

**PERCEIVED LEARNING AND SATISFACTION WITH ONLINE LEARNING
AMONG MANAGEMENT STUDENTS DURING COVID-19 PANDEMIC**

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RECOMMENDATION

CERTIFICATION

DECLARATION OF AUTHENTICITY

I, Sujan Tamang, certify that this GRP is solely my original work and that no one has prepared it for me. I have not copied other individuals' work, and I have fully cited and specifically documented all the works that I used to complete this work of Thesis. I am aware of plagiarism and its consequences. Further, I am aware of SOMTU's policy that if there is any evidence of misrepresentation and misconduct concerning any aspect of my work, SOMTU can revoke any credits awarded to me based on this material.

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TABLE OF CONTENTS

<i>Recommendation</i>	ii
<i>Certification</i>	iii
<i>Declaration of Authenticity</i>	iv
<i>Acknowledgments</i>	v
<i>Table of Contents</i>	vi
<i>List of Tables</i>	ix
<i>List of Figures</i>	xi
<i>Abbreviations</i>	xii
<i>Executive Summary</i>	xiii
CHAPTER I INTRODUCTION	1
1.1 Background of Study	1
1.2 Statement of Problem	2
1.3 Objectives	3
1.4 Research Hypotheses	3
1.5 Scope and Significance of the Study	6
1.6 Limitations of the Study	6
1.7 Structure of the Report	7
CHAPTER II LITERATURE REVIEW AND THEORETICAL FRAMEWORK	8
2.1 Theoretical Review	8
2.1.1 Overview of Online Learning	8
2.1.2 Background Theories	9
2.1.3 Determinants of Online Learning Satisfaction	12
2.2 Empirical Review	16
2.3 Research Gap	24
2.4 Conceptual Framework	24

CHAPTER III RESEARCH METHODOLOGY.....	26
3.1 Research Design.....	26
3.2 Population and Sample Size.....	26
3.3 Data Collection Method.....	27
3.4 Instrumentation.....	27
3.5 Reliability Analysis.....	28
3.6 Data Analysis Method.....	28
3.7 Ethical Considerations.....	29
CHAPTER IV ANALYSIS AND RESULTS.....	30
4.1 Demographic Profile of Respondents.....	30
4.2 Descriptive Statistics of Independent Variables, Mediating Variables, and Dependent Variables.....	33
4.3 Normality Test.....	39
4.3.1 Shapiro-Wilk test.....	39
4.4 Measurement Model.....	43
4.4.1 Model Validation Result (Composite Reliability and Validity).....	44
4.4.2 Discriminant Validity.....	45
4.4.3 Collinearity Test.....	48
4.5 Model Fit.....	50
4.6 Correlation Matrix.....	50
4.6.1 Correlation between independent variables and Perceived Learning.....	51
4.6.2 Correlation between independent variables and Online Learning Satisfaction ..	51
4.6.3 Correlation between Perceived Learning and Online Learning Satisfaction	51
4.7 Structural Equation Model Analysis.....	52
4.8 Mediation Effect.....	54
4.8.1 Mediation effect of PL on the relation between LI and OLS.....	54

4.8.2 Mediation effect of PL on the relation between PI and OLS	55
4.8.3 Mediation effect of PL on the relation between CD and OLS	55
4.8.4 Mediation effect of PL on the relation between TS and OLS	56
4.8.5 Mediation effect of PL on the relation between FS and OLS	56
4.9 Hypothesis Testing Summary	57
4.10 Major Findings	58
CHAPTER V DISCUSSION, CONCLUSION, AND IMPLICATION	62
5.1 Discussion	62
5.2 Conclusion.....	66
5.3 Implications	67
5.3.1 Managerial Implication	67
5.3.2 Implication of Researcher	68
REFERENCE	69
APPENDIX	84

LIST OF TABLES

Table 2.1 Summary of Articles Reviewed	20
Table 3.1 Cronbach's alpha of Constructs	28
Table 4.1 Respondents' Demographic Profile	30
Table 4.2 Respondent profile of Devices used for Online Class	31
Table 4.3 Internet Connection at Home	32
Table 4.4 VC Platform used for Online Classes	32
Table 4.5 Position of Learner-Interface Interaction	33
Table 4.6 Position of Peer Interaction	34
Table 4.7 Teacher-Student Interaction	35
Table 4.8 Position of Course Design.....	36
Table 4.9 Position of Faculty/University Support.....	37
Table 4.10 Position of Perceived Learning	38
Table 4.11 Online Learning Satisfaction Scores	39
Table 4.12 Shapiro-Wilk Test	39
Table 4.13 Model Validation Result (Composite Reliability and Validity).....	44
Table 4.14 Fornell-Larcker Test.....	45
Table 4.15 Cross Loading	46
Table 4.16 Heterotrait-Monotrait Ratio (HTMT)	48
Table 4.17 Collinearity Test Statistics	49
Table 4.18 SRMR Statistics	50
Table 4.19 Correlation Matrix.....	50
Table 4.20 Path Coefficient.....	53
Table 4.21 Mediation Analysis of PL on the relation between LI and OLS	54
Table 4.22 Total Effect, Direct Effect, and Indirect Effect of PI on OLS	55
Table 4.23 Mediation Analysis of PL on the relation between CD and OLS	55

Table 4.24 Mediation Analysis of PL on the relation between TS and OLS	56
Table 4.25 Mediation Analysis of PL on the relation between FS and OLS	56
Table 4.26 Result of Hypothesis Testing	57

LIST OF FIGURES

Figure 2.1 Conceptual Framework.....	25
Figure 4.1 Histogram of Learner interface.....	40
Figure 4.2 Histogram of Peer Interaction.....	40
Figure 4.3 Teacher-Student Interaction.....	41
Figure 4.4 Histogram of Course Design.....	41
Figure 4.5 Histogram of University/Faculty Support.....	42
Figure 4.6 Histogram of Perceived Learning.....	42
Figure 4.7 Histogram of Online Learning Satisfaction.....	43

ABBREVIATIONS

AVE	Average Variance Extracted
CD	Course Design
CR	Composite Reliability
CSF	Critical Success Factors
FS	Faculty Support
HTMT	Heterotrait-Monotrait Ratio
LI	Learner-Interface Interaction
LMS	Learning Management System
OLS	Online Learning Satisfaction
PI	Peer Interaction
PL	Perceived Learning
SD	Standard Deviation
SEM	Structure Equation Modeling
SPSS	Statistical Package for Social Sciences
SRMR	Standardized Root Mean Square Residual
TS	Teacher-Student Interaction
VC	Video Conferencing
VIF	Variance Inflation Factor

EXECUTIVE SUMMARY

The COVID-19 pandemic emergency disrupted normal life functioning across the globe. One major change involved universities that had to transform the traditional FTF classes into online courses as a new normal. As a result of the sudden shift towards online learning due to COVID-19, many studies have been conducted focusing on perceived learning and student satisfaction in this new environment. This research aims to look at the elements that influence students' perceptions of learning and their impact on learning satisfaction in online classrooms during the pandemic. This study also investigates the mediating role of perceived learning in the relation between these determinants and student satisfaction.

The research adopted a self-administered questionnaire survey consisting seven-point Likert scale. A total of 384 university students completed the survey. The sample was taken from different university students from rural and urban areas. Descriptive statistics, as well as structural equation modeling, were used to analyze the data collected. IBM SPSS 25 was used for the descriptive and correlational analysis. SmartPLS 3 was used for validation of data and test for mediation effect.

The findings suggest that all three types of interactions i.e. learner-interface interaction, peer interaction, and teacher-student interaction are significant predictors of perceived learning. Course design had a significant positive impact on perceived learning whereas faculty support had no significant effect on students' perceived learning. Among three types of interaction, learner-interface interaction and teacher-student interaction had significant positive impacts on students' satisfaction during online learning. Both course design and faculty support determined students' learning satisfaction. Likewise, perceived learning partially mediated the relation of learner-interface interaction, teacher-student interaction, and course design with learning satisfaction. Whereas, the relation between peer interaction and online learning satisfaction was fully mediated by perceived learning.

It can be concluded that professors and academicians should pay special attention to learner-interface interaction and teacher-student interaction to enhance the effectiveness of online learning. Adequate instruction, consistent faculty support, quality course structure, and user-friendly interface design can facilitate perceived learning and student satisfaction with online learning during the COVID-19 Pandemic. Thus Academicians should consider the above factors while designing and implementing online learning courses.

CHAPTER I

INTRODUCTION

1.1 Background of Study

The ongoing COVID-19 pandemic is not only causing a considerable impact on public health but also on learning. It has affected over 216 countries and territories around the world and caused economic shutdown since the great depression (WHO 2020). The first COVID-19 case was found on 23rd January 2020 in Nepal. In March 2020 Government of Nepal laid strict lockdown as a counter-measure against corona. Businesses, educational centers, community centers, and many other marketplaces have been required to shut down. There was a restriction on mass gatherings and lockdown measures were imposed in many countries, allowing movement for critical needs only (Brodeur, Islam, Gray, & Bhuiyan, 2020). The restrictive measures, directly and indirectly, affected the education of 80% of students worldwide (Lancker & Parolin, 2020). The COVID-19 outbreak enforced many schools, campuses, and universities to shut down physical classes and remain closed for a temporary manner (Dhawan, 2020). Within weeks, most schools and colleges in Nepal officially closed and switched their classroom courses to fully-online environments.

Online learning is not an entirely new approach to education delivery. Higher education has been offering classes by incorporating online learning for years (Kentnor, 2015). Online learning bridges two critical areas: learning and technology. In the previous two decades, there has been an upsurge in the study of e-learning terminology and methods of learning. E-learning encompasses a wide range of techniques and behaviors (Clarke, 2007).

The first university to provide completely online Master's and Bachelor's degree programs is the University of Phoenix in 1989 (Andrew, 1993). In Nepal, college education began with an adult education radio program in 1958. It is widely regarded as Nepal's first step into distant education. There were 84 open school centers located around the country, covering all 75 districts (Khanal, 2014). Traditional learning approaches are no longer enough to fulfill the demands of an increased learning process, particularly in higher education (Wang et al., 2019). Tribhuvan University (TU), Nepal's eldest and biggest university (Koirala, Silwal, Gurung, Bhattarai, & KC, 2020), also formally adopted the online class model with proper instructions and guidelines and distributed the updates to its constituent campuses on April 24, 2020. (Tribhuvan University, 2020). As a response to the shutdown of face-to-face

learning, Tribhuvan University began offering online lessons using Microsoft Teams, which accounts for 82% of higher education in the country (Acharya, et al., 2020).

Transforming learning is a difficult task that usually requires instructors to reassess what constitutes "instruction" and "learning" (Kirkwood, 2014). The swift execution of new online learning methods provided a different and novel experience for both academicians and the students both (Nepal, Atreya, Menezes, & Joshi, 2020). There was little time to prepare academics and students for the implementation of online teaching-learning processes or the development of appropriate practices and standard working procedures (Agarwal & Dewan, 2020). In this situation, it is critical to comprehend students' perceptions and reactions to the practice of Online-Classes, as well as how to implement these methods and approaches effectively to improve Online-Class effectiveness. It is imperative to scrutinize the insights on the effectiveness of online classes to improve online teaching strategies so that teachers and students can accommodate the rapid transition between learning modes. There is, however, no research that looks at the impact of transitioning from traditional classroom learning to an online learning environment without any prior experience or training among Nepalese students. This paper aims to investigate the factors that affected the student's perceived learning and learning satisfaction in online classes due to the pandemic. The findings of the study suggest measures to create an effective online learning environment. It will not only guide policymakers to adapt suitable policies but also be helpful to educators and teachers to adopt different measures to stimulate students' learning initiatives.

1.2 Statement of Problem

Schools and Universities swiftly moved toward the online teaching-learning platform. The university professors and students are gradually adjusting to the situation (Chakraborty, Mittal, Gupta, & Yadav, 2020). The swift implementation did not give academicians, policy makers, and students enough time to research and design the best practices and procedures in online teaching-learning (Agarwal & Dewan, 2020). The pandemic has a substantial impact on kids' learning and well-being, and it is likely to exacerbate gaps in access to quality education between advantaged and impoverished children (Dawadi et al., 2020). Sharma et al. (2020) observed that learning domains such as learner dimension, technology features, instructor qualities, and course administration and organization are significantly correlated to learners' satisfaction with online learning. Online classes are not as successful as traditional classroom teachings; but, by adding interactive and brainstorming sessions to

supplement traditional face-to-face education, they can be made more participatory and productive (Nepal et al., 2020). Despite this, none of these studies provide a clear picture of students' impressions of online education's effectiveness during the COVID-19 epidemic. Therefore, this study attempts to fill the same gap

Research Questions

Research Question 1: What are the impacts of Interaction (Learner-interface interaction, Peer Interaction, and Teacher-Student Interaction) and University Effort (Course Design and Faculty Support) on Perceived Learning on online learning during the COVID-19 pandemic?

Research Question 2: What are the impacts of Interaction and University Effort on Student Satisfaction in online learning during the COVID-19 pandemic?

Research Question 3: Is there any mediating role of Perceived Learning in the relation between Interaction, University Effort, and Student Satisfaction in online learning during the COVID-19 pandemic?

1.3 Objectives

The objectives of the study are:

1. To examine the impact of Interaction (Learner-interface interaction, Peer Interaction, and Teacher-Student interaction) on Perceived Learning and Student Satisfaction in online classes during the COVID-19 pandemic.
2. To examine the effect of University Effort (Course Design and University Support) on the Perceived Learning and Student Satisfaction in online classes during the COVID-19 pandemic.
3. To analyze the mediation effect of Perceived Learning on the relationship between Interaction & University Effort on Online Learning Satisfaction during the COVID-19 pandemic.

1.4 Research Hypotheses

Numerous empirical studies have presented a significant effect of learner-interface interaction on students' perceived learning and level of satisfaction. Shee & Wang, (2008) observed that learners viewed the learner interface as one of the important dimensions that affect the success of online learning. Learner-interface interaction has been identified as an important dimension of online learning satisfaction. Several IS-related research studies have

described the learning interface as a space for the occurrence of a high-level interaction (Kumar, Smith, & Bannerjee, 2004). Therefore following hypotheses are proposed.

Hypothesis 1a: Learner-interface interaction positively influences Perceived Learning in online classes during the pandemic. [LI \rightarrow + PL]

Hypothesis 1b: Learner-interface interaction positively influences Online Learning Satisfaction during the pandemic. [LI \rightarrow + OLS]

Several empirical research has presented a significant effect of interaction on learning outcomes and students' satisfaction with online classes. Interaction is a critical success factor that bridges the gap and fosters a positive online learning experience (Leidner & Jarvenpaa, 1995; Slavin, 1990; Bruner, 1985). Tsang et al. (2021) and Eom & Ashil (2016) concluded that students' interaction with friends has a significant positive impact on their level of satisfaction and perceived learning. Thus, the next hypotheses are proposed.

Hypothesis 2a: Peer Interaction positively influences Perceived Learning in online classes during the pandemic. [PI \rightarrow + PL]

Hypothesis 2b: Peer Interaction positively influences Online Learning Satisfaction during the pandemic. [PI \rightarrow + OLS]

Several prior studies have found that an interactive teaching style and high levels of teacher-student interactions are substantially related to high levels of user satisfaction and learning results (Swan, 2001; Arbaugh, 2000). According to Alqurashi (2019), learners' interaction with content and teacher-student interactions are critical for enhancing students' learning satisfaction and perceived learning in online classes. Hence the following hypotheses are proposed.

Hypothesis 3a: Teacher-Student Interaction positively influences the Perceived Learning in online classes during the pandemic. [TS \rightarrow + PL]

Hypothesis 3b: Teacher-Student Interaction positively influences the Learning Satisfaction in online classes during the pandemic. [TS \rightarrow + OLS]

Levin & Wadmany (2006) emphasizes the significance of the study in professional practices for designing course structure and tutoring to improve students' distance learning experiences (Levin & Wadmany, 2006). Swan et al. (2012) demonstrated that course design has an impact on students' learning processes and learning outcomes. Therefore we theorize that course design is positively correlated with students' perceived learning and satisfaction.

Hypothesis 4a: Course Design positively influences Perceived Learning in online classes during the pandemic. [CD →+ PL]

Hypothesis 4b: Course Design positively influences learning satisfaction with online classes during the pandemic. [CD →+ OLS]

Mullen and Tallent-Runnels (2006) discovered both intellectual and emotional support were connected to satisfaction and perceived learning in online courses. According to several empirical studies faculty support (in the form of acceptance or involvement) is crucial to the approval and use of virtual learning, studies (Betts, 2014; Major, 2010; Bollinger & Wasilik, 2009). Hence we theorize the following hypotheses.

Hypothesis 5a: Faculty Support positively influences Perceived Learning in online classes during the pandemic. [FS →+ PL]

Hypothesis 5b: Faculty Support affects learning satisfaction positively in online classes during the pandemic. [FS →+ OLS]

Several researchers found that students' perceived learning has greater predictive power for satisfaction in online learning. Ikhsan et al. (2019) observed that perceived learning positively contributes to user satisfaction in the online environment. Similarly, Richardson and Swan (2003) found a strong correlation between students' overall perceptions of learning and their satisfaction with online learning. Tsang et al., (2021) discovered that perceived learning had a greater association with satisfaction than any other variable. Thus, the subsequent postulates are proposed.

