar.my
Lau Shi Wei	1905001	ailylau@lutar.my

Regards

Chang You Key

18ABB01691

PERSONAL DATA PROTECTION STATEMENT

Please be informed that in accordance with Personal Data Protection Act 2010 (“PDPA”) which came into force on 15 November 2013, Universiti Tunku Abdul Rahman (“UTAR”) is hereby bound to make notice and require consent in relation to collection, recording, storage, usage and retention of personal information.

Notice:

1. The purposes for which your personal data may be used are inclusive but not limited to:-
 - For assessment of any application to UTAR
 - For processing any benefits and services
 - For communication purposes
 - For advertorial and news
 - For general administration and record purposes
 - For enhancing the value of education
 - For educational and related purposes consequential to UTAR
 - For the purpose of our corporate governance
 - For consideration as a guarantor for UTAR staff/ student applying for his/her scholarship/ study loan
2. Your personal data may be transferred and/or disclosed to third party and/or UTAR collaborative partners including but not limited to the respective and appointed outsourcing agents for purpose of fulfilling our obligations to you in respect of the purposes and all such other purposes that are related to the purposes and also in providing integrated services, maintaining and storing

records. Your data may be shared when required by laws and when disclosure is necessary to comply with applicable laws.

3. Any personal information retained by UTAR shall be destroyed and/or deleted in accordance with our retention policy applicable for us in the event such information is no longer required.
4. UTAR is committed in ensuring the confidentiality, protection, security and accuracy of your personal information made available to us and it has been our ongoing strict policy to ensure that your personal information is accurate, complete, not misleading and updated. UTAR would also ensure that your personal data shall not be used for political and commercial purposes.

Consent:

1. By submitting this form you hereby authorise and consent to us processing (including disclosing) your personal data and any updates of your information, for the purposes and/or for any other purposes related to the purpose.
2. If you do not consent or subsequently withdraw your consent to the processing and disclosure of your personal data, UTAR will not be able to fulfill our obligations or to contact you or to assist you in respect of the purposes and/or for any other purposes related to the purpose.
3. You may access and update your personal data by writing to us at stated email.

Section A: Demographic Profile

Acknowledgment of Notice

I have been notified by you and that I hereby understood, consented and agreed per UTAR above notice

Email Address

1. Are you a Private Higher Education Institutions student

If you are not a Private Higher Education Institutions student, you may choose NO

Yes

No

2. Student ID

3. Gender

Male

Female

4. Age

18 years old to 21 years old

22 years old to 25 years old

Above 25 years old

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

5. Year of study

- Year 1
- Year 2
- Year 3
- Above Year 3

6. Current location of the Private Higher Education Institution

- Johor
- Kedah
- Kelantan
- Malacca
- Negeri Sembilan
- Pahang
- Perak
- Perlis
- Terengganu
- Selangor
- Sabah
- Sarawak
- Penang
- Kuala Lumpur
- Labuan

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

[] Putrajaya

Section B: Student Satisfaction

Based on your experience of virtual learning, please choose the most appropriate option that best indicate your agreement level about the following statements.

Level of agreement:

1 – Strongly Disagree

2 – Disagree

3 – Neutral

4 – Agree

5 – Strongly Agree

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I think virtual learning is a beneficial learning approach.	1	2	3	4	5
2.	Virtual learning has become a positive experience for me.	1	2	3	4	5
3.	When I am adopting an online platform in the virtual process, it fulfilled my expectations.	1	2	3	4	5
4.	When applying to an online learning platform, it has impacted my learning approach.	1	2	3	4	5

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

5.	I am satisfied with the time needed to accomplish my tasks when adopting the online platform.	1	2	3	4	5
6.	I am satisfied when performing my tasks effortlessly by adopting online learning platforms.	1	2	3	4	5

Section C: Factors that Affecting the Student Satisfaction

Based on your experience of virtual learning, please choose the most appropriate option that best indicate your agreement level about the following statements.

