

**A STUDY ON FACTORS INFLUENCING THE ONLINE
LEARNING OF THE UNDERGRADUATES
(WITH SPECIAL REFERENCE TO UNDERGRADUATES
OF THE FACULTY OF HUMANITIES AND SOCIAL
SCIENCES, UNIVERSITY OF SRI
JAYEWARDENEPURA.)**

Uda Maushika Weerasena

(178140G)

Degree of Master of Science

Department of Mathematics

University of Moratuwa

Sri Lanka

March 2023

**A STUDY ON FACTORS INFLUENCING THE ONLINE
LEARNING OF THE UNDERGRADUATES
(WITH SPECIAL REFERENCE TO UNDERGRADUATES
OF THE FACULTY OF HUMANITIES AND SOCIAL
SCIENCES, UNIVERSITY OF SRI
JAYEWARDENEPURA.)**

Uda Maushika Weerasena

(178140G)

**Dissertation submitted in fulfillment of the requirements for the
degree Master of Science in Operational Research**

Department of Mathematics

University of Moratuwa

Sri Lanka

March 2023

DECLARATION OF THE CANDIDATE

I declare that this is my own work and this dissertation does not incorporate without acknowledgment any material previously submitted for a Degree or Diploma in any other University or institute of higher learning and to the best of my knowledge and belief, it does not contain any material previously published or written by another person except where the acknowledgment is made in the text.

Also, I hereby grant to the University of Moratuwa the non-exclusive right to reproduce and distribute my dissertation, in whole or in part in print, electronic or other mediums. I retain the right to use this content in whole or part in future works.

Signature of Candidate:

Date: 26 July 2023

Uda Maushika Weerasena

DECLARATION OF THE SUPERVISOR

The above candidate has carried out research for the Master's Dissertation under my supervision.

Signature:

Date:

Senior Lecturer Mr. Rohana Dissanayake

ABSTRACT

The revival in interest in distance education can be seen in the past two decades. This was caused due to many reasons and was made possible through the application of new computer and communication systems. Even the people who believed that the mix of technology in the classroom can help to teach and to learn, do not believe strategy to use is not easy. In the 21st century, with the influx of the Digital era, the mode of instruction delivery in the field of education is being moved from teacher-centered education to student-centered education and that can be marked as a significant development in the field of education. The main objective of this study is to identify the factors affecting the online learning of undergraduates of the Faculty of Humanities and Social Sciences of the University of Sri Jayewardenepura. The researcher selected the stratified simple random sampling method to collect data from the undergraduates of the Faculty of Humanities and Social Science of the USJ, across the four study years. Based on the register number of the undergraduates of the FHSS, the sample of 400 sampling units were considered for the analysis. An exploratory factor analysis was performed on the data to identify the factors and the factors derived are: Instructor support, Workload and time, Technical assistance, Learner characteristics, and Course content and e-learning material. As per the analysis, Instructor support is the most significant factor among the five factors, therefore, more attention should be focused on the instructors as many undergraduates depend on the instructor's assistance in online learning. The One-Way ANOVA test was conducted to identify whether there is a significant difference in the identified variables with regard to gender, study year, degree type and primary internet connection, and age levels. The findings concludes that there is no difference in all four factors; Instructor assistance, Workload and time, Technical assistance, Learner characteristics, Course content, and e-learning material, with regard to the gender levels, study year, degree type and primary internet connection type. Yet, it is observed that there is a statistical difference in the two factors: Instructor assistance, Preference, workload and time with regard to age categories.

Keywords: Education, Factor analysis, Instructor's assistance, Online learning.

ACKNOWLEDGMENT

I would like to sincerely express my deep gratitude to all the individuals who extended their fullest support to complete my research.

Firstly, my sincere gratitude to my supervisor, Senior Lecturer Mr. A.R Dissanayake, the Head of the Department of Mathematics, Faculty of Engineering, University of Moratuwa, for his constant guidance and encouragement given to complete the research.

Additionally, I appreciate the valuable support given by Dr. Pasan Edirisinghe and all other lecturers and the non-academic staff of the Department of Mathematics.

Also, I would like to convey special thanks to both the academic and the non-academic staff of the FHSS of the USJ who supported me in data collection from respondents and by providing valuable information. Moreover, my deepest thanks go to the respondents of the study.