Hypothesis 6: Perceived Learning has a positive influence on Student Satisfaction in online learning during the pandemic. [PLO →+ OLS]

Several studies show that perceived learning mediates the relation between several critical success factors (CSFs) of e-learning and learners' satisfaction in university online education. Eom & Ashill, (2016) discovered that teacher-student interaction, peer interaction, and course design have a significant effect on learning outcomes and satisfaction in students with online learning. In many research studies in online learning contexts, perceived learning has been used as a strong variable to measure student learning (Horzum, Kaymak, & Gungoren, 2015; Overbaugh & Nickel, 2011). However, only a few research in this area has explored the serial mediation effect of perceived learning in the relation between CSFs and learning satisfaction. Hence to examine the mediation role of perceived learning, we theorize the following hypotheses.

Hypothesis 7: There is significant mediation of Perceived Learning in the relation between Learner interface and Online Learning Satisfaction. [LI → PL → OLS]

Hypothesis 8: The impact of Peer Interaction on Online Learning Satisfaction is mediated by Perceived Learning. [PI → PL → OLS]

Hypothesis 9: Perceived Learning mediates the relationship between Teacher-Student Interaction and Online Learning Satisfaction. [TS → PL → OLS]

Hypothesis 11: Perceived Learning mediates the relation between Course Design and Online Learning Satisfaction. [CD → PL → OLS]

Hypothesis 12: Perceived Learning mediates the relation between Faculty/University Support and Online Learning Satisfaction. [FS → PL → OLS]

1.5 Scope and Significance of the Study

Online learning has become a vital method of education delivery since the COVID-19 pandemic. Every college and university had to shift towards online learning abruptly owing to closure and restrictions due to the pandemic. According to Kirkwood (2014), transforming learning is a difficult task that usually requires instructors to reassess their "teaching" and "learning". The study's importance stems from its endeavor to address the problem that lies in the transformation of the learning process from face-to-face learning to online classes. This study contributes to the extension of knowledge related to satisfaction of students with online learning during the COVID-19 pandemic. The study aims to contribute to identifying the perception of students toward online learning, and their expectations from the faculty, instructors, and University. This research also contributes to uncovering critical success factors that are significant to the effectiveness of online teaching-learning and help academicians to formulate standard teaching practices and procedures. In the end, this study will be helpful to the upcoming researchers who are interested in the same field.

1.6 Limitations of the Study

Every research project consists of its own set of constraints. This study is based on data from a primary source. As a result, the following are the limitations of this study paper:

- This research is limited to higher management students.
- The study considers only five variables for predicting learning satisfaction. Factors other than the included ones may be more significant predictors.

- Since the respondents are chosen from close circles of friends, generalization for the whole population of investors may not be fulfilled

1.7 Structure of the Report

This GRP report is made up of three main parts: the preparatory part, the body of the report, and the supplemental part. The title page, certification and statement of authority, table of contents, list of tables and figures, list of abbreviations used, and executive summary are all included in the preparatory part. The references and appendices are included in the supplemental section. The body part of the report includes five chapters namely, introduction, review of literature, theoretical framework, research method, data analysis and results, discussion, conclusions, and implications.

The first chapter of the body section is the introduction. This chapter includes the background of the study, statement of the problem, objectives of the study, definition of terms, research hypothesis, scope, and significance, limitations of the study, and outline of GRP Report. Next, the second chapter of the body section contains a review of the literature which includes a theoretical review, empirical review, research gap, and development of a theoretical framework.

Similarly, the third chapter of the body section is about research methods. It includes the research design employed, population and sample selection, nature and sources of data, instrumentation, and methods of data analysis employed in this study. Next, the fourth chapter comprises the section on analysis and results. This chapter presents the results of the survey presented with tables and figures. It comprises the results of statistical analysis of the survey data and the major findings. The discussion, conclusion, and implications are all included in the last chapter. During the discussion, the study's findings are compared to the findings of other research in related fields. The comparison's inference is summarized in the conclusion. Finally, the practical application of the study is discussed in the implications.

CHAPTER II

LITERATURE REVIEW AND THEORETICAL FRAMEWORK

This chapter discusses theoretical literature relating to the objective of the research. It includes a review of past literature related to perceived learning and online learning satisfaction. The literature review is divided into three categories including learning theory and development of the theoretical framework.

2.1 Theoretical Review

2.1.1 Overview of Online Learning

Teaching-learning has various types according to the methods of course delivery. It includes face-to-face, hybrid (blended), and online learning methods. The face-to-face learning method depends on instructors to be physically present to teach and students to interact with each other and teachers in a physical environment (Tang, 2013). Face-to-face learning is centered on lecturers and where students are less involved (Harden & Crosby, 2000). It is usually conducted with lectures, discussions, presentations, and practicums.

The blended learning method employs face-to-face teaching with online assignments and activities. Blended learning uses a combination of at least two different methods such as: combining face-to-face learning with online learning (Walsh, 2005). Blended learning is simply combining different activities, practicum, and events with technology to provide optimum teaching courses for students. Blended learning at Nepalese Universities is usually provided by combining physical learning and online learning which commonly uses diverse platforms such as Microsoft Teams, Zoom, Google Classroom, and others. Nepal Open University is the pioneer in providing distance education by employing innovative and modern technology. The terms, blended learning and hybrid learning are used interchangeably. But Hinterberger, Fässler, and Bauer-Messer (2004) employ these two terms differently. According to them, hybrid learning is a technique of distant teaching that mainly utilizes technology in conjunction with conventional learning, whereas blended is a combination of both old and modern best practices in pedagogy, such as using online assignments and tutorials. Finally, online courses are those in which more than 80% of class instructions, coursework, and assignments are delivered virtually (Allen & Seaman, 2015).

In the ground of online education, there are two types of concepts: synchronous delivery and asynchronous delivery. Synchronous delivery refers to classes delivered at a set time when

every student is online and able to connect via cameras and microphones and other devices (Bacow et al., 2012). Synchronous delivery occurs when all students in a course are logged into the same online classroom all at once together (Simonson et al., 2013). In asynchronous delivery, the lessons are posted online. Lectures, tutorials, assignments, assessments, and activities can be accomplished before a set deadline without requiring everyone in the class to log in all at once (Simonson et al., 2013). Because the pandemic triggered the shutdown of schools and colleges, many institutions began to organize online classes. Hence online learning that will be examined in this study will be synchronous delivery.

Before the COVID-19, the majority of teaching-learning occurred in traditional brick-and-mortar schools face-to-face but when the pandemic broke out, it caused a forceful shutdown of schools and colleges forcing education institutions and universities to go online (Singh, Steele & Singh, 2021). In Nepal too, Universities began preparing to go full online mode in education. Though many universities in Nepal were unprepared for the shift in the method of education delivery, sooner or later they managed to shift from traditional on-campus learning to online learning. While on-campus classes have significant benefits, it is difficult to ignore how quickly universities, higher secondary schools, and teaching institutions shifted to online learning to maintain tutoring during the COVID-19 pandemic (Singh & Matthees, 2021; Singh et al., 2021). Over the last 10 years, online learning has increased in popularity and demand (Allen & Seaman, 2015). Moreover, now there is an increased necessity to explore and investigate students' satisfaction with online learning, particularly among public college students (Jackson, Jones, & Rodriguez, 2010). From the analysis of the research data, academicians and universities can gain insights to design better course structures, and class modules to meet students' needs. This might add to increase higher students' satisfaction with online learning (Pillay, Irving, & McCrindle, 2006).

2.1.2 Background Theories

Learning theories first appeared in the 20th century with three basic approaches: behaviorist, cognitivist, and constructivist learning theories. In general, twentieth-century learning theories were drawn from educational psychology (Harasim, 2017). Behavioral and cognitive learning theories are the two primary types of learning theories. Constructive theory – a third theory is being emphasized in many instructional design literature (Bednar et al., 1991; Duffy & Jonassen, 1991). These perspectives overlap in many ways, yet they

are sufficient to be uniquely recognized as independent methods of understanding and explaining learning.

Behaviorist Learning Theory

Learning is defined by behaviorism as a change in the form or frequency of observable performance. Learning occurs when a proper reaction is displayed in response to the presence of specific environmental stimuli. The main elements in behaviorist learning are stimulus, response, and association. How the relationship between stimuli and response is made, reinforced, and retained is the primary concern. No efforts to define the students' knowledge structure are made to determine the mental processes to be employed (Winn, 1990). Although behaviorists appreciate both the learner and the environment, they lay the greatest emphasis on the latter. The most essential feature, on the other hand, is the organization of stimuli and outcomes within the environment. The behavioral approach has been generally proven reliable in facilitating learning which involved generalization (defining concepts), associations (applying explanation), discriminations (reciting facts), and chaining (Ertmer & Newby, 2008). However, behavioral theory cannot sufficiently describe the learning of high-level skills that requires high-level processing such as the development of language, critical thinking, and problem-solving (Schunk, 1991).

Cognitivist Learning Theory

In the late 1950s, learning theory began to shift away from behavioral models and toward cognitive theory, favoring learning models and ideas from the cognitive sciences. Instead of focusing on overt, observable behavior, psychologists and educators began to place a greater emphasis on more sophisticated cognitive activities such as thinking, language, problem-solving, idea creation, and processing information (Snelbecker, 1983).

Constructivist Learning Theory

On the other hand, constructivism has become a "hot" topic and has gained attention in several fields, including instructional design (Bednar et al., 1991). Constructivism can be regarded as a learning principle that relates an experience with meaning development (Bednar et al., 1991). One of the key elements of online learning established by constructivist theory is that knowledge is constructed by learners rather than conveyed from teachers to learners.

Most cognitive psychologists consider the mind to be a tool for navigating the actual world; constructivists contend that the mind filters outside information to create its own unique reality (Jonassen, 1991a). Rather than obtaining meaning, humans create it. We can't get a predefined, "right" meaning from any event since there are so many possibilities. Students do not transfer information from the outside environment into memory; instead, they create unique interpretations grounded on their own experiences and interactions.

According to constructivist philosophy, people learn by their experience and internal reflection by expanding their understanding and knowledge of the world. As we meet new experiences and information, we are active makers of our knowledge, harmonizing our past views. We may change or reject ideas and new information based on our inquiries, investigations, analysis, and negotiation with others. The constructivist theory has been extended to give several other learning theories such as Cognitive Information Processing Theory, Collaborative Learning Theory, and Assisted Learning Theory.

Collaborative Learning Theory

Collaborative learning theory, formerly known as online collaborative learning (OCL), is another school of thought. With the development of computer networking, the collaborative theory represents an emphasis on learning networks. This theory assumes that knowledge is created by sharing socially and collaboratively (Harasim, 2017). Learners engage in online activities to discover and understand the obstacles, and then apply their new knowledge and analytical techniques to solve problems, make plans, and create explanations. The procedures that lead to conceptual comprehension, as well as knowledge outputs, are valued highly in collaborative learning. In an online discussion forum or a computer conferencing system, the debate is generally text-based and asynchronous. The instructor's role in collaborative theory is crucial: the instructor designs the course with the group discussion series centered on common knowledge and challenges in the subject and presents suitable concepts and tools to encourage informed debate. The teacher is more than just a facilitator of group discussion; he or she represents the knowledge community's "science" and helps to induct students into the field. Within this sharing framework, peer interaction dialogue is considered another important factor for successful online learning.

Cognitive Information Processing Theory

Another school of thought, cognitive information processing theory presumes that cognitive processes such as perception, attention, coding, storage, and recovery of knowledge (Bovy,

1981). It is grounded on the principle of the different learning styles of individuals implying that coaching techniques and course structure must match the learning style of individuals to learn better. This implies that the course must be structured and designed to fit the learning style of students and online courses should be designed to facilitate these cognitive processes (Eom & Ashill, 2016).

Facilitated Learning Theory

The facilitated learning theory presumes that learning takes place when an instructor creates an environment where his students feel safe to investigate the new concept and do not feel threatened by outside influences (Laird, 1985). Within this framework, Institutional support including clear instructions, updates on online class arrangements, and technical assistance to ensure that classes operate smoothly, is viewed as a critical aspect in improving learning effectiveness.

2.1.3 Determinants of Online Learning Satisfaction

Learner interface

Different technical systems allow for varying levels of engagement in connecting the gap between the learner and others (Barker, Frisbie, and Patrick, 1989). The learner interacts with course content, lecturer, and other learners through high-tech interface devices. The way users engage with the discussion interface has an impact on the online debate (Hillman, Willis & Gunawardena, 1994). In order to successfully arrange online conversations, research should be undertaken to evaluate the effects of the interface and learners' involvement patterns on learning outcomes.

In distant learning, Moore (1989) identified three forms of interactions: learner-content interaction, peer interaction, and instructor-learner interaction. Wang (2003) grouped 17 elements appropriate to assessing e-Learner Satisfaction into four dimensions: content, customization, learner interface, and learning community in his exploratory study focused on e-learners. The learner-interface interaction is regarded as one important dimension of online learning satisfaction. The learner interface has been identified as a domain where a high amount of interaction occurs in several IS-related research (Kumar, Smith, & Bannerjee, 2004). According to Swan (2004), the course interface has a major impact on the quality and number of interactions between friends, learner-instructors, and students-material. When it comes to the criterion for each dimension, it was found that respondents value most about the learner interface's stability. Learners care the most about being able to access shared

information in the learning community, and they care the most about the usability of system content (Shee & Wang, 2006).

Peer Interaction

Any educational experience would be incomplete without student interaction. It is a predictive factor of a perceived outcome in online learning, as social support is a critical coping strategy for students (Tsang et al., 2021). Moore (1989) divided learning engagement into three categories: (a) interactions with learning materials, (b) interactions with tutors, and (c) interactions amongst learners. These three interactions are recognized as critical success factors for effective online courses. Peer interaction is vital for generating a sense of community in an online context, which encourages productive and pleasant learning while also supporting students in developing problem-solving and critical thinking skills (Kolloff, 2011). Students who had a lot of peer connections reported feeling more satisfied and learning more (Swan, 2002). Students in a high-engagement online course outperformed students in a similar online course with a moderate amount of interaction (Beaudoin, 2001). As supported by test results, grades, CGPA, and satisfaction, interaction has a strong correlation with student achievement and satisfaction (Roblyer & Ekhaml, 2000). The new platform also allows students to share knowledge and ideas in order to encourage learning. Interaction between students encourages conversation and inquiry, as well as supporting ties amongst students. The development of problem-solving and critical thinking abilities is aided by student-student interaction in an online setting, which facilitates (Swan, 2002).

Teacher-Student Interaction

Teacher-Student Interaction is one of the three interactions of Moore (1989) communication framework. Several studies have found that an interactional teaching style and higher teacher-student interaction are substantially related to higher levels of learning outcomes and student satisfaction (Arbaugh, 2000; Swan, 2001). Learners' interaction with content and instructors is predominantly important for students' learning satisfaction and perceived outcome (Alqurashi, 2019), whereas peer interaction is not a crucial predictor. Online learning success necessitates interaction between the student and teacher, students, and technology (Fabry 2009). The instructor-student interaction was discovered to be a key factor in student learning and satisfaction (Sher, 2009)

Students turn to professors for more than simply comments (Vesely, Bloom, and Sherlock, 2007). Students depend upon the teacher to offer a cognitive framework such as context, and

pedagogical scaffolding to assist them in accessing and interacting with information in the course. Furthermore, students want professors to lead class debates and foster a sense of community in the classroom (Song et al., 2004; Vesely et al., 2007). According to the findings, the number, quality, regularity, and kind of student-instructor contact are all closely connected to students' perceptions about their learning experiences.

Course Design

Moore (1991) defined course design as an expression of flexibility or rigidity of a program's, instructional strategies, and evaluation method to achieve its educational objectives and as the scope to which a program can accommodate each learner's needs. The course design is about the usefulness and organization of the topic in logical order so that it is easily understandable by students. The course structure encompasses all the organization, development, and designing of curriculum, methodologies, and pedagogies along with a timeline before a course is taught, while the course is taught, and even after the course is taught.

The process and approach for developing high-quality learning environments and experiences for students is known as course design (Fink, 2010). It is part of the instructor's official job (Moore, 1997). Online courses provide students with

Online courses, with their planned design, provide students with structured exposure to course content, learning activities, and interaction. With the successful use of relevant resources and technology, students are able to access knowledge, gain skills, and exercise higher levels of thinking. Swan et al. (2012) demonstrated how course design can impact students' learning processes and learning outcomes.

Faculty Support

University needs to consider how faculty can assist learners in different ways during the planning of a course. Creating a planned learning atmosphere and offering a suitable support system for learners is crucial, especially in e-learning courses (Lee et al., 2012). Technical and pedagogical support must be provided by faculty/university in technology-based learning environments in addition to instructional support (Berge & Muilenburg, 2001). According to prior evidence from previous users of online education, permission from faculty is required to develop and develop effective online courses (Alexander et al., 2009; Panda & Mishra, 2007). Several studies have found that faculty support in the form of approval and engagement) is critical to the acceptance and execution of online education

(Betts, K. S., 2014; Brooks, 2003; Major, 2010). Faculty are important to the success of online learning. Three categories of support are identified: technical, instructional, and peer support (Lee et al., 2011).