Level of agreement:

1 – Strongly Disagree

2 – Disagree

3 – Neutral

4 – Agree

5 – Strongly Agree

Part 1: Service Quality

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I feel every online tutorial complaint is promptly addressed.	1	2	3	4	5

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

2.	I am satisfied with the solutions of the problems provided by instructor during the online learning process.	1	2	3	4	5
3.	Instructor often deal with me in a caring and courteous manner.	1	2	3	4	5
4.	I feel that the instructor is always friendly in managing online tutorial classes.	1	2	3	4	5
5.	I feel that the instructor has good competence.	1	2	3	4	5

Part 2: Perceived Ease of Use

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I feel online learning platforms are simple to access.	1	2	3	4	5
2.	I think it is comprehensible by using online learning platforms.	1	2	3	4	5
3.	When I am utilizing online learning platforms, I feel it is user-friendly.	1	2	3	4	5
4.	It is simple for me to master the way to use online learning platforms.	1	2	3	4	5

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

5.	I need less mental exertion to engage with online learning platforms.	1	2	3	4	5
----	---	---	---	---	---	---

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Part 3: Perceived Usefulness

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I use the virtual learning platform in my study to enable me to complete my tasks more quickly.	1	2	3	4	5
2.	By using the virtual learning platform can help me to improve my study performance.	1	2	3	4	5
3.	I use the virtual learning platform to make it easier to do my study.	1	2	3	4	5
4.	By using the virtual learning platform in my study has improved my efficiency.	1	2	3	4	5
5.	By using the virtual learning platform has improved my knowledge and study skills.	1	2	3	4	5

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Part 4: Information Quality

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	I feel the information provided by virtual learning is in a useful format (e.g., computer-based/webbased/game-based/AR/VR/videos/webinars).	1	2	3	4	5
2.	I feel the information provided by virtual learning is easy to understand.	1	2	3	4	5
3.	I feel the information provided by virtual learning is accurate and up to date.	1	2	3	4	5
4.	The information provides me with sufficient content.	1	2	3	4	5
5.	The information provides me with useful content.	1	2	3	4	5
6.	I feel the information provided is related to my course.	1	2	3	4	5

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Part 5: Student and Instructor Interaction

No.	Questions	Strongly Disagree	Disagree	Neutral	Agree	Strongly Agree
1.	The instructor did communicate adequately.	1	2	3	4	5
2.	The instructor did concern about my learning.	1	2	3	4	5
3.	I was able to communicate with the instructor outside of the virtual classes.	1	2	3	4	5
4.	The instructor replied to my queries in a timely manner.	1	2	3	4	5
5.	The instructor provided some exercises for me to discuss during virtual classes.	1	2	3	4	5

Appendix 3: Reliability Test for Pilot Study

Dependent Variable: Student Satisfaction

Reliability

[DataSet1] C:\Users\TEMP.KHPP2\Documents\2 fyp.sav

Scale: Student Satisfaction

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.892	.893	6

Item Statistics

	Mean	Std. Deviation	N
I think virtual learning is a beneficial learning approach.	3.0333	1.06620	30
Virtual learning has become a positive experience for me.	3.1333	1.00801	30
When I am adopting an online platform in the virtual process, it fulfilled my expectations.	3.1000	1.06188	30
When applying to an online learning platform, it has impacted my learning approach.	3.3000	.87691	30
I am satisfied with the time needed to accomplish my tasks when adopting the online platform.	3.2000	.92476	30
I am satisfied when performing my tasks effortlessly by adopting online learning platforms.	3.2000	.96132	30

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Service Quality

Reliability

[DataSet1] C:\Users\TEMP.KHPP2\Documents\2 fyp.sav

Scale: Service Quality

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.929	.927	5

Item Statistics

	Mean	Std. Deviation	N
I feel every online tutorial complaint is promptly addressed.	3.1333	.77608	30
I am satisfied with the solutions of the problems provided by instructor during the online learning process.	3.4000	.89443	30
Instructor often deal with me in a caring and courteous manner.	3.3667	.88992	30
I feel that the instructor is always friendly in managing online tutorial classes.	3.3000	.83666	30
I feel that the instructor has good competence.	3.4000	.85501	30

