RESEARCH ARTICLE

Students Perception Regarding Online Learning During the Covid-19 Pandemic

M.N. Mayuri [1], D Rahul Krishna [2], Sindhu Ravichandran [3], S Rashmi [4]

Abstract

With the abrupt change across the globe spurred on by the novel coronavirus, online learning has emerged as a potential alternative for the worldwide education sector. Prior to COVID-19, amidst the surge in popularity of online learning with the advent of the internet and technological advances, students preferred conventional face-to-face learning over online learning. The objective of this research was to see how students perceived online learning during the COVID-19 epidemic. Out of the 105 responses obtained through an online survey, we were able to establish a significant association between demographical characteristics with the factors of student perception with the use of Chi-Square analysis. We used Correlation and Regression analysis to see how the independent factors of Online experience, interaction, learning design, tools and technology, social presence, and attitude related to the dependent variable of Student Perception. The findings revealed that interaction was highly correlated with students' perceptions and that it was also the most essential element among the others.

Author Affiliation: [1,2,3] Department of Industrial Engineering and Management, JSS Campus, JSS Academy of Technical Education, Dr. Vishnuvardhan Road, Mylasandra post, Bangalore – 560060, Visvesvaraya Technological University, Belagavi, Karnataka, India.
[4] Assistant Professor, Department of Industrial Engineering and Management, JSS Campus, JSS Academy of Technical Education, Dr. Vishnuvardhan Road, Mylasandra post, Bangalore – 560060, Visvesvaraya Technological University, Belagavi, Karnataka, India.
Corresponding Author: M.N. Mayuri. Department of Industrial Engineering and Management, JSS Campus, JSS Academy of Technical Education, Dr. Vishnuvardhan Road, Mylasandra post, Bangalore – 560060, Visvesvaraya Technological University, Belagavi, Karnataka, India.
Email: mayurimn15@gmail.com, rashmis@jssateb.ac.in

1. Introduction

Due to the crisis, the globe is experiencing as a result of the COVID-19 epidemic, the digitization of the teaching-learning process has escalated significantly. Social distancing and working at home are the latest affirmations, and the lot of nations abide to them avidly. This is also true in the education sector due to such closures in the educational process institutes have turned to a "totally online" methodology. instructing students, on the one hand, online education is convenient. A knowledge recommendation system is available on online learning platforms. When students search for a specific course, the system will automatically suggest similar courses so that they have more personalized options. The present online learning process is an unplanned system that requires learners to know technology and apply it effectively. On the other side, some students live in remote places, including mountainous areas, with limited infrastructure and other supporting capacities, widening the digital divide even further. More accessibility, access to goods irrespective of place or time, and expense and pollution cutbacks, such as carbon emissions from reduced commuting, are all major benefits noteworthy. Online classes have their own set of constraints, including issues with internet access, poor internet connection quality, and lack of digital skills. Some advantages, like time flexibility, might also be a drawback, particularly for students with limited time. The advantage of this online learning is that it will serve as a reference as well as an evaluation tool for readers, allowing them to quickly

find solutions to problems that students may have while using this online learning system. So that online learning can become even better in the future and maximum learning outcomes can be obtained Saifuddin, (2017).

1.1. Impact of COVID-19 on the education system

People in Wuhan visited local hospitals in December 2019 with a severe respiratory condition for an unexplained reason. The respiratory swab tests from patients were forwarded to standard laboratories to investigate the cause. China alerted the World Health Organization of the epidemic on December 31st, 2019, and Huanan seafood markets were shut on January 1st, 2020. The virus was discovered as a coronavirus on January 7th, with 95 percent similarity with coronary bat virus and 70 percent resemblance to SARS-CoV. The coronavirus disease (COVID-19) is an extremely infectious and deadly viral condition caused by the acute respiratory distress syndrome coronavirus (SARS-CoV-2) and has since spread worldwide.

The COVID-19 pandemic posed a danger to all operations around the globe. The National Education system, which comprised schools, colleges, and universities, was among the systems that encountered a challenging scenario. Several governments had compelled universities to stop offering face-to-face teaching to the majority of their students, ordering them to transition to online teaching and virtual education very instantly. During the shift, both students and teachers encountered multiple challenges.

Since most authorities were trying to stunt COVID-19's accelerated growth, institutions had almost no time to plan for a virtual regime Daniel. Several countries, including India, were forced to shut down their schools and institutions, potentially causing complications for students and faculty members. During this abrupt switch, issues such as a lack of resources such as computers and laptops, a poor internet connection, and many others surfaced. Since social distancing is so needed at this point, learning chances will suffer greatly. Academic institutions are still scrambling to develop solutions to this difficult scenario. Such circumstances emphasize the importance of situation management for academic institutions Rieley. During this time of crisis, online classes were the only way to continue one's education. Zoom, Google Meet, Microsoft Teams, Skype, Google Classroom, and other similar apps aided and abetted in the continuation of learning. Throughout this time, there was an increase in demand for these applications. Some students and teachers were able to quickly adapt to the transition, but those who lacked the resources or prior exposure to these applications found it difficult. In general, it ended up taking many students and faculty from weeks to months to adapt to the changing situation.