Dialogs and course designs are examples of instructional assistance that are used to motivate learners to acquire and master content materials to accomplish learning goals. Mullen and Tallent-Runnels (2006) distinguished between intellectual and emotional support to discover that both forms of assistance were connected to a perceived learning outcome and course satisfaction in virtual learning. Providing technical support to students can be an important assistance a faculty can provide for its students. Technical support comprises backing for technical concerns that learners may encounter during hybrid or online programs. Song, Singleton, Hill, and Koh (2004) argued that technological obstacle was the key component in creating difficulties and determining learners' satisfaction in the e-learning settings.

Mediating Role of Perceived Learning

Perceived learning is a learner's subjective assessment of his or her own learning experience. The use of students' own perceptions of their learning experiences rather than achievement has been referred to as perceived learning in the works of literature. A whole portrait of learning performance can be obtained by integrating the learner's perception of learning and satisfaction (Gray & DiLoreto, 2016). E-learners' overall perception of learning has a significant relationship with the level of learning satisfaction in online classes (Richardson and Swan, 2003).

According to Rovai, Wighting, Baker, and Grooms (2009), scores might not accurately reflect students learning in class because students with prior knowledge can receive a better score based on class involvement and submission of tasks rather than the actual learning. Moreover, the scholars argued that even with the same teacher, it may be difficult to achieve grade consistency because different grades may be awarded by the same instructor at different times for the same performance. While adopting perceived learning outcomes in educational contexts may have certain advantages as well as some disadvantages, such as learners can overestimate or underestimate their self-reflect on learning progress. Perceived learning has been often cited as one of the strong determiner of the effectiveness of online learning systems (Graham & Scarborough, 2001).

Swan (2001) and Duque (2001) both found a strong correlation between perceived learning and learning satisfaction in online learning. A satisfied student is a direct outcome of a good

learning experience, and the learners' perceived learning outcome is a significant predictor of satisfaction in online education (Marks, Sibley, and Arbaugh, 2005). Student satisfaction is positively affected by perceived learning outcomes in the online environment (Ikshan, Saraswati, Muchardie, & Susilo, 2019).

Tsang et al., 2021 found student interaction and course design to be an important predictors of perceived learning outcomes. Perceived learning revealed a strong association with student satisfaction than the student initiatives. In several previous research about online learning settings, perceived learning has been accepted as a measure for assessing student learning (Horzum, Kaymak, & Gungoren, 2015; Arbaugh, 2013). Perceived learning is correlated to online course flexibility and learner-learner interaction (Marks, Sibley, & Arbaugh, 2005), cognitive, social, and teaching presence (Rockinson-Szapkiw, Wendt, Wighting, & Nisbet, 2016), teacher-student interaction (Kang & Im, 2013), learning community (Rovai & Baker, 2005), course content (Barbera et al., 2013). Students' expectations about subject knowledge and technical abilities (e.g. internet, searching, surfing), as well as the instructor's competency and support, have a strong influence on learner's perceived learning and skills gained in the online environment (Paechter, Maier, and Macher, 2010).

2.2 Empirical Review

Several research studies on online learning have been conducted since the global coronavirus pandemic enforced a change from physical learning to the online setting around the world. Tsang et al., (2021) examined the significance of peer interaction, teacher-student interaction, university support, and course structure for the effectiveness of online learning during the COVID-19 crisis. The effectiveness of online teaching-learning was measured by variables like perceived learning outcome, student initiative, and learning satisfaction. The confirmatory factor analysis revealed that peer dialogue, teacher-student interaction, and course design had a substantial effect on perceived learning outcomes. Perceived learning outcome and student initiative were found to be determining factors of learning satisfaction.

During the COVID-19, Biyiri & Dissanayake (2021) evaluated the impact of students' self-efficacy on the internet, dialogues, and self-motivated learning on satisfaction in virtual classes among tourism and hotel management students. The sample was drawn from three state institutions in Sri Lanka that provide Bachelor's Degrees in Tourism and Hospitality Management. For the final analysis, a regression analysis and correlation analysis of survey

data of 209 responses showed that all three factors are effective determiners of learners' satisfaction and internet self-efficacy is the best predictive factor to determine learner's satisfaction in online classes.

Freeman and Urbaczewski (2019) investigated the factors that are critical for students' satisfaction with online programs. The criteria discovered were quality of the program, interaction, learning style, college faculty, availability of course, and guidance. The research was conducted on MBA students who were taking online programs from 2009 to 2014 at a US university. Regression analysis of this data discovered that curriculum, course conduct, and the admissions process quality had a significant effect on learner satisfaction in e-courses.

Harsasi and Sutawijaya (2018) investigated the elements that influenced student satisfaction in online lessons. The literature found three factors: course design, flexibility and quality of class tutorials, and technology. The dependent variable was satisfaction. Only 152 valid responses were collected out of 580 self-administered questionnaires. Confirmatory factor analysis (CFA) and multiple linear regression discovered that course organization, the flexibility of online lessons, and technology quality were the influential elements to impact student satisfaction. It was recommended that universities care more about the online tutorials' quality in terms of presentation, simplicity of use, and instructor-student interaction. It is expected that improving these quality-related aspects of online lessons will improve student learning outcomes.

Ifinedo (2017) investigated the characteristics that contribute to undergraduate students' satisfaction who were studying on online blogs. To generate the constructs, the research study employed the Technology Acceptance Model and Expectation Confirmation Model. The findings were generated using the PLS-SEM. It was demonstrated that utility, compatibility, user-friendliness, enjoyment, and approval all had a positive impact on students' happiness with using the blog. Perceived enjoyment was shown to have the greatest impact on students' satisfaction with blog use.

Li, Marsh, and Rienties (2016) discovered major factors influencing student satisfaction in both online and blended courses. The research included 200 factors related to learner characteristics, presentation, module design, learner history, and learner satisfaction. The regression discovered that new and old learners both were satisfied with the learner design.

Apart from that, learner satisfaction with the quality of content, evaluation criteria, and learning load all contributed to their overall learning experience being positive.

Eom and Ashill (2016) conducted a study to learn about the various elements influencing perceived learning outcomes and student satisfaction in online education at universities. 372 legitimate answers were collected from 3285 emails sent to university students who had completed one course. The data obtained were analyzed using the SEM method. It was discovered that teacher-student discussion, learner-learner discussion, and course design were significant elements influencing both satisfaction and perceived learning. Student motivation and self-regulation were both insignificant determinants of learning outcome and student satisfaction.

Kuo and Belland (2016) explored the impact of some demographic variables including gender and age on three levels of interaction and learning satisfaction in a minority population. The findings revealed that in an online situation when group activities were not available, learner-interface interaction and teacher-student interaction were stronger indicators of student happiness. Demographic variables such as age, gender, and study hours had a significant positive impact on teacher-student interaction.

Sebastianelli, Swift, and Tamimi (2015) identified course content as the most significant factor influencing learner satisfaction in their study "Factors Affecting Perceived Learning, Satisfaction, and Quality in the Online MBA: A Structural Equation Modeling Approach." In addition, three aspects were revealed to be crucial: the curriculum, learner-learner interaction, and mentor support.

Kuo, Walker, Schroder, and Belland (2014) examined several variables that can influence student satisfaction. Student characteristics were combined with class-level factors in a regression model to predict for learner satisfaction with online learning. Hierarchical linear modeling (HLM) was adopted to run the regression model. The analysis revealed that teacher-student and student-content interactions are both significant determiners of student satisfaction, but not student-student interaction. The strongest predictor was learner-content interaction. Learner-content interaction had a stronger influence on student satisfaction than in physical education, and psychology.

Phillips and Andreas (2014) conducted a review of research studies on technology-mediated learning services (TMLS). TMLS was used to assess 85 publications from peer-reviewed

journals from a variety of domains published between 2000 and 2013 to determine the elements that influence learning success and satisfaction. The researchers discovered 31 characteristics that influenced learning and satisfaction, including attitudes toward online learning, computer literacy, self-efficacy, and learning motivation. Learning style was one of 34 factors identified as having conflicting findings or requiring further investigation.

In an online course from a South Korean university, Joo, Lim, and Kim (2013) investigated characteristics of student satisfaction, accomplishment, and persistence. The learners' locus of control, self-efficacy, and task values were all assessed. Additionally, its mediation effects on learner satisfaction and achievement were investigated. The data were analyzed using SEM. The most important elements influencing persistence were determined to be task value, satisfaction, and achievement. In addition, there was a mediating variable of predictors and perseverance for learner satisfaction.

Kuo et al. (2013) investigated how student satisfaction is a significant component in assessing distant education courses. Regression analysis employing hierarchical linear modeling (HLM) revealed that learner–teacher relationships and learner–content collaboration were the most important determinants of understudy fulfillment, and improvements in student content communication might lead to higher satisfaction.

Barbera, Clara, and Linder-Vanberschot (2013) investigated the elements that affected student satisfaction and perceptions of learning in online courses. The Pearson correlation between the institutional and outcome variables was determined, and then regression was used to establish the associations between the two variables. Learning content and course design were identified as two critical aspects determining satisfaction in the study.

Joo et al. (2012) investigated to provide a broad understanding of the determinants of student fulfillment, performance, and consistency at a South Korean online institution. Essential information was utilized in the inquiry, and Structural Equation Modeling (SEM) was performed. The data revealed that self-control, errand esteem, and self-practicality were important predictors of student pleasure, whereas self-viability and task value were important predictors of success.

Institutions can improve online course development using data gained from learning effectiveness analyses. After the pandemic, there has been a significant surge in research into the effectiveness of online learning. According to an integrative assessment of 761 papers

(Noesgaard & Orngreen, 2015), the most commonly used metrics for measuring learning effectiveness are learning outcomes, learning attitude, and satisfaction in higher education.

Noseguard & Orngreen, (2015), through an integrative review, evaluated the efficacy of e-Learning. It was revealed that resources and support, students' experience, and motivation have a considerable impact on effectiveness.

Table 2.1

Summary of Articles Reviewed

Authors	Context	Measures	Findings
Tsang, So, Chong, Lam & Chu, 2021	Student Satisfaction in online learning during the COVID-19 Pandemic	Independent Variables: Teacher-student interaction, learner-learner interaction, course structure, and university support Mediating Variables: Learning Outcome, Satisfaction Initiative Dependent Variable: Satisfaction	Peer Interaction and Course Design were found to be significant factors affecting Perceived Learning Outcomes, while Teacher-Student Interaction was found to be a predictive factor of Student Initiative.
Biyiri & Edina (2021)	Student Satisfaction in e-learning	Independent Variable: Internet Self-Efficacy Interaction, and Self-Regulated Learning Dependent Variable: Satisfaction	The best predictor of student satisfaction was found to be internet self-efficacy.
Freeman and Urbaczewski (2019)	Student Satisfaction in e-learning	Independent Variable: Interactivity, Course	Student satisfaction in online programs was influenced by course

		Quality, Style of Learning, Faculty, Availability of Course, and Advising	conduct, curriculum, and admissions process quality.
		Dependent Variable: Satisfaction	
Harsasi and Sutawijaya (2018)	Student Satisfaction in e-learning	Independent Variable: Flexibility, Course structure, Tutorial quality, Quality of the technology	Significant relation between course structure, the flexibility of the online tutorials, technology, and satisfaction of the students
		Dependent Variable: Student Satisfaction	
Li, Marsh, and Rienties (2016)	Satisfaction of the student satisfaction in blended learning	Independent Variable: Module Design, Presentation, Learner Characteristics, Learner History, and Concurrency	Overall satisfaction is influenced by learning design significantly.
		Dependent Variable: learner satisfaction.	
Eom and Ashill (2016)	Factors affecting student satisfaction & learning outcomes in the online education	Independent Variable: Motivation (Extrinsic & Intrinsic), Student Self-Regulation, Teacher-Student Interaction, Peer interaction, Instructor Activities,	Teacher-student interaction, Peer dialogue, Teacher, and course design predicted learning outcomes and student satisfaction

		and Course Structure/Design	
		Dependent Variable: User Satisfaction, Learning Outcome	
Diep, Zhu, Struyven and Blicek (2016)	Satisfaction of the students with Blended Learning Programs	LMS quality, Self- Efficacy, Perceived Achievement Goals, Information Sharing Convenience, Written Communication Confidence, Perceived Task Value Instructor Expertise Instructor Support, and Satisfaction	The most important factors for satisfaction were the instructor's skill, the students' perceived work value, and their goals.
Hung & Chou (2015)	Students' perspectives of teacher's roles in an online and blended learning environment	Discussion Facilitator (DF), Course Designer and Organizer (COO), Technology Facilitator (TF), Social Supporter (SS), and Assessment Designer (AD)	The Online Instructor Role and Behavior Scale (OIRBS) is developed by this study to investigate students' views of teachers' responsibilities in online and blended learning contexts.
Ekwunife- Orakwue and Teng (2014)	Effect of interaction on learning outcomes of students from online and blended courses	Learner Content Interaction, learner- learner interaction, instructor interaction	Student-Content Interaction is a strong predictor of learner satisfaction
Pellas (2014)	Students' individual factors influence	Self-viability, Confidence, and Self- control	In online courses, students' underpinning commitment elements are influenced by

	their commitment to learning.		self-adequacy, meta-cognitive self-control, and confidence, which are inversely related to social characteristics.
Phillips and Andreas (2014)	Learner satisfaction with online learning	A study of 85 articles from peer-reviewed journals relating to Technology mediated learning services (TMLLS)	The study identified 31 variables that affected learning and satisfaction.
Swan, Day, Bogle, and Matthews (2014)	Investigating the impact of a collaborative design-based approach to enhance online teaching and learning	Quality Matters (QM), Course Implementation (CoI)	Improvement in the learning outcome is the two-step process
Kuo, Walker, Schroder and Belland (2014)	Investigating student satisfaction estimators in online education courses.	Peer Interaction, Teacher-Student Interaction, Student Interaction With Content, Course Type, Internet Self-Efficacy, Self-Regulated Learning and Program	Learner-teacher interaction and learner-content interaction have a significant impact on student satisfaction.
Grandzol and Grandzol (2010)	Determinants of success of online courses	Independent Variable: Enrolment Size, Interaction among Students, Interaction Dependent Variable:	The findings revealed that additional contact might harm the targeted program's reputation and progress.

		Success Of Online Courses	
Selim (2007)	Critical success factors of online learning	Student, Instructor, University Support as Well as Information Technology	Information technology, Students, Instructors, and University Support were identified as four important success criteria for e-learning.
Piccoli et al., (2001)	Adequacy of an online virtual learning Environment (VLE)	Independent Variable: Human Dimension & Design Dimension Dependent Variable: Effectiveness	No significant differences in performance existed.

2.3 Research Gap

There is a sudden shift toward online education from traditional “Presence” education due to the lockdown and restrictions caused by the COVID-19 pandemic. This has led many studies to focus on the study factors affecting the students’ perceived learning, student satisfaction, and effectiveness of classes in this new learning environment. Yet, very little research has been conducted in Nepal in this area of study (e.g. Dawadi et al., 2020; Gupta et al., 2020, Sherchand, J.B., 2020; Bista et al., 2020; Garga & Kapoor, 2020). However, none of the above studies offers a clear picture of the perception of students of online learning due to the pandemic. More extensive research is required to investigate what factors Nepalese students perceive as critical for effective online education and learning satisfaction? Thus, this study attempts to fill this gap.

2.4 Conceptual Framework

In this study, the researcher intends to investigate the impact of Interaction, course design, and faculty support on learning satisfaction in online classes during the pandemic. The relationship between Interaction, University Effort, and Learning Satisfaction is mediated by students’ Perceived Learning. Eom and Ashil, (2016) blended the Technology-Mediated

Learning (TML) research framework by Lavi & Leidner, (2001) and the Virtual Learning Environment model by Piccoli, Ahmad, and Ives, (2001). The framework of our research model is derived from the work of Eom and Ashill (2016). Interaction in this study will be measured by three reliable measures, namely, learner-interface interaction, peer interaction, and teacher-student interaction (Tsang et al., 2021, Wang, 2003). The perceived learning and course design is adapted from Eom & Ashill, (2016) whereas faculty support in this study is adapted from Tsang et al (2021).