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Perceived Ease of Use

Reliability

[DataSet1] C:\Users\TEMP.KHPP2\Documents\2 fyp.sav

Scale: Perceived Ease of Use

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.932	.933	5

Item Statistics

	Mean	Std. Deviation	N
I feel online learning platforms are simple to access.	3.7000	1.02217	30
I think it is comprehensible by using online learning platforms.	3.4333	1.13512	30
When I am utilizing online learning platforms, I feel it is user-friendly.	3.5667	1.07265	30
It is simple for me to master the way to use online learning platforms.	3.7000	1.11880	30
I need less mental exertion to engage with online learning platforms.	3.4667	1.16658	30

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Perceived Usefulness

Reliability

[DataSet1] C:\Users\TEMP.KHPP2\Documents\2 fyp.sav

Scale: Perceived Usefulness

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.962	.962	5

Item Statistics

	Mean	Std. Deviation	N
I use the E-Learning platform in my study to enable me to complete my tasks more quickly.	3.5667	.89763	30
By using the E-Learning platform can help me to improve my study performance.	3.4333	1.04000	30
I use the E-Learning platform to make it easier to do my study.	3.5333	1.00801	30
By using the E-learning platform in my study has improved my efficiency	3.4667	1.00801	30
By using the E-learning platform has improved my knowledge and study skills.	3.4333	1.04000	30

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Information Quality

Reliability

[DataSet1] C:\Users\TEMP.KHPP2\Documents\2 fyp.sav

Scale: Information Quality

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.970	.972	6

Item Statistics

	Mean	Std. Deviation	N
I feel the information provided by e-learning is in a useful format (e.g., computer-based/web-based/game-based/AR/VR/videos/webinars).	3.3000	1.20773	30
I feel the information provided by e-learning is easy to understand.	3.3667	1.03335	30
I feel the information provided by e-learning is accurate and up to date.	3.3667	1.18855	30
The information provides me with sufficient content.	3.3333	1.06134	30
The information provides me with useful content	3.4333	1.07265	30
I feel the information provided is related to my course.	3.4000	1.03724	30

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Student and Instructor Interaction

→ Reliability

[DataSet1] C:\Users\TEMP.KHPP2\Documents\2 fyp.sav

Scale: Student and Instructor Interaction

Case Processing Summary

		N	%
Cases	Valid	30	100.0
	Excluded ^a	0	.0
	Total	30	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.952	.954	5

Item Statistics

	Mean	Std. Deviation	N
The instructor did communicate adequately.	3.3333	.95893	30
The instructor did concern about my learning.	3.2333	.89763	30
I was able to communicate with the instructor outside of the virtual classes.	3.2000	1.03057	30
The instructor replied to my queries in a timely manner.	3.4000	.96847	30
The instructor provided some exercises for me to discuss during virtual classes.	3.4667	1.00801	30

Appendix 4: Reliability Test for Actual Study

Dependent Variable: Student Satisfaction

→ Reliability

Scale: Student Satisfaction

		N	%
Cases	Valid	400	100.0
	Excluded ^a	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.914	.914	6

	Mean	Std. Deviation	N
I think virtual learning is a beneficial learning approach.	3.8150	1.08338	400
Virtual learning has become a positive experience for me.	3.7750	1.13472	400
When I am adopting an online platform in the virtual process, it fulfilled my expectations.	3.7225	1.22033	400
When applying to an online learning platform, it has impacted my learning approach.	4.0025	.95906	400
I am satisfied with the time needed to accomplish my tasks when adopting the online platform.	3.8250	1.07343	400
I am satisfied when performing my tasks effortlessly by adopting online learning platforms.	3.8950	1.09177	400