I am also grateful to my parents and my colleagues for their understanding, and constant support given to achieve my task successfully.

TABLE OF CONTENTS

DECLARATION OF THE CANDIDATE	ii
DECLARATION OF THE SUPERVISOR.....	ii
ABSTRACT	iii
ACKNOWLEDGMENT.....	iv
TABLE OF CONTENTS.....	v
LIST OF FIGURES	x
LIST OF TABLES	xi
LIST OF ABBREVIATIONS.....	xii
LIST OF APPENDICES.....	xiii
1. INTRODUCTION	1
1.1 Introduction	1
1.2 Background to the research	1
1.3 Online learning	3
1.4 Online learning during the COVID-19 pandemic	4
1.5 Problem statement	5
1.6 Research questions	7
1.7 Research objectives	7
1.8 Scope of the research.....	8
1.9 Significance of the study	8
1.10 Limitations.....	8
1.11 Thesis chapter structure.....	8
2. LITERATURE REVIEW	10
2.1 Chapter introduction	10
2.2 Evolution of online learning	10
2.3 Online Learning or E-learning.....	12
2.4 Online learning; a necessity	13

2.5 Advantages and disadvantages of online learning	13
2.6 Online learning in the higher education.....	14
2.7 Online learning amidst the COVID-19	15
2.8 COVID-19 pandemic, online learning and Sri Lankan higher education sector	16
2.9 Factors affecting online learning.	16
2.9.1 Attitude of the students.....	16
2.9.2 Instructor Attitudes.....	17
2.9.3 Computer Literacy.....	17
2.9.4 Teaching Method.....	18
2.9.5 Content Quality	18
2.9.6 System Quality	19
2.9.7 Technology	19
2.9.8 Administrative Support	20
2.9.9 Workload and Time.....	20
2.10 Previous related findings	20
2.11 Chapter summary	23
3. METHODOLOGY	24
3.1 Introduction	24
3.2 Research Design	24
3.3 Quantitative Approach	24
3.4 Design of the Questionnaire	25
3.5 Sampling Procedure	25
3.5.1 Population of the study.....	25
3.5.2 Sampling Technique.....	26
3.5.3 Sample Size	26
3.6 Data Sources.....	27

3.6.1 Secondary Data Collection	27
3.6.2 Primary Data Collection	27
3.7 Variables of the study	28
3.8 Methods of Data Analysis	28
3.8.1 Exploratory Data Analysis (EDA)	28
3.8.2 Validity and Reliability	29
3.8.3 Descriptive Analysis.....	30
3.8.4 One-Way ANOVA Test	31
3.8.5 Converting of Likert scaled items to a continuous variable	33
3.8.6 Factor Analysis.....	33
3.8.6.1 Requirements for Factor Analysis	34
3.8.6.2 Extraction of Factors	36
3.8.6.3 Identification of Factors	36
3.8.6.4 Rotating factors	37
3.8.6.5 Varimax rotation.....	37
3.8.6.6 Correlation matrix	37
3.8.6.7 Communality	38
3.8.6.8 Factor Score Coefficients	38
3.9 Summary	39
4. DATA PRESENTATION AND ANALYSIS	40
4.1 Introduction	40
4.2. Descriptive Analysis.....	40
4.2.1 Gender distribution of the respondents	40
4.2.2 Age of the respondents	41
4.2.3 Year of study of respondents.....	41
4.2.4 Distribution of district of respondents.....	42
4.2.5 Degree type of the respondents	42

4.2.6 Device used for online learning.....	43
4.2.7 Primary internet connection of the respondents	43
4.2.8 Quality of the network connection	44
4.2.9 Previously used online platforms for learning	44
4.3 Advanced Analysis.....	45
4.3.1 Reliability of the data set.....	45
4.3.2 Exploratory factor analysis.....	45
4.3.2.1 Requirements for factor analysis.....	45
4.3.2.2 Proceedings for Exploratory Factor Analysis	46
4.3.2.3 Factors identification.....	50
4.3.2.4 Rotation of Factor.....	51
4.3.2.5 Details of the five factors	55
4.3.2.6 Naming the factors.	56
4.3.2.7 The priority of factors affecting online learning	57
4.3.3 One – Way ANOVA test.....	58
4.4 Summary	60
5. DISCUSSION, CONCLUSION AND RECOMMENDATIONS.....	61
5.1 Introduction	61
5.2 Discussion	61
5.3 Conclusion.....	65
5.4 Recommendations derived through the study	66
REFERENCES	67
APPENDICES	75
Appendix A: Sample Questionnaire	75
Appendix B: Variables and attributes of the study.....	81
Appendix C: SPSS Data Output for Reliability	83
Appendix D: SPSS Data Output for Validity	84