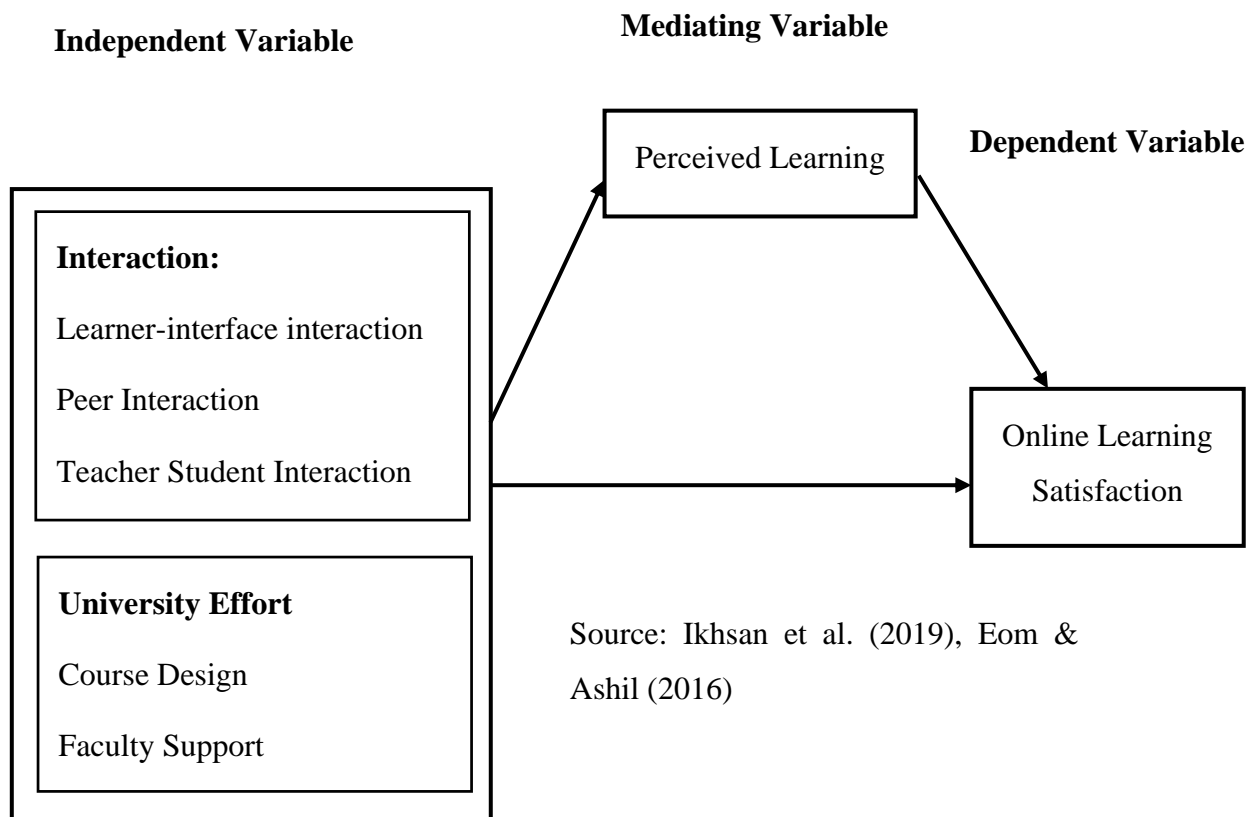


Figure 2.1. Conceptual Framework

CHAPTER III

RESEARCH METHODOLOGY

This chapter presents the research style used to investigate the effect of perceived learning and its determinant factors on online learning systems. It determines the method of survey, methods of selecting respondents, collecting data, and methods of analysis of data. This chapter is organized into research design, population, and sample, data collection method, design of the questionnaire, and method of data processing and analysis. It also presents the interpretation of data and ethical issues of the study.

3.1 Research Design

This study follows the deductive approach to examine the effect of perceived learning and its determinants on learning satisfaction in online classes. This study is based on an explanatory research design that examines the effectiveness of learner interface, peer interaction, student-teacher interaction, course content/design, and university support on learning satisfaction in online classes. It examines the mediation effect of perceived learning on the relationship between the above factors and learning satisfaction. This study employs a quantitative research strategy.

3.2 Population and Sample Size

The population of the study is university students who are pursuing bachelor's and master's degrees in management education and have taken online classes during the course. Because the population size is unknown, the sample size is determined by the number of people needed to estimate a proportion with a 95% confidence level. Cochran (1963) has given the following formula to select the representative sample size for large populations.

$$n_0 = \frac{Z^2 pq}{e^2}$$

Where,

n_0 = Size of Sample

Z^2 = abscissa of normal curve that cuts to an area α at tails

p = estimated proportion of the population with the given characteristic

q = 1-p

e = Error margin

For the unknown population, the recommended value of p and q is 50% each. At confidence level of 95 %, z value = 1.96 and sampling error e = 5%.

$$n_0 = \frac{z^2 pq}{e^2}$$

$$n_0 = \frac{1.96^2 * 0.5 * 0.5}{0.05^2} = 384$$

Hence sample size of 384 respondents is taken for this study.

3.3 Data Collection Method

This study is based on a primary source where the data were collected from a self-administered questionnaire rated by the students. There were 16 standard questions based on the objectives of the study. Questionnaires were distributed to 721 university students through emails and other social media. A total of 388 responses were obtained with a response rate of 53.25%. Data were tested for outliers and only 384 responses were retained for analysis after eliminating the outliers. Thus survey is based on primary data collected from university students who have been taking online classes since the pandemic hit Nepal and caused a lockdown. Each measuring item is rated on a seven-point Likert scale, with 1 indicating strong disagreement and 7 indicating strong agreement on the statements.

3.4 Instrumentation

The questionnaire consists of five constructs of satisfaction determinants developed by Eom, Ashill, and Wen (2016) and Wang. Y (2003) which are peer interaction, instructor-student interaction, course design, faculty support, and learner interface. Five items are adopted for the learner interface from Wang. Y (2003). Four items are adopted for both peer interaction and teacher-student interaction from Tsang et al., (2021) and Eom, Ashill, and Wen (2016). The course design has five items and faculty support has five items. These items are based on Eom, Ashill, and Wen, (2016) and Tsang et al., (2019). Perceived learning is based on Eom, Ashill, and Wen (2016). Perceived learning outcomes and student satisfaction are the two outcomes of the online education system which are commonly cited as the measures of the learning effectiveness in online education (Graham & Scarborough, 2001; Alavi, Wheeler, & Valacich, 1995). Five items for perceived learning are adopted from Tsang et al., (2021) whereas four items for learning satisfaction are adopted from Eom, Ashil, and Wen (2016).

3.5 Reliability Analysis

To provide a measure of internal consistency of items Cronbach alpha was calculated. For multiple-item measurements of a construct, calculating Cronbach's alpha has become normal practice in research (Tavakol & Dennick, 2011).

Table 3.1

Cronbach's alpha of Constructs

Construct and Items	Number of Items	Cronbach's alpha (α)
Learner interface	5	0.000
Peer Interaction	4	0.872
Teacher Student Interaction	4	0.881
Course Design	3	0.843
Faculty Support	5	0.897
Perceived Learning	5	0.932
Online Learning Satisfaction	4	0.923

In general, data with the alpha value ranging from 0.70 to 0.95 are considered to be reliable. The result of the reliability test shows that all the constructs have Cronbach's alpha value greater than 0.7 which indicates acceptable internal consistency.

3.6 Data Analysis Method

The data analysis is conducted at three different stages. At first, descriptive statistics for the measurement of a demographic profile are conducted using IBM SPSS 25. Preliminary data analyses such as frequency, percentage, mean and standard deviation are calculated to measure the overall profile of the respondents. Moreover, a normality test is performed where skewness and kurtosis were measured with a normal histogram plot.

Second, SmartPLS 3 is used for data validation and collinearity test. Composite reliability, Cronbach's alpha, and Average Variance Extracted (AVE) are calculated to measure the internal consistency of data. The acceptable range from 0.7 to 0.95 (Hair et al., 2020) and AVE value greater than 0.5 (Hair et al., 2020) are taken as the threshold value for convergent validity. Similarly, data having Cronbach's alpha greater than 0.7 are accepted for convergent validity. Further, Fornell Larcker Criterion, Heterotrait-Monotrait Ratio, and Cross Loading are used for measurement for confirming discriminant validity. Likewise, the Square root of each construct's AVE must be bigger than its correlation with other constructs

to meet the Fornell Larcker criteria. HTMT value below 0.9 is accepted as it suggests the establishment of discriminant validity between two reflective constructs. Likewise, cross-loading values less than 0.7 establish discriminant validity in the construct (Henseler, et al., 2014). Variation Inflation Factor (VIF) value less than 5 is included to prove that there are no issues of multicollinearity in the data. Correlation analysis is conducted to understand the significance of the relationship between learner-interface interaction, peer interaction, teacher-student interaction, course design, faculty support, perceived learning, and online learning satisfaction.

Next, structural equation modeling is conducted using Smart PLS. path model is assessed to test all hypotheses. Their direct and indirect effect is assessed to measure the significance of mediation of perceived learning on the relationship between learner interface, peer interaction, teacher-student interaction, course design, faculty support, and online learning satisfaction. The study makes use of both SPSS 25 and the Smart PLS 3. IBM SPSS 25 is used for data screening, eliminating outliers, descriptive statistics, graphs, and so forth. Smart PLS is effective for determining validity, such as convergent and discriminant validity. Furthermore, when there is a serial mediating variable Smart PLS is more beneficial (Hair et al., 2014).

3.7 Ethical Considerations

Saunders et al., (2016) define ethics as behavioral principles that guide research conduct for the rights of individuals who are the topic of the study or impacted by it in general. Since this dissertation incorporates human participants, ethical questions arise during the design of the study, data collection, and analysis. In this thesis, a quantitative investigation was undertaken through the use of an electronically administered questionnaire and a survey study. When distributing the survey questionnaire to the firms, a full description of the study's purpose, as well as a brief introduction of the researcher was incorporated.

The idea of informed consent was fulfilled as participants were given sufficient information and assurances regarding taking part in the survey, ensuring that they were aware of the consequences and willingly agreed to take part in the survey (Bryman & Bell, 2015; Saunders et al., 2016). The respondents were advised ahead of time that the survey findings would be included in the dissertation. Respondents were informed that their names and identification would be kept confidential and anonymous. Thus confidentiality of data and anonymity of participants were maintained with upheld privacy of respondents (Bryman & Bell, 2015).

CHAPTER IV
ANALYSIS AND RESULTS

This t presents the findings on the relationship between Interactions, University Effort, Perceived Learning, and Online Learning Satisfaction. Descriptive analysis is performed using IBM SPSS. Appropriate measurement models and hypotheses were analyzed and tested using Smart PLS 3. Descriptive and reliability statistics from the survey, the results of tests used to analyze the stated hypotheses, and a summary of the findings are provided.

4.1 Demographic Profile of Respondents

Table 4.1

Respondents' Demographic Profile

		Frequency	Percentage
Gender			
	Male	216	56.25
	Female	168	43.75
Age			
	16-20	40	10.42
	21-25	198	51.56
	26-30	136	35.42
	31 & above	10	2.60
Education Level			
	Bachelor	150	39.10
	Master	234	60.90
University			
	Public	283	73.70
	Private	101	26.30
Previous Experience			
	None	190	49.48
	Little	107	27.86
	Enough	87	22.66
Geographical Location			
	Urban	300	78.13
	Rural	84	21.88

Table 4.1 provides the demographic information of respondents. A total of 384 responses were collected through the online questionnaire. Respondents are divided into seven categories by gender, age, education level, university, previous experience, and geographical location. Out of 384 respondents, the majority are male (56.25%) and the remaining 43.75% are female. The largest representation is from 21-25 years (51.56%) followed by 26-30 years (35.42%). 10.42% of respondents are of age 16-20 years. The minimal representation is from the 31 and above year category which is only 2.60%.

Out of the 384 respondents 39.10% respondents are studying bachelor's, and 60.90% respondents are pursuing a master's degree in management. It is observed that the majority of respondents are pursuing bachelors. Similarly, 73.70% of the respondents are studying in public universities, and the remaining 26.30% of them are studying in private universities. It is observed that major respondents are from public universities.

Furthermore, regarding previous experience with online classes before the pandemic, the majority of respondents (49.48%) have no experience. 27.86% of respondents responded that they have little experience with online classes before the pandemic. Only 22.66% of the people have previous experience with online classes before the pandemic. Likewise, the majority of the respondents (78.13%) takes online classes from the urban area, and only 21.88% from the rural area during the online classes during the pandemic.

Table 4.2

Respondent profile of Devices used for Online Class

Devices	Frequency	Percentage
Smart Phone, Laptop, Desktop, Tablet/iPad	7	1.82%
Smart Phone, Laptop, Desktop	12	3.13%
Smart Phone, Laptop, Tablet/iPad	9	2.34%
Smart Phone, Laptop	147	38.28%
Smart Phone, Desktop	1	0.26%
Laptop, Desktop	2	0.52%
Desktop, Tablet/iPad	1	0.26%
Smart Phone	97	25.26%
Laptop	104	27.08%
Desktop	3	0.78%
Tablet/iPad	1	0.26%

Table 4.2 presents that Laptops and Smart Phones are the most used devices for online classes during the pandemic. The majority of respondents take online classes using smartphones and laptops both (38.28%) during the pandemic. It is followed by 27.08% of respondents who attend online classes using laptops. 25.26% of respondents use smartphones to attend online classes. 3.31% of the respondents use smartphones, laptops, and desktops altogether. 2.34% of responses are from those who use a smartphone, laptop, and tablet/iPad. 1.82% of the respondents uses a smartphone, laptop, desktop, and tablet/iPad for online classes during the pandemic. Only 0.78% of respondents attend their online classes using the desktop. 0.52% of respondents attend their online class on laptops and desktops.

Table 4.3

Internet Connection at Home

Internet Connection at Home	Frequency	Percentage
Regular Wi-Fi, Mobile Data	81	21.09%
Regular Wi-Fi	244	63.54%
Mobile Data	57	14.84%

Table 4.3 shows the internet connection facility available for students to connect to online classes during the pandemic. Out of 384 respondents, the majority of students have regular Wi-Fi to attend online classes. Only 14.84% of respondents reported that they use mobile data for online classes. Similarly, 21.09% responded that they use both regular Wi-Fi and mobile data for the online classes during the pandemic.

Table 4.4

VC Platform used for Online Classes

VC Platform	Frequency	Percentage
Zoom, Microsoft Teams, Google Meet/Google Classroom	63	16.41%
Zoom, Microsoft Teams	105	27.34%
Zoom, Google Meet/Google Classroom	16	4.17%
Microsoft Teams, Google Meet/Google Classroom	8	2.08%
Zoom	74	19.27%
Microsoft Teams	96	25.00%
Google Meet/Google Classroom	22	5.73%

Table 4.4 presents a composition of respondents' profiles on the video conferencing platform used for the online classes during the pandemic. The majority of students (27.34%) use Zoom and Microsoft Teams for taking online classes. It is followed by 25% of students who use Microsoft Teams only for their online classes. Likewise, 19.27% of students study in Zoom during the pandemic. 5.73% of the student uses Google Meet/Classroom for their online classes. 16.41% of the students responded that they use all three platforms for the online classes during the pandemic.

4.2 Descriptive Statistics of Independent Variables, Mediating Variables, and Dependent Variables

Table 4.5

Position of Learner-Interface Interaction

Learner-Interface Interaction	Variables	N	Mean	S.D
I found the learning management system simple to use.	LI1	384	4.755	1.743
I found the online learning system user-friendly.	LI2	384	4.745	1.652
I easily understood the course content from the learning system.	LI3	384	3.977	1.709
I had no issues of disconnectedness, separation, and distractions during online classes.	LI4	384	2.831	1.713
I found the system easy to search and find the information needed.	LI5	384	4.576	1.746
Learner-interface interaction			4.177	1.313

Table 4.5 depicts the position of the learner-interface interaction. The result shows that students found the online learning system easy to use with the highest mean score of 4.755 (SD=1.743). Students found the online learning system user-friendly and easy to search to find the information. But the table shows that students are unable to easily understand the content of the online learning system. The lowest mean (2.831) indicates that students have issues of disconnectedness, separation, and distractions in online classes during the pandemic. The overall mean score for learner-interface interaction is 4.177 (SD=1.313) which shows that despite the issues of disconnectedness, separation, and distractions,

students had positive and constructive interactions with the learner interface during their online classes during the pandemic.

Table 4.6

Position of Peer Interaction

Peer Interaction	Variables	N	Mean	S.D
I had frequent positive peer interactions.	PI1	384	3.898	1.832
Peer interaction level was normally high in the online classes.	PI2	384	3.141	1.729
In online classes, I learned more from my classmates than in traditional classes.	PI3	384	3.070	1.777
Peer interaction helped to improve the quality of learning in online classes.	PI4	384	3.258	1.784
Peer Interaction			3.342	1.513

Table 4.6 exhibits the position of peer interaction in online classes during the pandemic. All the items have a mean score of less than 4 which shows that students had less peer interaction in online classes during the pandemic than they used to be in physical classes. It shows that students do not have frequent peer interaction and the quality of learning is not improved. The lowest mean 3.07 (SD=1.777) indicates that students have not learned less from their peers in online classes than in physical classes. The overall score of peer interaction (mean=3.342, SD=1.523) indicates that the students agree that peer interactions were less frequent and less effective during online learning compared to physical classes.

Table 4.7

Teacher-Student Interaction

Teacher-Student Interaction	Variables	N	Mean	S.D
I had frequent positive interactions with teachers.	TS1	384	3.654	1.743
There were high-level teacher-student Interactions.	TS2	384	3.284	1.746
In online classes, the interaction between teachers and students helped me to boost the quality of my learning.	TS3	384	3.607	1.770
I found teacher-student Interaction a very important learning tool.	TS4	384	4.263	1.826
Teacher-Student Interaction			3.702	1.520

Table 4.7 describes the position of teacher-student interaction. It shows that students find teacher-student interaction as an important learning tool with a mean score of 4.263 (SD=1.826). All other items have a mean score of less than 4 which indicates that students have less frequent interactions with teachers in terms of frequency as well as quality in online classes during the pandemic. Similarly, the least mean score of 3.284 indicates that the quality of learning has not improved in the online class. The overall score of teacher-student interaction (mean=3.702, SD=1.520) indicates that the students agree that interactions with instructors in online classes were less frequent, and less effective compared to physical classes.