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Service Quality

➔ **Reliability**

Scale: Service Quality

Case Processing Summary

		N	%
Cases	Valid	400	100.0
	Excluded ^a	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.813	.820	5

Item Statistics

	Mean	Std. Deviation	N
I feel every online tutorial complaint is promptly addressed.	3.6350	1.25128	400
I am satisfied with the solutions of the problems provided by instructor during the online learning process.	3.9100	1.01710	400
Instructor often deal with me in a caring and courteous manner.	3.8025	1.04701	400
I feel that the instructor is always friendly in managing online tutorial classes.	3.9500	.93792	400
I feel that the instructor has good competence.	3.9500	.97204	400

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Perceived Ease of Use

➔ **Reliability**

Scale: Perceived Ease of Use

Case Processing Summary

		N	%
Cases	Valid	400	100.0
	Excluded ^a	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.834	.840	5

Item Statistics

	Mean	Std. Deviation	N
I feel online learning platforms are simple to access.	4.2025	.85635	400
I think it is comprehensible by using online learning platforms.	4.0775	.91575	400
When I am utilizing online learning platforms, I feel it is user-friendly.	4.0400	.96474	400
It is simple for me to master the way to use online learning platforms.	4.1125	.92030	400
I need less mental exertion to engage with online learning platforms.	3.6525	1.17695	400

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Perceived Usefulness

➔ **Reliability**

Scale: Perceived Usefulness

Case Processing Summary

		N	%
Cases	Valid	400	100.0
	Excluded ^a	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.868	.871	5

Item Statistics

	Mean	Std. Deviation	N
I use the E-Learning platform in my study to enable me to complete my tasks more quickly.	4.0400	.99543	400
By using the E-Learning platform can help me to improve my study performance.	3.7275	1.24181	400
I use the E-Learning platform to make it easier to do my study.	4.0525	1.00612	400
By using the E-learning platform in my study has improved my efficiency.	4.0550	.92959	400
By using the E-learning platform has improved my knowledge and study skills.	3.8700	1.02749	400

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Information Quality

➔ **Reliability**

Scale: Information Quality

Case Processing Summary

		N	%
Cases	Valid	400	100.0
	Excluded ^a	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.831	.831	6

Item Statistics

	Mean	Std. Deviation	N
I feel the information provided by e-learning is in a useful format (e.g., computer-based/web-based/game-based/AR/VR/videos/webinars).	3.9800	1.02088	400
I feel the information provided by e-learning is easy to understand.	3.9500	.96167	400
I feel the information provided by e-learning is accurate and up to date.	3.9600	1.03735	400
The information provides me with sufficient content.	3.9775	.93765	400
The information provides me with useful content.	4.0825	.85294	400
I feel the information provided is related to my course.	4.2100	.79529	400

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Independent Variable: Student and Instructor Interaction

➔ **Reliability**

Scale: Student and Instructor Interaction

Case Processing Summary

		N	%
Cases	Valid	400	100.0
	Excluded ^a	0	.0
	Total	400	100.0

a. Listwise deletion based on all variables in the procedure.

Reliability Statistics

Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
.776	.773	5

Item Statistics

	Mean	Std. Deviation	N
The instructor did communicate adequately.	3.9500	1.01493	400
The instructor did concern about my learning.	3.7700	1.08399	400
I was able to communicate with the instructor outside of the virtual classes.	4.0500	.95119	400
The instructor replied to my queries in a timely manner.	3.6550	1.14860	400
The instructor provided some exercises for me to discuss during virtual classes.	4.0550	.86825	400

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Appendix 5: Descriptive Analysis

Demographic Profile: Private student

➔ **Frequencies**

Statistics

Are you a Private Higher Education Institution student

N	Valid	400
	Missing	0
Mean		1.0000
Median		1.0000
Mode		1.00
Std. Deviation		.00000
Variance		.000
Range		.00
Minimum		1.00
Maximum		1.00
Percentiles	25	1.0000
	50	1.0000
	75	1.0000