Appendix E: Matrix table of Correlation	85
Appendix F: SPSS Data Output for Scree Plot	86
Appendix F: SPSS Data Output for Total Variance Explained	87
Appendix G: SPSS Data Output for Rotated Component Matrix	88
Appendix H: SPSS Data Output for Component Score Coefficient Matrix.....	89
Appendix I: SPSS Data Output for One way ANOVA Test - Gender.....	90
Appendix J: SPSS Data Output for One way ANOVA Test - Study Year	90
Appendix K: SPSS Data Output for One way ANOVA Test - Age.....	91
Appendix L: SPSS Data Output for One way ANOVA Test - Degree Type.....	91
Appendix M: SPSS Data Output for One way ANOVA Test - Primary Internet Connection	92

LIST OF FIGURES

Figure 3.1	Research Design	24
Figure 4.1	Gender distribution of the respondents.....	40
Figure 4.2	Age of the respondents	41
Figure 4.3	Year of study of respondents	41
Figure 4.4	Distribution of district of respondents	42
Figure 4.5	Degree type of the respondents	42
Figure 4.6	Device used for online learning.....	43
Figure 4.7	Primary internet connection	43
Figure 4.8	Quality of the network connection	44
Figure 4.9	Previously used online platforms for learning.....	44
Figure 4.10	Scree plot	48

LIST OF TABLES

Table 3.1: Distribution of undergraduates of the Faculty of Humanities and Social Sciences of University of Sri Jayewardenepura (Year wise)	26
Table 3.2: Distribution of the sample	26
Table 3.3: Rating of the Five-point Likert Scale	27
Table 3.4: Variables and attributes of the study	81
Table 3.5: Rule of thumb for Kaiser-Meyer Olkin Measure of Sampling Adequacy	29
Table 3.6: Rule of thumb for Cronbach's Alpha for reliability testing	30
Table 4.1: Age of the respondents (In years).....	41
Table 4.2: Reliability Analysis for Data Set	45
Table 4.3: Kaiser-Meyer-Olkin (KMO) Measure of Sampling Adequacy	46
Table 4.4: Bartlett's test of Sphericity	46
Table 4.5: Initial and extracted communalities of the five factor model under the Principal Component Analysis extraction	49
Table 4.6: Eigen value analysis for the twenty-four variables.....	51
Table 4.7: Rotated Component Matrix for the data set.....	52
Table 4.8: Factor Score Coefficient Matrix	55
Table 4.9: Priority of factors to online learning.....	57
Table 4.10: ANOVA tests for independent variables	58

LIST OF ABBREVIATIONS

Abbreviation	Description
COVID -19	Corona Virus Disease 2019
EDA	Exploratory Data Analysis
FHSS	Faculty of Humanities and Social Sciences
ICT	Information Communication Technology
KMO	Kaiser-Mayer Olkin
LMS	Learning Management System
SPSS	Statistical Package for Social Sciences
USJ	University of Sri Jayewardenepura
WHO	World Health Organization

LIST OF APPENDICES

Appendix	Description	
Appendix A	Sample Questionnaire	75
Appendix B	Variables and attributes of the study	81
Appendix C	SPSS Data Output for Reliability	83
Appendix D	SPSS Data Output for Validity.....	84
Appendix E	Matrix table of Correlation	85
Appendix F	SPSS Data Output for Scree Plot.....	86
Appendix F	SPSS Data Output for Total Variance Explained	87
Appendix G	SPSS Data Output for Rotated Component Matrix.....	88
Appendix H	SPSS Data Output for Component Score Coefficient Matrix.....	89
Appendix I	SPSS Data Output for One way ANOVA Test - Gender	90
Appendix J	SPSS Data Output for One way ANOVA Test - Study Year.....	90
Appendix K	SPSS Data Output for One way ANOVA Test - Age	91
Appendix L	SPSS Data Output for One way ANOVA Test - Degree Type	91
Appendix M	SPSS Data Output for One way ANOVA Test - Primary Internet Connection	92