Table 4.8

Position of Course Design

Course Design	Variables	N	Mean	S.D
Before the session, the course objectives and procedures were well communicated.	CD1	384	4.18	1.741
Class modules were logically organized in an understandable manner.	CD2	384	4.15	1.659
The online course materials were typically intriguing, and engaging, and piqued my interest in learning.	CD4	384	3.82	1.782
Course Design			4.05	1.51

Table 4.8 represents the position of course design in online classes during the pandemic. It shows that course objectives and procedures of classes are clearly communicated to students before the session on online classes during the pandemic with a mean score of 4.18 (SD=1.741). It shows that class modules are logically organized understandably. However, the mean score of 3.82 indicates that students find course materials non-interesting and non-engaging. The overall score of course design (mean=4.05, SD=1.51) indicates that the students agree that their university/faculty was able to provide an appropriate course structure (or course materials) timely to engage students in a new learning environment in online classes during the pandemic.

Table 4.9

Position of Faculty/University Support

Faculty/University Support	Variables	N	Mean	S.D
Clear instruction and guidelines were provided by University before online classes.	FS1	384	4.50	1.737
My university kept me up to date and well-informed about the scheduling of classes.	FS2	384	4.76	1.707
The University could provide me with immediate technological assistance.	FS3	384	3.82	1.888
University provided an adjusted syllabus and exams.	FS4	384	4.24	1.839
The university made every effort to ensure smooth running of virtual classes.	FS5	384	4.30	1.853
Faculty/University Support			4.33	1.52

Table 4.9 describes the position of university support to students in online classes during the pandemic. The highest mean score of 4.76 indicates that students feel that their university kept them well informed about the arrangement of online classes. The result shows a positive attitude of students towards university support for online classes during the pandemic. However, the mean score of 3.82 (SD=1.888) indicates students feel that the university has been unable to provide instant technical support for online classes during the pandemic. The overall score of faculty support (Mean=4.33, SD=1.52) indicates that the students agree that their university/faculty were able to provide constructive guidelines and constant support to ensure their smooth online classes during the pandemic.

Table 4.10

Position of Perceived Learning

Perceived Learning	Variables	N	Mean	S.D
Online classes have the same academic quality as traditional classes.	PL1	384	3.41	1.759
I learned just as much in online classes as I did in actual ones.	PL2	384	3.25	1.744
Comparatively, I learned more in e-classes than in physical classes.	PL3	384	3.11	1.848
There was a better quality of learning experience in virtual classes.	PL4	384	3.10	1.818
My productivity increased during online classes.	PL5	384	3.29	1.907
Perceived Learning			3.23	1.61

Table 4.10 describes the position of perceived learning of students in online classes during the pandemic. All the items have mean scores of less than 4 which indicates that students slightly agree that learning decreased during online classes than in physical classes. Students perceived that the academic quality of online classes was not on par with physical classes. Similarly, students find that they have learned less in online classes compared to traditional physical classes. Also, the students find that the quality of the learning experience is not better in online classes as compared to that in face-to-face classes. The overall score of perceived learning (Mean=3.23, SD=1.61) indicates that the students do not perceive that they learned more and better in online classes than in physical classes. Students perceived that their quality of education and productivity did not increase in online classes during the pandemic than in physical classes before the pandemic.

Table 4.11

Online Learning Satisfaction Scores

Online Learning Satisfaction	Variables	N	Mean	S.D
I would take Online Classes again in the future.	OLS1	384	3.63	1.828
I would recommend Online Classes to others.	OLS2	384	3.60	1.778
I was satisfied with online learning overall.	OLS3	384	3.66	1.839
As a whole, Online Classes were Successful.	OLS4	384	4.06	1.862
Online Learning Satisfaction			3.74	1.65

Table 4.11 illustrate the position of online learning satisfaction in online classes during the COVID-19 pandemic. As a whole students were slightly dissatisfied with online learning. It shows that students are less likely to take online classes again. Also, Students are less likely that they would recommend online classes to others. But OLS4 has a mean score of 4.06 (SD=1.862) which indicates that online classes during the pandemic were successful overall. The overall score of online learning satisfaction (Mean=3.74, SD=1.65) indicates that the students were not satisfied with their learning in a new online setting as they were in physical classes before the pandemic.

4.3 Normality Test**4.3.1 Shapiro-Wilk test**

Table 4.12

Shapiro-Wilk Test

Variables	Shapiro-Wilk		
	Statistic	df	Sig.
Learner interface	0.983	384	0.000
Peer Interaction	0.959	384	0.000
Teacher Student Interaction	0.967	384	0.000
Course Design	0.973	384	0.000
Faculty Support	0.963	384	0.000
Perceived Learning	0.933	384	0.000
Online Learning Satisfaction	0.963	384	0.000

Table 4.12 depicts the Shapiro-Wilk test conducted for normality. The result shows that the test is significant having a p-value lower than 0.05. Hence data are not normal. A normal probability plot is a graphical tool for determining if a data set is normally distributed or not (Chambers et al., 1983).

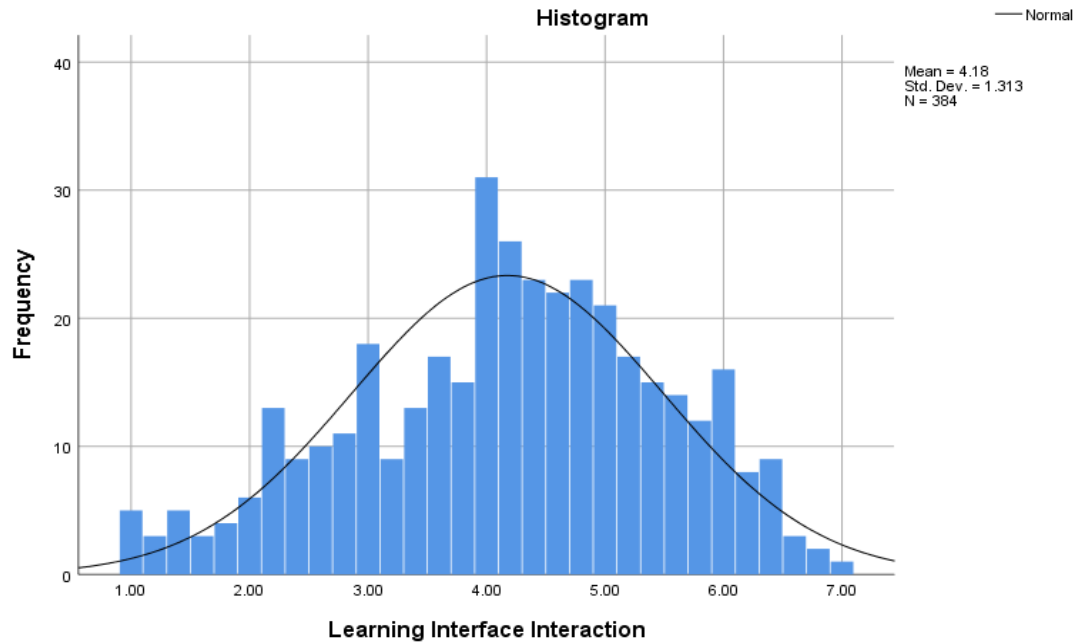


Figure 4.1. Histogram of Learner interface

Figure 4.1 depicts that data for the survey of learner interface is left-skewed and not normally distributed.

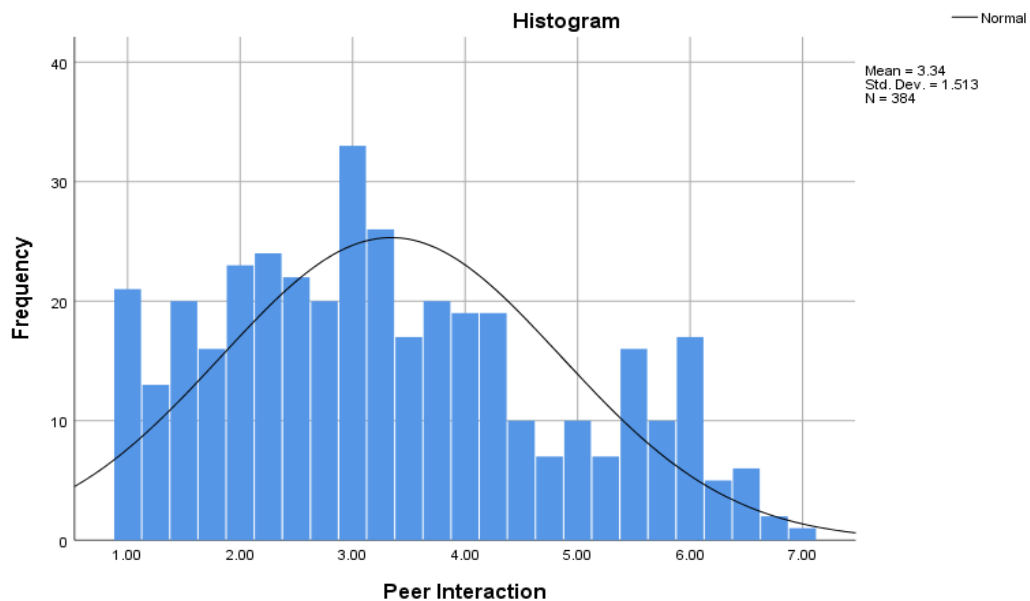


Figure 4.2. Histogram of Peer Interaction

The data set for peer contact is slightly right-skewed and consequently not normally distributed, as shown in Figure 4.2.

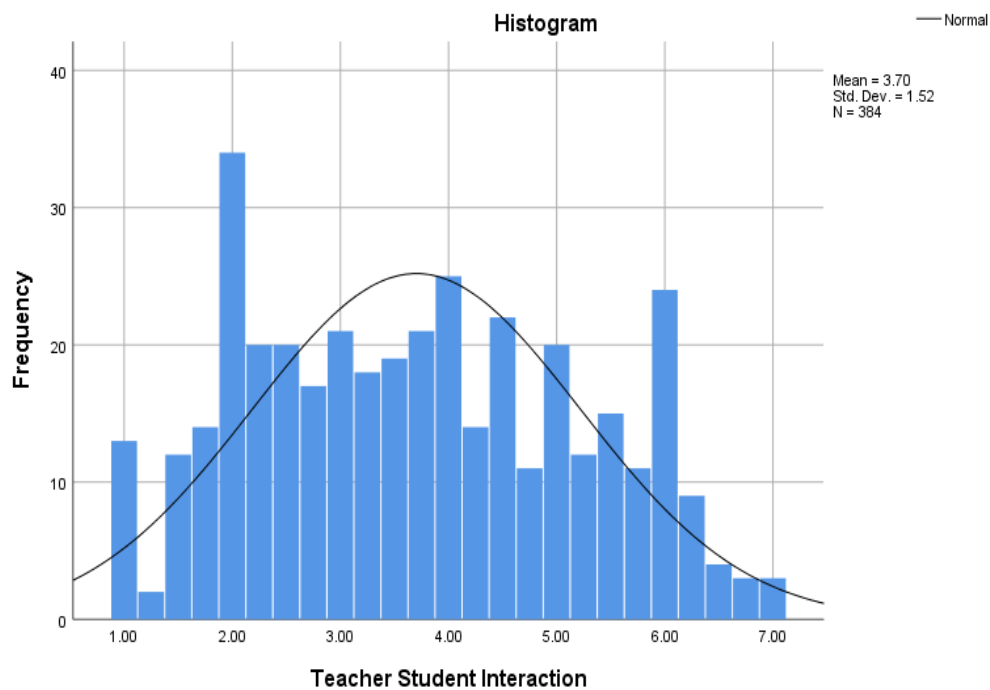


Figure 4.3. Teacher-Student Interaction

Figure 4.3 shows that the data set for the teacher-student interaction has a slightly positively skewed distribution and hence is not normally distributed.

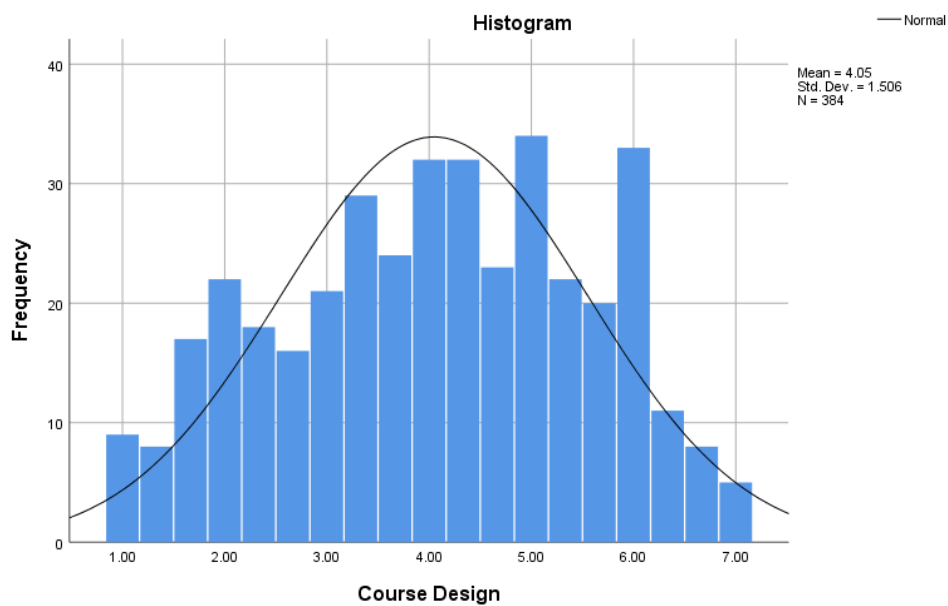


Figure 4.4. Histogram of Course Design

From figure 4.4 it can be observed that the data set for course design has scores concentrated towards the center but it does not have a normal distribution.

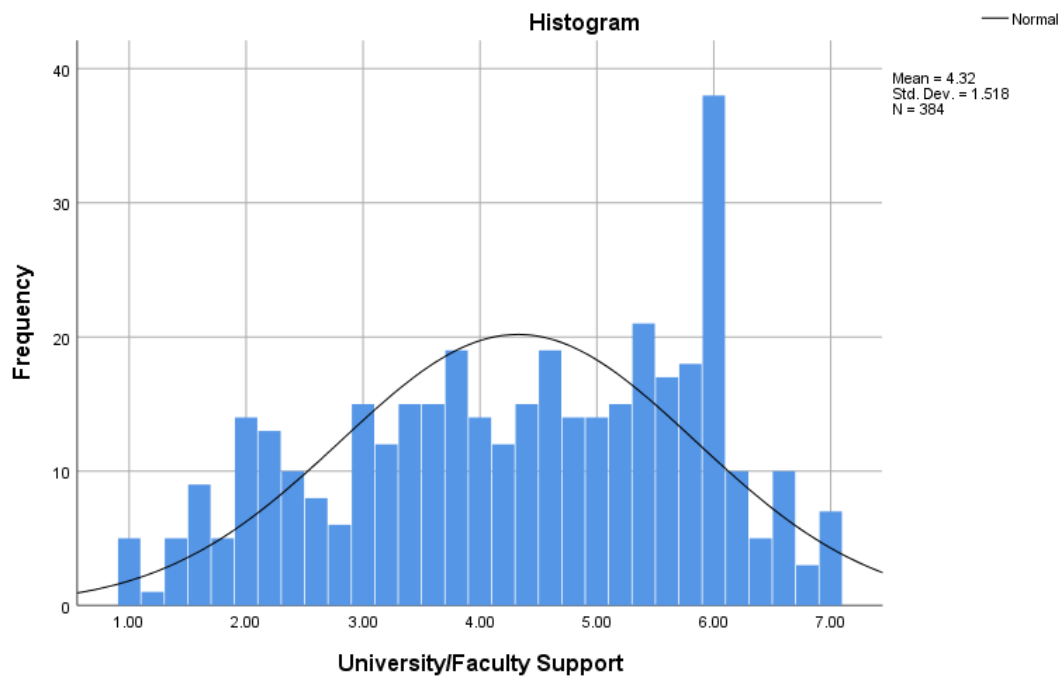


Figure 4.5. Histogram of University/Faculty Support

From figure 4.5 it can be observed that the data set for the survey of university/faculty support is negatively skewed towards the left, hence it is not normally distributed.

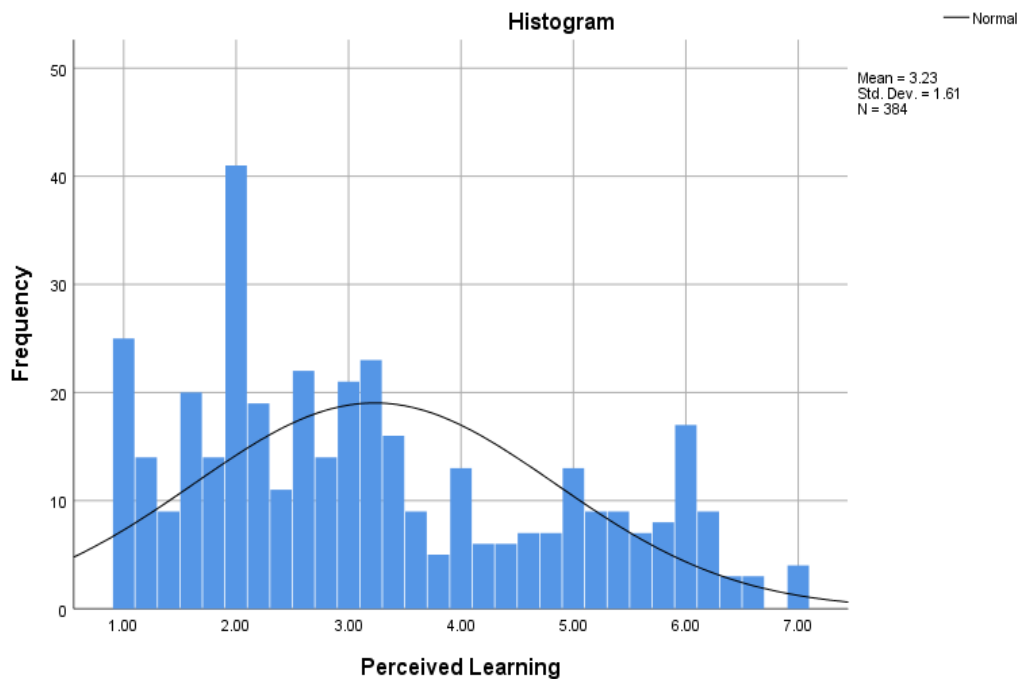


Figure 4.6. Histogram of Perceived Learning

From figure 4.6, it is observed that the data set for the survey of perceived learning is positively skewed towards the right. Thus, it is not normally distributed.