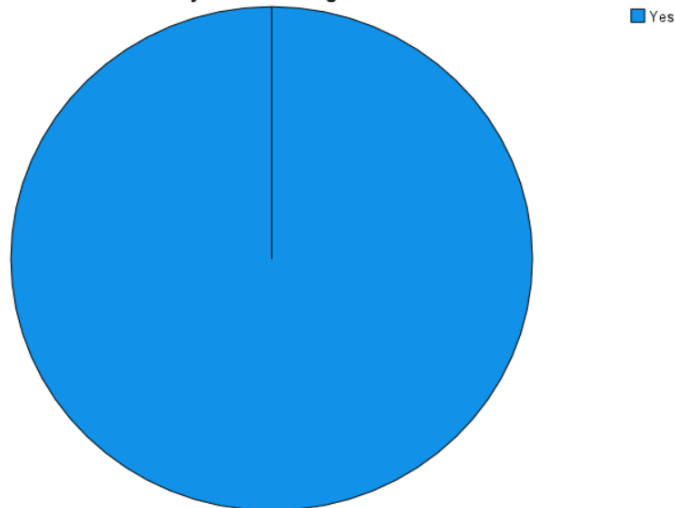
Are you a Private Higher Education Institution student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	400	100.0	100.0	100.0

Are you a Private Higher Education Institution student

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Yes	400	100.0	100.0	100.0

Are you a Private Higher Education Institution student



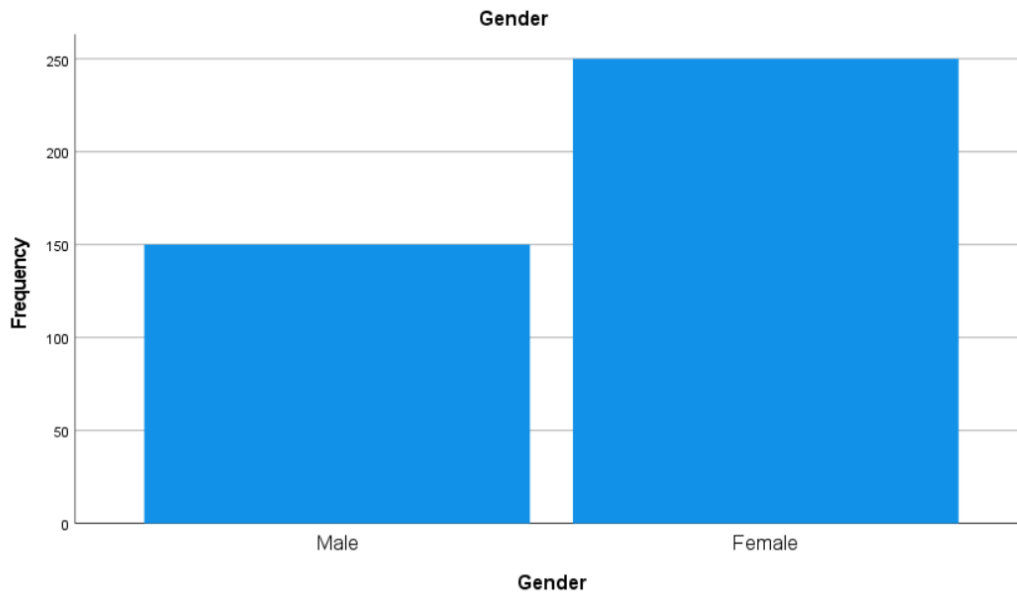
ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Demographic Profile: Gender

Frequencies

Statistics		
Gender		
N	Valid	400
	Missing	0
Mean		1.6250
Median		2.0000
Mode		2.00
Std. Deviation		.48473
Variance		.235
Range		1.00
Minimum		1.00
Maximum		2.00
Percentiles	25	1.0000
	50	2.0000
	75	2.0000

Gender					
		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Male	150	37.5	37.5	37.5
	Female	250	62.5	62.5	100.0
Total		400	100.0	100.0	



ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Demographic Profile: Age

Frequencies

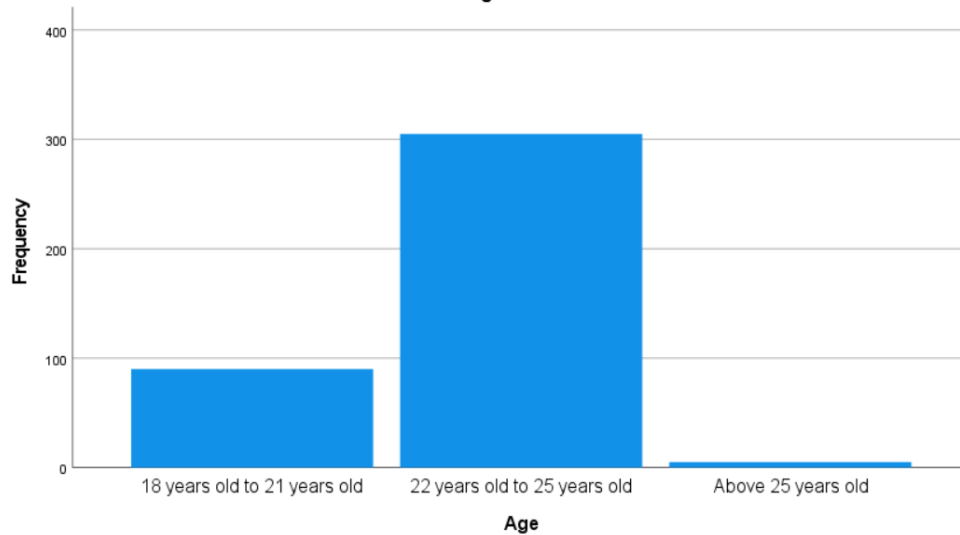
Statistics

Age		
N	Valid	400
	Missing	0
Mean		1.7875
Median		2.0000
Mode		2.00
Std. Deviation		.43912
Variance		.193
Range		2.00
Minimum		1.00
Maximum		3.00
Percentiles	25	2.0000
	50	2.0000
	75	2.0000

Age

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	18 years old to 21 years old	90	22.5	22.5	22.5
	22 years old to 25 years old	305	76.3	76.3	98.8
	Above 25 years old	5	1.3	1.3	100.0
Total		400	100.0	100.0	

Age



ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Demographic Profile: Year of Study

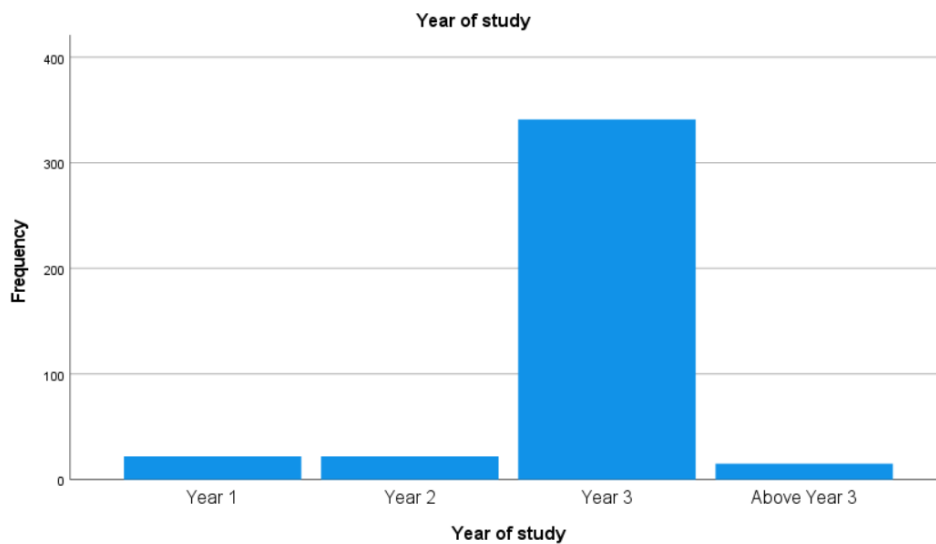
Frequencies

Statistics

Year of study		
N	Valid	400
	Missing	0
Mean		2.8725
Median		3.0000
Mode		3.00
Std. Deviation		.54496
Variance		.297
Range		3.00
Minimum		1.00
Maximum		4.00
Percentiles	25	3.0000
	50	3.0000
	75	3.0000