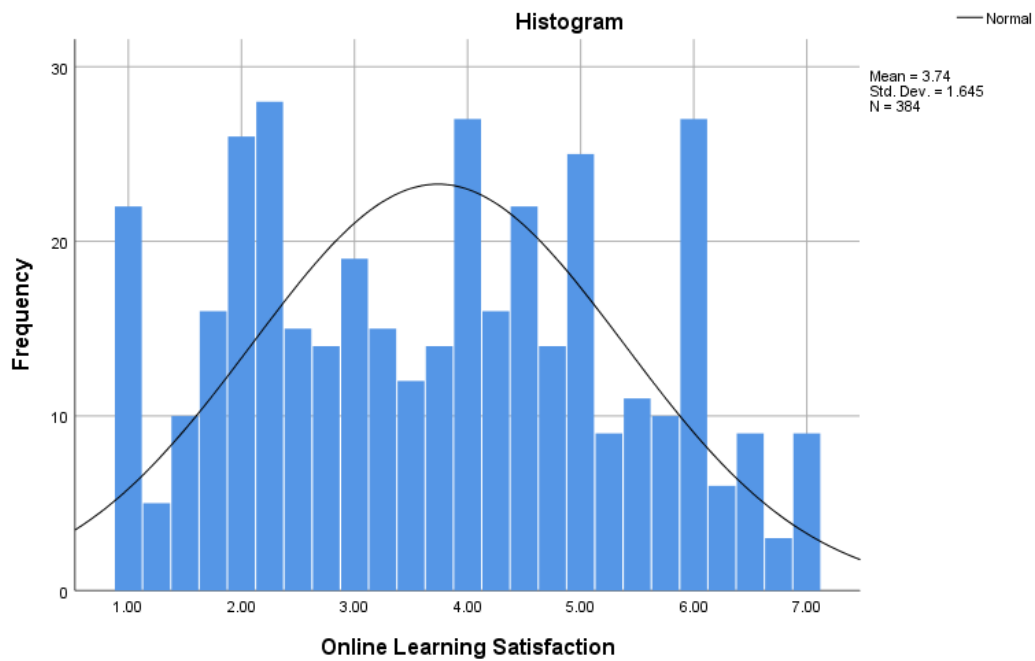


Figure 4.7. Histogram of Online Learning Satisfaction

Figure 4.7 shows that the data set for the survey of online learning satisfaction is slightly positively skewed towards the right. Thus data set is not normally distributed.

4.4 Measurement Model

The measurement model examines the association between latent variables and their indicators. The measurement model tests psychometric dimensions including outer loading, Composite Reliability, Chronbach's alpha, and Average Variance Extracted (AVE).

4.4.1 Model Validation Result (Composite Reliability and Validity)

Table 4.13

Model Validation Result (Composite Reliability and Validity)

Construct and Items	Factor Loading	CR	α	AVE
Learner-interface interaction		0.874	0.825	0.582
LI1	0.729			
LI2	0.782			
LI3	0.822			
LI4	0.730			
LI5	0.746			
Peer Interaction		0.913	0.872	0.726
PI1	0.750			
PI2	0.889			
PI3	0.872			
PI4	0.888			
Teacher Student Interaction		0.919	0.881	0.740
TS1	0.842			
TS2	0.915			
TS3	0.921			
TS4	0.752			
Course Design		0.904	0.843	0.759
CD1	0.858			
CD2	0.894			
CD4	0.861			
Faculty Support		0.923	0.897	0.707
FS1	0.836			
FS2	0.841			
FS3	0.839			
FS4	0.837			
FS5	0.85			
Perceived Learning		0.949	0.932	0.788
PL1	0.822			
PL2	0.92			
PL3	0.901			

PL4	0.915			
PL5	0.877			
Online Learning Satisfaction		0.945	0.923	0.813
OLS1	0.878			
OLS2	0.932			
OLS3	0.923			
OLS4	0.872			

Note. CR: Composite Reliability; α : Cronbach's Alpha; AVE: Average Variance Extracted

Construct reliability of the measurement model, both Cronbach's alphas and composite reliability of constructs are larger (except TS5, CD3, and CD5) than 0.7 which indicates acceptable internal consistency (Fornell & Larcker, 1981). Items TS5, CD3, and CD5 having outer loading values below 0.7 are removed to increase the internal consistency of the model. Convergent validity tests the degree to which the items of a construct relate to each other. Table 4.13 shows that all the constructs have AVE values higher than 0.5, hence, it exhibits adequate convergent validity (Doll et al., 1995; Fornell & Larcker, 1981). Table 4.13 provides evidence that all the criteria for internal consistency are met.

4.4.2 Discriminant Validity

Table 4.14

Fornell-Larcker Test

Variable	LI	PI	TS	CD	FS	PL	OLS
LI	0.763						
PI	0.504	0.852					
TS	0.482	0.633	0.860				
CD	0.587	0.541	0.594	0.871			
FS	0.488	0.407	0.480	0.621	0.841		
PL	0.504	0.631	0.542	0.529	0.441	0.888	
OLS	0.561	0.532	0.543	0.585	0.503	0.686	0.901

The purpose of the discriminant validity evaluation is to guarantee that a reflective construct in the PLS path model has the strongest connections with its indicators in comparison to any other construct (Hair et al., 2022). The Fornell–Larcker criteria were used to determine discriminant validity, which refers to how dissimilar each construct in the final model is from the other construct (Fornell & Larcker, 1981). Fornell-Larcker test compares the square root of AVE to correlations of any other construct. The square root of AVE is presented at the diagonal of the table. Table 4.14 exhibits that all the square root of AVE is greater than their subsequent inter-construct correlation, thus, satisfactory discriminant validity is revealed (Hair et al., 2014).

Table 4.15

Cross Loading

Variables	LI	PI	TS	CD	FS	PL	OLS
LI1	0.729	0.224	0.227	0.361	0.380	0.195	0.346
LI2	0.782	0.289	0.301	0.424	0.409	0.242	0.396
LI3	0.822	0.433	0.488	0.537	0.411	0.452	0.498
LI4	0.730	0.548	0.403	0.415	0.270	0.556	0.446
LI5	0.746	0.307	0.334	0.467	0.425	0.335	0.408
PI1	0.437	0.750	0.464	0.448	0.326	0.416	0.432
PI2	0.434	0.889	0.533	0.467	0.391	0.574	0.456
PI3	0.389	0.872	0.536	0.418	0.292	0.575	0.442
PI4	0.463	0.888	0.617	0.514	0.377	0.571	0.484
TS1	0.445	0.512	0.842	0.517	0.429	0.444	0.448
TS2	0.424	0.625	0.915	0.530	0.414	0.552	0.503
TS3	0.430	0.615	0.921	0.530	0.409	0.510	0.510

TS4	0.362	0.391	0.752	0.472	0.415	0.324	0.398
CD1	0.526	0.395	0.484	0.858	0.559	0.348	0.444
CD2	0.557	0.426	0.491	0.894	0.569	0.426	0.511
CD4	0.463	0.563	0.564	0.861	0.503	0.570	0.554
FS1	0.431	0.276	0.361	0.556	0.836	0.312	0.390
FS2	0.426	0.250	0.335	0.526	0.841	0.299	0.415
FS3	0.357	0.385	0.400	0.497	0.839	0.412	0.408
FS4	0.419	0.380	0.467	0.507	0.837	0.415	0.459
FS5	0.423	0.396	0.436	0.529	0.850	0.394	0.432
PL1	0.435	0.563	0.471	0.524	0.464	0.822	0.539
PL2	0.487	0.577	0.515	0.500	0.414	0.920	0.631
PL3	0.443	0.590	0.470	0.428	0.364	0.901	0.606
PL4	0.425	0.542	0.456	0.442	0.345	0.915	0.626
PL5	0.445	0.529	0.491	0.454	0.370	0.877	0.639
OLS1	0.464	0.445	0.461	0.482	0.458	0.594	0.878
OLS2	0.502	0.485	0.501	0.526	0.437	0.662	0.932
OLS3	0.509	0.502	0.513	0.527	0.430	0.656	0.922
OLS4	0.548	0.485	0.482	0.573	0.491	0.558	0.872

Table 4.15 shows the cross-loading of the constructs. The table reveals that there is no issue with cross-loading as the cross-loading values of the items are less than 0.7 with other constructs (Hair et al., 2014). It can be observed that all the primary cross-loadings have a minimum difference of 0.1 with the secondary cross-loadings of other constructs.

Table 4.16

Heterotrait-Monotrait Ratio (HTMT)

Variables	LI	PI	TS	CD	FS	PL	OLS
LI							
PI	0.558						
TS	0.538	0.71					
CD	0.695	0.619	0.685				
FS	0.577	0.455	0.541	0.718			
PL	0.529	0.697	0.588	0.580	0.477		
OLS	0.626	0.594	0.600	0.654	0.551	0.739	

Henseler, Ringle, & Sarstedt (2015) argues that Fornell-Larcker and the cross-loading approach are not sufficient to measure discriminant validity. Hence Heterotrait-Monotrait (HTMT) ratio scale is recommended to test discriminant validity. There is a problem with discriminant validity in the construct if the HTMT ratio is greater than 0.9 (Henseler, Ringle, & Sarstedt, 2015). From table 4.16, it can be observed that all the HTMT ratios are below the threshold value of 0.9. Thus there is no issue of discriminant validity at constructs.

4.4.3 Collinearity Test

From table 4.17, it is evident that all the items of the constructs in the research have a variance inflation factor (VIF) value less than 5 indicating no issues of multi collinearity. Hence all the items of the constructs are retained for the research.

Table 4.17

Collinearity Test Statistics

Variables	VIF
CD1	2.411
CD2	2.639
CD4	1.657
FS1	3.544
FS2	3.679
FS3	2.342
FS4	2.234
FS5	2.371
LI1	2.461
LI2	2.838
LI3	1.860
LI4	1.459
LI5	1.587
OLS1	3.102
OLS2	4.499
OLS3	3.894
OLS4	2.757
PI1	1.650
PI2	2.634
PI3	2.598
PI4	2.829
PL1	2.384
PL2	4.129
PL3	3.684
PL4	4.532
PL5	3.120
TS1	2.122
TS2	3.633
TS3	3.760
TS4	1.680

4.5 Model Fit

The discrepancy between the observed and model inferred correlation matrix is measured by the Standardized Root Mean Square Residual (SRMR). The differences between actual and predicted correlation are used to determine the fit criterion's absolute value.

Table 4.18

SRMR Statistics

	Original Sample (O)	Sample Mean (M)	0.95%
Saturated Model	0.062	0.032	0.035
Estimated Model	0.062	0.033	0.036

The SRMR was presented by Henseler et al. (2014) as a PLS-SEM as a measure for goodness of fit that can be used to avoid model misspecification. More conservatively, Hu & Bentler (1999) defined that SRMR values less than 0.10 or 0.08 are considered a good fit. Table 4.18 exhibits that the SRMR value for the model is less than 0.08. Thus, the model fit of this research study is found to be fairly good.

4.6 Correlation Matrix

Table 4.19

Correlation Matrix

	LI	PI	TS	CD	FS	PL	OLS
LI	1						
PI	.474**	1					
TS	.459**	.622**	1				
CD	.579**	.533**	.592**	1			
FS	.495**	.405**	.483**	.624**	1		
PL	.464**	.627**	.531**	.515**	.438**	1	
OLS	.547**	.534**	.541**	.578**	.503**	.685**	1

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

Table 4.19 exhibits that all the correlation values are significant at a p-value of 0.01.

4.6.1 Correlation between independent variables and Perceived Learning

From table 4.19, it is observed that Learner-interface interaction and Faculty/University Support have a moderate correlation ($r=0.464$ & $r=0.438$ respectively) on Perceived Learning. It suggests that an increase in the quality of learner-interface interaction and faculty support will lead to a moderate increase in perceived learning in students in online classes during the pandemic.

Moreover, the table shows that Peer Interaction, Teacher-Student Interaction, and Course Design have a strong correlation ($r=0.627$, $r=0.531$, & $r=0.515$ respectively) with Perceived Learning. It indicates that an increase in peer interaction, teacher-student interaction, and university support positively affect perceived learning among students in online classes during the pandemic.

4.6.2 Correlation between independent variables and Online Learning Satisfaction

It is observed that all the independent variables have a strong correlation with online learning satisfaction. Among independent variables, Course Design has the strongest correlation ($r=0.578$). Similarly, Learner-interface interaction, Peer Interaction, Teacher Student Interaction, and Faculty Support have moderately strong correlation ($r=0.547$, $r=0.534$, $r=0.541$, & $r=0.503$ respectively). It indicates that any positive change in any independent variable leads to a positive change in learning satisfaction.

4.6.3 Correlation between Perceived Learning and Online Learning Satisfaction

It is observed that Perceived Learning also has a strong correlation with Online Learning Satisfaction ($r=0.685$). It suggests that an increase in Perceived Learning leads to a moderately strong increase in learning satisfaction.

4.7 Structural Equation Model Analysis

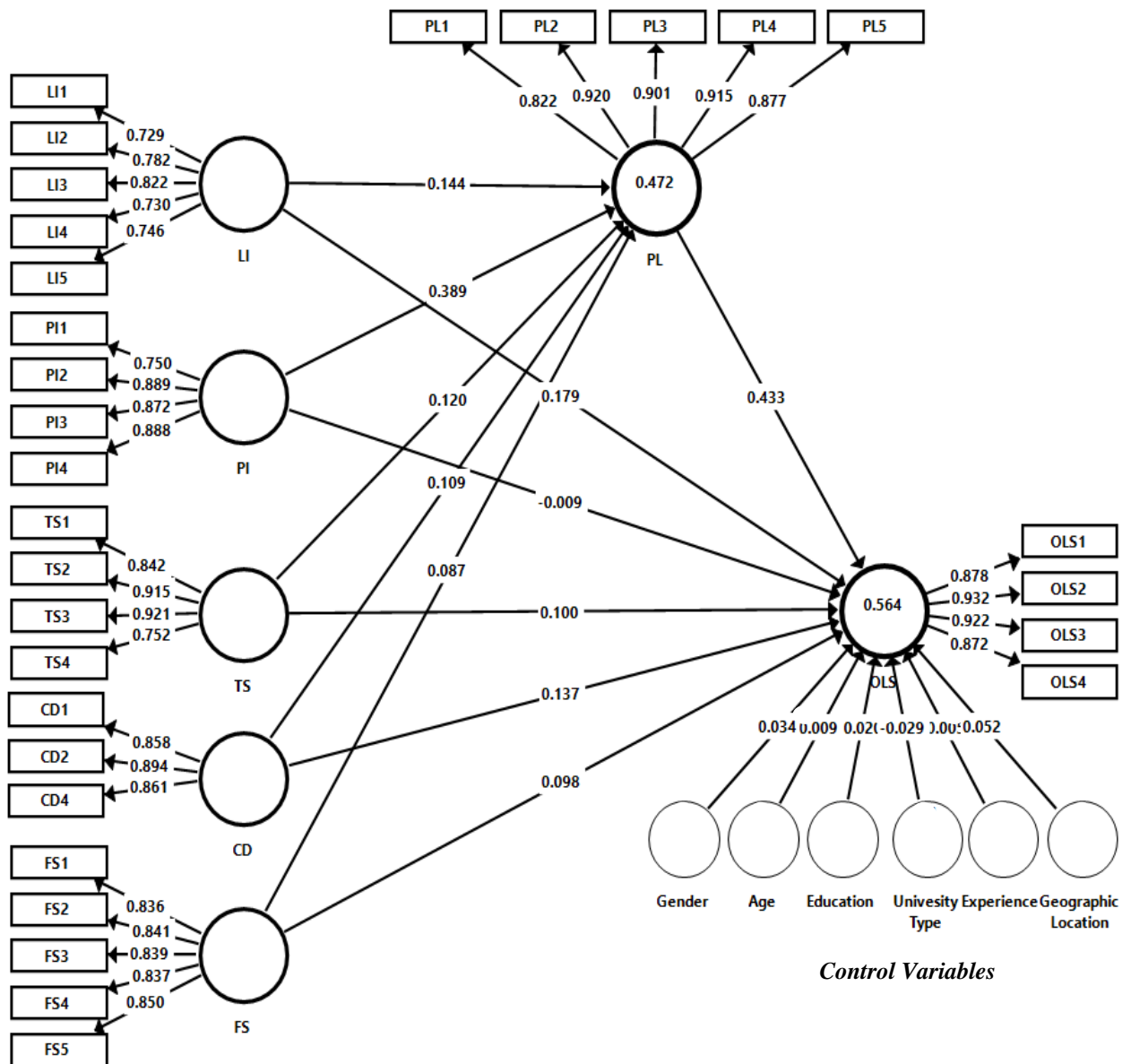


Figure 4.8 shows the path coefficient and R^2 value of the structural model developed. As illustrated in figure 4.8, R^2 -value depicts the predictive power of the model, as it denotes the amount of explained variance of the endogenous construct in the model (Hair et al., 2017). The figure shows the weak predictive power of Perceived Learning (PL) which has an R^2 value of 0.472. It indicates that 47.2% variation in perceived learning is explained by the independent variable. Likewise, path analysis shows the moderate predictive power of Online Learning Satisfaction with an R^2 value of 56.4% indicating approximately 56.4% of the variance of Learning Satisfaction is explained by the model.