Year of study

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Year 1	22	5.5	5.5	5.5
	Year 2	22	5.5	5.5	11.0
	Year 3	341	85.3	85.3	96.3
	Above Year 3	15	3.8	3.8	100.0
	Total	400	100.0	100.0	



ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Demographic Profile: Current Location of the Private Higher Education Institution

➔ **Frequencies**

Statistics

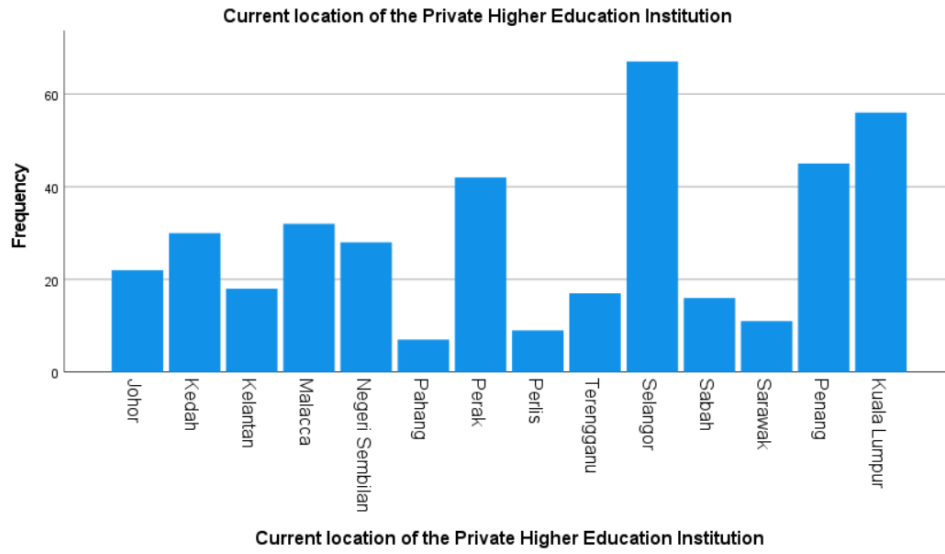
Current location of the Private Higher Education Institution

N	Valid	400
	Missing	0
Mean		8.2800
Median		9.0000
Mode		10.00
Std. Deviation		4.23514
Variance		17.936
Range		13.00
Minimum		1.00
Maximum		14.00
Percentiles	25	4.0000
	50	9.0000
	75	13.0000

Current location of the Private Higher Education Institution

		Frequency	Percent	Valid Percent	Cumulative Percent
Valid	Johor	22	5.5	5.5	5.5
	Kedah	30	7.5	7.5	13.0
	Kelantan	18	4.5	4.5	17.5
	Malacca	32	8.0	8.0	25.5
	Negeri Sembilan	28	7.0	7.0	32.5
	Pahang	7	1.8	1.8	34.3
	Perak	42	10.5	10.5	44.8
	Perlis	9	2.3	2.3	47.0
	Terengganu	17	4.3	4.3	51.2
	Selangor	67	16.8	16.8	68.0
	Sabah	16	4.0	4.0	72.0
	Sarawak	11	2.8	2.8	74.8
	Penang	45	11.3	11.3	86.0
	Kuala Lumpur	56	14.0	14.0	100.0
	Total	400	100.0	100.0	

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA



Appendix 6: Pearson Correlation Coefficient Analysis

Service Quality

Correlations

		Service Quality Average	Student Satisfaction Average
Service Quality Average	Pearson Correlation	1	.699**
	Sig. (2-tailed)		<.001
	N	400	400
Student Satisfaction Average	Pearson Correlation	.699**	1
	Sig. (2-tailed)	<.001	
	N	400	400

** . Correlation is significant at the 0.01 level (2-tailed).

Perceived Ease of Use

Correlations

		Perceived Ease of Use Average	Student Satisfaction Average
Perceived Ease of Use Average	Pearson Correlation	1	.662**
	Sig. (2-tailed)		<.001
	N	400	400
Student Satisfaction Average	Pearson Correlation	.662**	1
	Sig. (2-tailed)	<.001	
	N	400	400

** . Correlation is significant at the 0.01 level (2-tailed).

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Perceived Usefulness

Correlations

		Perceived Usefulness Average	Student Satisfaction Average
Perceived Usefulness Average	Pearson Correlation	1	.700**
	Sig. (2-tailed)		<.001
	N	400	400
Student Satisfaction Average	Pearson Correlation	.700**	1
	Sig. (2-tailed)	<.001	
	N	400	400

** . Correlation is significant at the 0.01 level (2-tailed).

Information Quality

Correlations

		Information Quality Average	Student Satisfaction Average
Information Quality Average	Pearson Correlation	1	.538**
	Sig. (2-tailed)		<.001
	N	400	400
Student Satisfaction Average	Pearson Correlation	.538**	1
	Sig. (2-tailed)	<.001	
	N	400	400

** . Correlation is significant at the 0.01 level (2-tailed).

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Student and Instructor Interaction

Correlations

		Student and Instructor Interaction Average	Student Satisfaction Average
Student and Instructor Interaction Average	Pearson Correlation	1	.636**
	Sig. (2-tailed)		<.001
	N	400	400
Student Satisfaction Average	Pearson Correlation	.636**	1
	Sig. (2-tailed)	<.001	
	N	400	400

** . Correlation is significant at the 0.01 level (2-tailed).

Appendix 7: Multiple Linear Regression Analysis

➔ Regression

Variables Entered/Removed^a

Model	Variables Entered	Variables Removed	Method
1	Student and Instructor Interaction Average, Information Quality Average, Perceived Ease of Use Average, Perceived Usefulness Average, Service Quality Average ^b	.	Enter

a. Dependent Variable: Student Satisfaction Average

b. All requested variables entered.

Model Summary

Model	R	R Square	Adjusted R Square	Std. Error of the Estimate
1	.788 ^a	.621	.616	.56832

a. Predictors: (Constant), Student and Instructor Interaction Average, Information Quality Average, Perceived Ease of Use Average, Perceived Usefulness Average, Service Quality Average

ANOVA^a

Model		Sum of Squares	df	Mean Square	F	Sig.
1	Regression	208.174	5	41.635	128.905	<.001 ^b
	Residual	127.257	394	.323		
	Total	335.431	399			

a. Dependent Variable: Student Satisfaction Average

b. Predictors: (Constant), Student and Instructor Interaction Average, Information Quality Average, Perceived Ease of Use Average, Perceived Usefulness Average, Service Quality Average

ARE YOU SATISFIED WITH VIRTUAL LEARNING DURING COVID-19? A STUDY
ON PRIVATE HIGHER EDUCATION INSTITUTIONS IN MALAYSIA

Coefficients^a

Model		Unstandardized Coefficients		Standardized Coefficients	t	Sig.
		B	Std. Error	Beta		
1	(Constant)	-.419	.187		-2.234	.026
	Service Quality Average	.313	.057	.271	5.477	<.001
	Perceived Ease of Use Average	.262	.056	.216	4.715	<.001
	Perceived Usefulness Average	.287	.053	.265	5.422	<.001
	Information Quality Average	.092	.054	.069	1.708	.089
	Student and Instructor Interaction Average	.127	.059	.103	2.154	.032

a. Dependent Variable: Student Satisfaction Average