Table 4.20

Path Coefficient

	Original Sample (O)	Sample Mean (M)	S.D	T- Statistics	P- Values
LI -> PL	0.144	0.145	0.054	2.674	.004**
LI -> OLS	0.179	0.179	0.059	3.027	.001**
PI -> PL	0.389	0.387	0.06	6.527	.000**
PI -> OLS	-0.009	-0.009	0.052	0.176	.430
TS -> PL	0.12	0.122	0.057	2.111	.017*
TS -> OLS	0.10	0.102	0.058	1.733	.042*
CD -> PL	0.109	0.109	0.06	1.808	.035*
CD -> OLS	0.137	0.138	0.059	2.307	.011*
FS -> PL	0.087	0.086	0.06	1.458	.072
FS -> OLS	0.098	0.097	0.053	1.846	.032*
PL -> OLS	0.433	0.431	0.055	7.881	.000**
Gender -> OLS	0.034	0.033	0.037	0.91	.181
Age -> OLS	0.009	0.009	0.035	0.243	.404
Education Level-> OLS	-0.02	-0.019	0.04	0.499	.309
University Type -> OLS	-0.029	-0.028	0.037	0.79	.215
Experience -> OLS	-0.005	-0.005	0.033	0.147	.442
Geographic Location -> OLS	0.052	0.051	0.038	1.394	.082

Table 4.20 shows that all the independent variables have a significant impact on perceived learning (P-value > 0.05) except Faculty Support. Faculty Support has no significant impact on Perceived Learning. Similarly, all the independent variables have a significant impact on Online Learning Satisfaction except Peer Interaction. Thus, Peer Interaction has no significant impact on Learning Satisfaction. Regarding the control variables, all the control variables Gender, Age, Education Level, University Type, Experience, and Geographic Location have no significant impact on Online Learning Satisfaction.

4.8 Mediation Effect

In presence of a third mediator variable between other two related constructs mediation occurs. Any change in an exogenous variable causes a change mediator, which further causes a change in the endogenous construct in PLS structural model. Thus, a mediator variable impacts the underlying relationship between the independent variable and dependent variable. In this study, mediation analysis is carried out using SmartPLS V3.

4.8.1 Mediation effect of PL on the relation between LI and OLS

Table 4.21

Mediation Analysis of PL on the relation between LI and OLS

Total Effect		Direct Effect		Indirect Effect of PI on OLS					
(PI->OLS)		(PI->OLS)							
β	P-Value	β	P-Value	β	SD	T-Value	P-Value	BI [5%; 95%]	
H: LI->PL->OLS									
.241	.000	.179	.002	.062	.025	2.496	.006	.026; .107	

Table 4.21 exhibits the direct effect, indirect effect, and total effect of the Learner-interface interaction on Online Learning Satisfaction. The results revealed that the total effect of LI on OLS is significant ($\beta=.241$, $t=3.929$, $P=.000$). With the inclusion of mediating variable (PL), the impact of LI on OLS is significant ($\beta=.179$, $t=2.966$, $P=.002$). The indirect effect of LI on OLS through PL is found significant ($\beta=.062$, $t=2.496$, $P=.006$). Both direct and indirect effects are significant with the inclusion of a mediating variable. This shows that the

relationship is partially mediated by LI. Direct effect and Indirect effect both point in the same direction. Thus, there is a complementary partial mediation.

4.8.2 Mediation effect of PL on the relation between PI and OLS

Table 4.22

Total Effect, Direct Effect, and Indirect Effect of PI on OLS

Total Effect (PI->OLS)		Direct Effect (PI->OLS)		Indirect Effect of PI on OLS						
β	P-value	β	P-Value	β	SD	T Value	P Value	BI [5%; 95%]		
.159	.004	-.009	.430	H: PI->PL->OLS		.168	.034	4.887	.000	.117; .233

Table 4.21 exhibits the total effect, direct effect, and indirect effect of Peer Interaction on Online Learning Satisfaction. The results revealed that the total effect of PI on OLS is significant ($\beta=0.159$, $t=2.668$, $P=0.004$). With the inclusion of mediating variable (PL), the direct impact of PI on OLS becomes insignificant ($\beta=-0.009$, $t=0.175$, $P=0.430$). The indirect effect of PI on OLS through PL is found significant ($\beta=0.168$, $t=4.887$, $P=0.00$). The indirect effect is significant whereas the direct effect is insignificant. This shows that the relationship is fully mediated by PL.

4.8.3 Mediation effect of PL on the relation between CD and OLS

Table 4.23

Mediation Analysis of PL on the relation between CD and OLS

Total Effect (CD->OLS)		Direct Effect (CD->OLS)		Indirect Effect of CD on OLS						
β	P-value	β	P-Value	β	SD	T Value	P Value	BI [5%; 95%]		
.184	.003	.137	.011	H: CD->PL->OLS		.047	.026	1.846	.032	.007; .092

Mediation analysis is performed to evaluate the mediating role of Perceived Learning on the association between CD and OLS. The results (see Table 4.23) revealed a significant indirect effect of CD on OLS ($\beta =0.047$, $t=1.846$, $p <.032$). The total effect of CD on OLS is

significant ($\beta = 0.184$, $t = 2.729$, $p < .003$), with the inclusion of the mediator the effect of CD on OLS is still significant ($\beta = 0.137$, $t = 2.285$, $p < .011$). Among direct and indirect effects, the only indirect effect is significant. Hence, this shows that Perceived Learning (PL) partially mediates the relationship between CD and OLS.

4.8.4 Mediation effect of PL on the relation between TS and OLS

Table 4.24

Mediation Analysis of PL on the relation between TS and OLS

Total Effect (TS->OLS)		Direct Effect (TS->OLS)		Indirect Effect of TS on OLS					
β	P-value	β	P-Value	β	SD	T Value	P Value	BI [5%; 95%]	
H: TS->PL->OLS									
0.152	.009	.100	.041	.052	.025	2.082	.019	.014; .096	

Table 4.22 exhibits the total effect, direct effect, and indirect effect of Teacher-Student Interaction on Online Learning Satisfaction. The results revealed that the total effect of TS on OLS is significant ($\beta=0.152$, $t=2.351$, $P=0.009$). With the inclusion of mediating variable (PL), the impact of PI on OLS becomes significant ($\beta=0.10$, $t=1.739$, $P=0.041$). The indirect effect of TS on OLS through PL is found significant ($\beta=0.052$, $t=2.082$, $P=0.019$). This shows that the relationship is partially mediated by PL.

4.8.5 Mediation effect of PL on the relation between FS and OLS

Table 4.25

Mediation Analysis of PL on the relation between FS and OLS

Total Effect (FS->OLS)		Direct Effect (FS->OLS)		Indirect Effect of FS on OLS					
β	P-value	β	P-Value	β	SD	T Value	P Value	BI [5%; 95%]	
H: FS->PL->OLS									
.135	.013	.098	.034	.038	.026	1.461	.072	-.003; .083	

Mediation analysis is performed to assess the mediating role of Perceived Learning on the relationship between Faculty Support (FS) and Online Learning Satisfaction (OLS). The results (see Table 4.24) reveals a non-significant indirect effect of FS on OLS ($\beta = 0.038$, $t=1.461$, $p < .072$). The total effect of FS on OLS is significant ($\beta = 0.135$, $t = 2.222$, $p < .013$), with the inclusion of the mediator the effect of FS on OLS is still significant ($\beta = 0.098$, $t = 1.822$, $p < .034$). This shows that Perceived Learning (PL) doesn't mediate the relationship between FS and OLS. This indicates there is a presence of the direct, non-mediating effect.

4.9 Hypothesis Testing Summary

Table 4.26

Result of Hypothesis Testing

Hypothesis	Path Coefficient	P Value	Hypothesis Support
H1a: LI ->PL	0.144**	0.004	Yes
H1b: LI ->OLS	0.179**	0.001	Yes
H2a: PI ->PL	0.389**	0.000	Yes
H2b: PI ->OLS	-0.009	0.430	No
H3a: TS ->PL	0.120*	0.017	Yes
H3b: TS ->OLS	0.100*	0.042	Yes
H4a: CD->PL	0.109*	0.035	Yes
H4b: CD ->OLS	0.137*	0.011	Yes
H5a: FS ->PL	0.087	0.072	No
H5b: FS ->OLS	0.098*	0.032	Yes
H6: PL -> OLS	0.433**	0.000	Yes
H7: LI -> PL -> OLS	0.062**	0.006	Yes
H8: PI -> PL -> OLS	0.168**	0.000	Yes
H9: TS -> PL -> OLS	0.052*	0.020	Yes
H10: CD -> PL -> OLS	0.047*	0.032	Yes
H11: FS -> PL -> OLS	0.038	0.075	No

** Hypothesis is significant at the 0.01 level, * Hypothesis is significant at the 0.05 level

Table 4.26 exhibits results for hypothesis testing. Learner-interface interaction revealed significant positive relationship with perceived learning ($\beta=0.144$, $p= 0.004$) and online learning satisfaction ($\beta=0.179$, $p= 0.001$). Thus, Hypothesis 1a and Hypothesis 1b are

supported. Peer interaction demonstrated significant positive relation with perceived learning ($\beta=0.389$, $p= 0.000$) supporting Hypothesis 2a but no significant relationship ($\beta= -.009$, $p= 0.430$) with online learning satisfaction rejecting Hypothesis 2b. Teacher-Student Interaction is found to have significant positive influence with both perceived learning ($\beta=0.120$, $p= 0.017$) and online learning satisfaction ($\beta= 0.1$, $p= .042$). Hence, Hypothesis 3a and 3b both are supported. Similarly, Course design is found to have a significant positive relationship with perceived learning ($\beta=0.109$, $p= 0.035$) and learning satisfaction ($\beta=.137$, $p= 0.011$). Thus Hypothesis 4a and 4b are supported. Likewise faculty/university support has demonstrated significant positive impact on learning satisfaction ($\beta= .098$, $p= 0.032$) but no significant relation with perceived learning ($\beta=0.087$, $p= 0.072$). Thus Hypothesis 5a is rejected whereas 5b is supported. Thus the result supports Hypothesis 1, Hypothesis 3, Hypothesis 4, Hypothesis 5, and rejects Hypothesis 2.

Similarly, Perceived learning is found to have a significant positive impact on the relationship with online learning satisfaction ($\beta= 0.433$, $p= 0.0$). Hence, accept Hypothesis 6. Perceived learning revealed a significant mediating effect in the relationship between learner interface and online learning satisfaction ($\beta= .062$, $p= 0.006$). Hence, Hypothesis 7 is supported. Next, Perceived learning has demonstrated a full mediating effect on the relation between peer interaction and online learning satisfaction ($\beta= .168$, $p= 0.00$) fully supporting Hypothesis 8. Similarly, perceived learning is found to have significant mediating effects on the relationship between teacher-student interaction and online learning satisfaction as well as course design and online learning satisfaction. Thus Hypothesis 9, and Hypothesis 10 are supported whereas Hypothesis 11 is not supported. Perceived learning revealed no significant mediating effect in the relationship between faculty/university support and online learning satisfaction.

4.10 Major Findings

The key findings are summarized.

- ❖ The research was conducted among students who were taking online classes due to the shutdown of college during the pandemic. Among 384 respondents, 56.25 percent of them were male whereas 43.75 percent of them were female indicating male dominance.

- ❖ The majority of students belong to the 21-25 years age group. More than half of the total respondents (51.56 percent) belong to this group. It is followed by respondents of the 26-30 years age group which consists of more than one-third of the total respondents. In the third, 16-20 years age group students make up 10.42 percent of total respondents of the study. Hence, there is a high dominance of youths from 21-25 years of age in this survey.
- ❖ In the category of education level, 60.90 percent of the total students are pursuing a master's degree in management whereas the remaining 38.10 percent of them are pursuing a bachelor's in management education. Among 384 students 73.7 percent are studying in public universities whereas the remaining 26.3 percent of these students are studying in private universities. Hence, Public university students dominate this study survey.
- ❖ In the categorization of experience, 49.48 percent of respondents have no prior experience with online classes before the pandemic. Only 27.86 percent of students have little experience with online learning before the pandemic. Only 22.66 percent of respondents have enough experience with online learning and online classes before COVID-19. Hence, inexperienced students dominate this study survey.
- ❖ Among 364 students, 78.13 percent of respondents take online classes from urban areas. Whereas 21.88 percent take online classes in rural areas. Hence urban area students have major dominance in this study survey. Among 384 respondents, 38.28 percent of students use both smart phone and laptops to take their online classes. 27.08 percent of respondents take the online class using a laptop only whereas 25.26 percent of students take their online class using smartphones only. Students using the laptop and smart phone are dominant in this study survey.
- ❖ In the category of internet facilities at home, 63.54 percent of students have regular Wi-Fi at home to connect to online classes. 14.84 percent connect to online classes using mobile data. 21.09 percent of respondents use both regular Wi-Fi and mobile data to attend online classes. Thus, it is clear that Wi-Fi user dominates this study survey.
- ❖ Among 384 students, 19.27 percent use Zoom as a video conferencing platform for online classes. 25 percent of students use Microsoft Teams and only 5.73 percent of

students use Google Meet or Google Classroom. 27.34 percent of students have Zoom and Microsoft Teams both as video conferencing apps. Hence, Zoom and Microsoft Teams users dominate this study survey.

- ❖ The overall mean score of Learner-interface interaction is 4.177 (SD=1.313) which shows that students had positive interactions with the learning interface frequently in online classes during the pandemic. The overall mean score of Peer Interaction is 3.342 (SD = 1.513) which indicates that students agree that peer interaction was less frequent and was not effective to improve learning in online classes during the pandemic. The overall mean score of Teacher-Student Interaction is 3.702 (SD=1.520) which indicates average students' agreement that their interactions with the teachers in online classes were less frequent and less effective in the online setting than in physical classes.
- ❖ The mean scale of Course Design is 4.05 with a standard deviation of 1.51. It indicates that average respondents agree that their faculty was able to assist them with appropriate course structure in their online classes during the pandemic. The mean scale of Faculty/University Support is 4.33 with a standard deviation of 1.52. It indicates that in their online classes, their university was able to provide technological and other support during the pandemic online classes.
- ❖ There is a positive significant direct impact of learner-interface interaction on Online Learning Satisfaction. Learner interface has a moderately strong correlation ($r=.547$) with Learning Satisfaction. It indicates that with an increase in learner-interface interaction, the learning satisfaction of online class students increases. Peer Interaction, Teacher Student Interaction, Course Design and Faculty Support have moderately strong correlation ($r=0.547$, $r=0.534$, $r=0.541$, and $r=0.503$ respectively). This suggests that any change in PI, TS, CD, and FS leads to a significant positive change in OLS. Perceived Learning has a strong correlation ($r=0.685$) with learning satisfaction. It means that statistically, any positive change in perceived learning causes a complimentary change in learning satisfaction.
- ❖ Perceived Learning fully mediates the relationship between Peer Interaction and Online Learning Satisfaction. It means that the effect of PI on OLS is completely transmitted with help of Perceived Learning. Perceived learning partially mediates the relation between Learner-interface interaction and Online Learning Satisfaction.

This suggests that a portion of the effect of LI on OLS is mediated through Perceived Learning, while the Learner interface still explains a portion of Learning Satisfaction that is independent of Perceived Learning. Perceived learning partially mediates the relation between Teacher-Student interaction and Online Learning Satisfaction. This indicates that some of the effects of TS are mediated through PL whereas the other portion has a direct impact on OLS. Perceived learning partially mediates the relation between Course Design and Online Learning Satisfaction. This means that a component of CD's influence on OLS is mediated by PL, but CD still explains a portion of OLS that is not mediated by the mediating variable, PL. Perceived Learning (PL) doesn't mediate the relationship between FS and OLS. This indicates there is a presence of the direct, non-mediating effect of FS on OLS.

CHAPTER V

DISCUSSION, CONCLUSION, AND IMPLICATION

This chapter comprises the concluding part of the research. This chapter reviews the discussion, conclusion, and implication of the study. The entire study has been briefly summarized here and the main conclusions of this research have been made. Possible implications have been proposed in the subject area based on the previous scholars' evidence on the related factors of the research.

5.1 Discussion

The first research question addresses the effect of Interaction and University Effort on Perceived Learning. For this, five hypotheses were created which focused on the direct effects of learner-interface interaction, peer interaction, teacher-student interaction, course design, and faculty support on perceived learning during the COVID-19 pandemic. The second research question addresses the impact of Interaction and University efforts on Student Satisfaction in online learning during the pandemic. Further, five hypotheses were created to measure the effect of learner-interface interaction, peer interaction, teacher-student interaction, course design, and faculty support on learner satisfaction in online classes. Moreover, the direct effect of perceived learning on student satisfaction was measured. In the sequence of the research hypotheses, the hypothesis testing outcomes are analyzed and discussed. The third research question addressed the mediating effect of perceived learning on the relation between Interaction, University Effort, and Student Satisfaction in online classes during the COVID-19 pandemic.

Analysis of data reflected that there is a significant positive impact of learner-interface interaction on both perceived learning and learning satisfaction. Among three interactions under analysis, learner-interface interaction was found to be the strongest factor to predict online learning satisfaction. The result is consistent with Chejlyk, (2006) & Keeler, (2006) who found that compared to peer interaction and learner-instructor interaction, the amount of learners' interaction with the interface is more significant to student satisfaction in web-based learning. Wang (2003) showed that learner-interface interaction is one of the major dimensions that predict learning satisfaction in e-learning. Learners' interaction with course content is impacted mainly by content, its organization, layout, and ease of access. Students' motivation to study can be boosted by the introduction of media tools like interactive videos, which will promote student participation in the course content (Anderson, 2003; Havice,

Davis, Foxx, & Havice, 2010). The result is consistent with the results of the literature. It may be because for learning to occur, the student must interact with the process and content of the interface. Contents must be cognitively processed. Students must exercise easy control over what is learned. Hence, easier and friendlier interface interaction leads to greater perceived learning and greater user satisfaction.

When analyzing the impact of peer interaction on student satisfaction and perceived learning, peer interaction was found to have a strong positive influence on perceived learning. Peer interaction was revealed to be the best predictor of perceived learning among the three interactions studied. The result is consistent with findings of past literature (Baber, 2020; Fabry, 2009; Wan, Wang & Haggerty, 2008). Peer interaction was found to be an insignificant predictor of student satisfaction which is contrary to the study of Rodriguez Robles (2006) and Jung et al. (2002) where learner-learner interactions were found to have the most significant effect on student satisfaction in e-learning. This finding looks reasonable since in this study students had just shifted to online learning due to COVID-19. Therefore, the interaction between students and teachers had greatly reduced as compared to face-to-face learning. Because electronic communication is not always as loud, clear, or effective as traditional communication, students may well see interaction in online classrooms as a source of argument. The absence of emotions, facial expressions, and body languages in online interaction can make students perceive interaction not as effective as in physical classes.

When analyzing the relation of teacher-student interaction with perceived learning and student satisfaction, it was found that teacher-student interaction was a significant predictor of both perceived learning and learning satisfaction of the student. This result is consistent with the result of many works of literature (Alqurashi, 2019; Eom & Ashill, 2016; Arbaugh et al. 2007; Tsang et al., 2021) which observed that the relationship between the teacher and the learner was found to be a major determiner of student perceived learning and satisfaction. However, a great deal of empirical research has been done on e-learning in general (Schroder, & Belland, 2014; Arbaugh & Rau, 2007; Kuo, Walker; Wilson, 2007) specifically has found contradictory and inconsistent results on the effects of interaction and learning outcomes. This might be due to disparities in the assessments of the dependent variable and independent variables, issues of methodology, or a lack of a widely recognized conceptual model.

The current study confirmed that course design had a robust and positive significant association with both perceived learning and student satisfaction. It is consistent with

findings of the literature (Eom & Ashill, 2016; Gray & DiLoreto, 2016, Barbera, Clara, & Linder-Vanberschot, 2013; Ke & Xie 2009). One probable explanation is that many educational institutions employ a consistent course layout format during course design. As a result of such uniformity in the format of the online courses, students may consider course structure as an important part of improving their learning. When universities shifted to online courses, the students may believe that course structure is an incredibly significant part of improving their learning as it was in traditional learning.

The relationship between university support and perceived learning was non-significant. The analysis of university support in this study concentrated on the supply of clear rules, updates on the layout of virtual classes, and technical assistance. Learners may expect this type of help in both settings: in-person as well as online. Learners may not realize that this form of assistance can help them achieve better learning outcomes. The result is consistent with the result of Kuo et al. (2014), Rodriguez (2006), and Puzziferro (2008) which concluded that students did not view technical support as a crucial element that predicted learning outcomes and student initiative in online learning during COVID-19. However, university support was found to have a significant positive relation with student satisfaction in online learning during the pandemic. The result is consistent with past literature (Govindasamy, 2002; Selim, 2007; Chantanarungpak, 2010) which categorized University Support as one of the major critical success factors (CSF) in online distance learning.

Perceived learning was found to be a significant predictor of online learning. Perceived learning is an anticipatory factor of student happiness (Lohmann et al., 2019; Eom & Ashill, 2016; and Eagleton, 2015). The result is consistent with the findings of past literature (Tsang et al., 2021; Gray & DiLoreto, 2016; Richardson and Swan, 2003; Arbaugh and Duray, 2002) who found that the greater the perceived learning better will be the student satisfaction in online learning. The students perceive self-interaction with the interface, peer interaction, course design, and the role of the teachers or facilitators to be key elements of the constructive learning outcome. Furthermore, student satisfaction is influenced by favorable learning outcomes. The higher the perceived learning outcome in online learning during the pandemic, the greater will be the student satisfaction in online classes (Baber, 2020).

The study confirmed the partial mediating role of perceived learning in the relation between learner-interface interaction and student satisfaction in online learning. This indicates that students' perceived learning can partially explain why interface interaction positively affects online learning satisfaction. The result is consistent with the results of several past studies

(Bervell et al., 2020; Eom & Ashill, 2016). That is to say, university students who interact more with content are likely to develop more perceived learning (Keeler, 2006) which subsequently contributes to their satisfaction with online learning.

The study confirmed the complete mediating role of perceived learning on the relationship between peer interaction and learning satisfaction during online classes. This indicates that perceived learning fully explains why peer interaction affects student satisfaction during online learning. Very few studies have explored the mediating role of perceived learning between these variables in synchronous learning environments. However, the result is consistent with Lin, Wang & Lee (2022) which found a significant direct effect of peer interaction on perceived learning, and Mohamed and Lamia (2018) students who had a greater perceived influence on learning were more satisfied.

Further, perceived learning was found to partially mediate the relation between teacher-student interaction and online learning satisfaction. Similarly perceived learning was found to partially mediate the relation between course design and online learning satisfaction. That is, the positive effect of teacher-student interaction and course design is partially mediated by perceived learning. Very few research studies have explored the mediation effect of perceived learning. However, the results confirm that instructor interaction and faculty support are strong predictors of perceived learning (Tsang et al., 2021; Eom & Ashill, 2016, Alqurashi, 2019; Arbaugh et al. 2007), which in turn fosters learning satisfaction in students with online learning (Tsang et al., 2021; DiLoreto and Gray, 2016).

Our study confirmed that perceived learning did not mediate the relation between faculty support and learning satisfaction. The direct effect of faculty support was significant and greater than its indirect effect on learning satisfaction. This indicates that perceived learning cannot explain why faculty support cannot explain the positive effect of faculty support on student satisfaction during online learning. However, the results are consistent with Tsang et al., 2021 which stated that university support had no significant relationship with perceived learning. During the transformation of learning from traditional face-to-face learning to online classes, the student body expects technical and instructional support from the university. Students may anticipate this level of support to be offered whether a course is taught face-to-face or online. Students may not believe this sort of assistance is capable of improving their academic performance (Tsang et al., 2021).

5.2 Conclusion

The purpose of this dissertation was to investigate the effect of learner-interface interaction, peer interaction, teacher-student interaction, course design, and faculty support on students' perceived learning and satisfaction with online learning during the COVID-19 Pandemic. Further, this thesis also aimed to discover how this relationship is mediated by perceived learning. Therefore, a survey was conducted among university students of management majors taking synchronous online classes during the COVID-19 pandemic. Due to the lack of research in the field of mediation effect of perceived learning on the relationship between critical success factors of online learning and student satisfaction, this study provides some interesting findings.

Among the five hypothesized factors to affect perceived student learning, all the three interactions (interface interaction, peer interaction, teacher-student interaction) and course design had a significant positive effect on perceived learning. This means that students perceive greater learning when there are greater interactions between friends, instructors, and content at online meetings. Moreover, course structure plays an important role to ensure the engagement of students in online courses, hence it plays a significant role in determining the student's perceived level of learning.

Among the five hypothesized factors to affect learning satisfaction, learner-interface interaction, teacher-student interaction, course design, and faculty support were found to positively affect student satisfaction in online learning during the pandemic. Among the three types of interaction (peer interaction, learner-content interaction, and teacher-student interaction) peer interaction was a poor predictor of students' learning satisfaction. This means that students feel satisfied with online learning when there is greater interaction with content and instructors rather than with peers. It suggests that designing a better course structure and providing better faculty support by the university plays a vital role in cumulating student satisfaction levels in online classes. Perceived learning was found to be one of the strongest predictors of online learning satisfaction during the pandemic.

Regarding the mediating effect, perceived learning appears to influence the majority of these direct relationships. The findings showed that perceived learning partially mediates the relation between learner-interface interaction, teacher-student interaction, and course design with online learning satisfaction. Whereas perceived learning was found to have a full mediating effect on the relationship between peer interaction and learning satisfaction on

online learning during the pandemic. Therefore, the overall pattern for the mediating effect on the suggested relationships between the CSFs and satisfaction variable shows that perceived learning is a strong predictor of student satisfaction in online learning. These findings provided the answers to the research questions of the dissertation. It was revealed that perceived learning also has a direct effect on student satisfaction with online learning.

5.3 Implications

The findings of the study provide several implications for university administrators, professors, academicians, and researchers on the design of online courses. This study can contribute to the current issues regarding students' perception of online learning and satisfaction in learning.

5.3.1 Managerial Implication

This study suggests that all three types of interaction (interface interaction, peer interaction, and teacher-student interaction) are critical factors for enhancing perceived learning. Among three interactions, learner-interface interaction and instructor interaction are two more important predictors of student satisfaction during online learning than peer interaction. Ritchie and Newby (1989) believe that learners must be made comfortable with the technology to facilitate and enhance interaction. There is a need to develop pedagogically user-friendly online course interfaces and management systems (Vonderwell & Zachariah, 2005). Hence administrators and professors should design content interface that is perceived as easy and effective for the student. Instructors should go beyond hosting a class. To enhance learner-interface interaction, students must be skilled in using the LMS so that learners can interact fully with content, peers, and instructors. Instructional activities and training should be provided to help the learner become comfortable which in turn enhances interaction. They should give time to address students' concerns and provide timely feedback. Teachers should lead a positive and constructive discussion in every online class. As a result, it is vital to suggest training and practical programs to teach online teachers how to teach online (Plante & Asselin, 2014).

Likewise, students value course design as a significant predictor of perceived learning and learning satisfaction. Faculty support from the administration plays a vital role in determining the student satisfaction level. This suggests that providing well-defined learning objectives, offering a consistent course structure, and communicating clear tasks or expectations are beneficial to students in an online setting. Rather, it would be wise for

faculty to create a comfortable environment for students. Administrators should design the online course so as to add to the perceived learning of the students as it is a strong predictor of learning satisfaction in online learning.

5.3.2 Implication of Researcher

This research contains a sample size of 384 only of university students pursuing management education in synchronous learning. The majority of respondents belong to Tribhuvan University and Kathmandu University. More robust findings might occur by including students from various colleges (e.g. public, private, vocational) pursuing different streams (e.g. management, science, humanities). Apart from this, this study uses only five variables as critical success factors of online learning. The future study may contain more items that can better measure the social identity construct and incorporate more variables in the study to improve the model.

This study has employed perceived learning only as mediating variable. Future research should include other variables (student initiative, and academic self-efficacy) to widen the scope of research. Finally, one of the findings of this study is that perceived learning does not mediate the relation between faculty support and learning satisfaction indicating only the direct impact of faculty support on student satisfaction. Future research should investigate the effect of faculty support in presence of other mediating variables.

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APPENDIX

Questionnaire

Section A: Socio-Demographic Characteristics

1) Gender

- 1- Male
- 2- Female

2) Age

- 1- 16- 20
- 2- 21-25
- 3- 26-30
- 4- 31 & above

3) Education Level

- 1- Bachelor
- 2- Master

4) University

- 1- Public University
- 2- Private University

5) Previous Experience in Online Learning Before Pandemic

- 1- None
- 2- Little
- 3- Enough

6) Geographical Location of Students during the online classes

- 1- Urban
- 2- Rural

7) Devices used for Online Classes

- 1- Smart Phone
- 2- Laptop
- 3- Desktop PC
- 4- Tablet/iPad

8) Internet access at home

- 1- Regular Wi-Fi
- 2- Mobile Data
- 3- Others [.....]

9) Online Learning Platform used for Online Classes

- 1- Zoom

- 2- Microsoft Teams
- 3- Google Classroom/Google Meet
- 4- Others [.....]

Section B: Dimension of Interactions

Rate the questions given below on a scale from 1 to 7. Every item is measured by 7- point Likert Scale. They are: 1= Strongly Disagree; 2=Disagree; 3= Somewhat Disagree, 4= Neither Agree nor Disagree, 5=Somewhat Agree; 6= Agree; 7= Strongly Agree.

Q.10 Learner-interface interaction

Rate the questions provided below on a scale from 1 (Strong Disagreement) to 7 (Strong Agreement).

S.N	Items	1	2	3	4	5	6	7
1	I found the learning management system simple to use.							
2	I found the online learning system user-friendly.							
3	I easily understood the course content from the learning system.							
4	I had no issues of disconnectedness, separation, and distractions during online classes.							
5	I found the system easy to search and find the information needed.							

Q.11 Peer Interaction

Rate the questions provided below on a scale from 1 (Strong Disagreement) to 7 (Strong Agreement).

S.N	Items	1	2	3	4	5	6	7
1	I had frequent positive peer interactions.							
2	Peer interaction level was normally high in the online classes.							
3	In online classes, I learned more from my classmates than in traditional classes.							
4	Peer interaction helped to improve the quality of learning in online classes.							

Q.12 Teacher-Student Interaction

Rate the questions provided below on a scale from 1 (Strong Disagreement) to 7 (Strong Agreement).

S.N	Items	1	2	3	4	5	6	7
1	I had frequent positive interactions with teachers.							
2	There were high-level teacher-student Interactions.							
3	In online classes, the interaction between teachers and students helped me in boosting the quality of my learning.							
4	I found teacher-student Interaction a very important learning tool.							
5	Teachers provided prompt feedback on projects, assignments, and tests in online classes.							

Section C: Dimension of University Effort

Q.13 Course Design

Rate the questions provided below on a scale from 1 (Strong Disagreement) to 7 (Strong Agreement).

S.N	Items	1	2	3	4	5	6	7
1	Before the session, the course objectives and procedures were well communicated.							
2	Class modules were logically organized in an understandable manner.							
3	During online classes, academic workload (assignments, quizzes, seminar papers, etc.) increased compared to physical classes before the pandemic							
4	The online course materials were typically intriguing, and engaging, and piqued my interest in learning.							
5	In general, I found course materials in online classes challenging.							

Q.14 Faculty/University Support

Rate the questions provided below on a scale from 1 (Strong Disagreement) to 7 (Strong Agreement).

S.N	Items	1	2	3	4	5	6	7
1	Clear instruction and guidelines were provided by University before online classes.							
2	My university kept me up to date and well-informed about the scheduling of classes.							
3	The University could provide me with immediate technological assistance.							
4	University provided an adjusted syllabus and exams.							
5	The university made every effort to ensure the smooth running of virtual classes.							

Section D: Mediating and Dependent Variables

Q.15 Perceived Learning

Rate the questions provided below on a scale from 1 (Strong Disagreement) to 7 (Strong Agreement).

S.N	Perceived Learning	1	2	3	4	5	6	7
1	Online classes have the same academic quality as traditional classes.							
2	I learned just as much in online classes as I did in actual ones.							
3	Comparatively, I learned more in e-classes than in physical classes.							
4	There was a better quality of learning experience in virtual classes.							
5	My productivity increased during online classes.							

Q.16 Online Learning Satisfaction

Rate the questions provided below on a scale from 1 (Strong Disagreement) to 7 (Strong Agreement).

S.N	Online Learning Satisfaction (OLS)	1	2	3	4	5	6	7
1	I would take Online Classes again in the future.							
2	I would recommend Online Classes to others.							
3	I was satisfied with online learning overall.							
4	As a whole, Online Classes were Successful.							

PERCEIVED LEARNING AND SATISFACTION WITH ONLINE LEARNING AMONG MANAGEMENT STUDENTS DURING COVID-19 PANDEMIC

ORIGINALITY REPORT

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PRIMARY SOURCES

1	www.mdpi.com Internet	153 words — 1%
2	Ahmed Bossman, Samuel Kwaku Agyei. "Technology and instructor dimensions, e-learning satisfaction, and academic performance of distance students in Ghana", Heliyon, 2022 Crossref	120 words — 1%
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