1.2. Online Learning

Online education has become more accessible thanks to technical innovations. McBrien. Most terminology, such as online learning, e-learning, web-based learning, and virtual classrooms, generally offer the opportunity to learn from just about anywhere, at any moment, and with any technology with the use of a laptop or computer which is connected to a network Cojocariu. Online learning can be considered as a tool that can improve the teaching and learning process by making it more student-centred and innovative. Online learning is defined as an educational experience in simultaneous or asynchronous situations using different technologies with internet service (e.g., mobile phones, laptops, etc.). Learners could be anywhere in these environments to learn and interact with instructors and other students Singh. Students attend live lectures, educators and learners communicate in real-time, and there is the possibility of quick feedback in a contemporaneous educational setting, however, asynchronous learning environments are not well-designed Littlefield. Synchronous learning can provide a plethora of social engagement opportunities McBrien (2009).

1.3. Students' perception towards online learning

Perception is the process of recognizing and understanding the environment, which encompasses objects, people, symbols, and signs. Meanwhile, as per, Baity, perception is an individual's initial process of processing sensory perceptions to give meaning to their surroundings. This highlights that perception is a person's reaction to the information they receive from their surroundings, but that perception is likely to differ from reality. When it comes to online classes, students' perceived them to be of poor quality. Technological concerns, an absence of organization, interruptions in the rhythm of lectures, challenges in resolving queries, and a lack of passion and willingness to attend classes have been some of the main determinants limiting the efficacy of online classes Nambiar, Cosmina, conducted a

study perception on e-learning, outcomes from this paper show that it's clear that students are aware of the changes brought about by digital technologies, as evidenced by their impact on the learning process. It is also clear that students are well-equipped to use technology informal settings and are already utilizing these technologies to support their learning process.

With this background the present study aims to understand the students' perception regarding online learning during the COVID-19 pandemic. Hence, it is very much needed to gain insights about students' perception, so a review of literature regarding the same is conducted. 16

2. Literature Review

Sarkar, surveyed the students of a Public University of Bangladesh about their perceptions regarding online classes due to the pandemic. Results showed that most students faced challenges in online schooling, and the majority of the students preferred conventional types of learning to virtual classes and did not understand the content of virtual classes easily. The study also explored that most students did not feel comfortable in online classes. Still, considering the present pandemic situation, they decided to participate in the online class. Broadband/Wi-Fi users have more positive perceptions of online education. the study discovered that female students showed a better view than male students regarding online classes, and urban students have more positive appreciation than rural students. Agricultural students' perception and preference towards online learning were obtained through an online survey of 307 students conducted by Muthuprasad the results indicated that the majority of the respondents (70%) are ready to opt for online classes to manage the curriculum during this pandemic. The majority of the students preferred to use a smartphone for online learning.

Bączek conducted a survey on students' perception of e-learning, results showed that E-learning is an effective method of increasing knowledge that is widely accepted. However, it is critical to focus not only on expanding knowledge but also on clinical and social skills. E-learning should not only focus on the delivery of content, but also on the ability of students to interact with the materials and receive feedback. Implementing online learning into the curriculum successfully necessitates a well-thought-out strategy as well as a more active approach.

In a survey conducted by Peimani, the results indicated that students concerning blended online modes of delivery are both rare and much needed, particularly amid the higher education sector's adaptation. Following the study's significant findings, discussions regarding eye contact and nonverbal communication in a virtual learning experience, as well as the rights of learners and educators to see and be seen, can be explored further in future research on blended online course designs. Zaveri conducted a study on the Efficiency of Online Learning with the help of conventional sampling methods analysis and the results from this analysis are discussing some of the elements that could be used to improve the experiences gained through e-learning. Based on the expected benefits of e-learning, the fact that there is a significant association between increased learning efficiency and increased performance and that

e-learning makes very good use of innovative concepts and platforms is inadequate.

Diana, conducted studies on Students' perception of using eLearning technologies tools results indicated that, students are profoundly aware of the changes brought about by digital technology, as well as their impact on the learning process. Hami conducted studies on online learning for visual impairment students' perception during the COVID-19 epidemic, students with visual impairments have a good attitude toward online learning. Online learning according to a Visual Impairment student, is particularly useful in pandemics, though not efficient.

Maison conducted studies on perception, the findings of the study reveal that students' perceptions and attitudes toward integrating online learning, particularly executing their activities online as a result of the COVID-19 pandemic, are positive. Online tasks during the pandemic study were conducted and thorough analysis from students found out that according to statistics, 70.5 percent of students are aware of online assignments because of their perceptions and attitudes. Anatomy classes were taken in zoom platform during the pandemic author Klein, the results of this study are students were pleasantly favorable about online learning as a replacement for the traditional gross anatomy laboratory. The majority of students thought that it gave valuable views, enhanced understanding of anatomy, and aided in the application of anatomical information as a visual learning resource. Moving from in-person paper-based assessment to an online environment, with restrictions on invigilation and students' greater difficulties labelling responses with a computer keyboard, makes comparing cohorts harder. Solanki, conducted an online survey for Indian students about their perception of online learning survey was conducted, results of this analysis discovered that there was both a positive and negative impact. This demonstrates that how children feel or what they are going through during the lockdown must be worked out in various sections of the paper, and teachers and the educational system must be sensitive.

With careful observations made from the literature review, we have successfully identified six factors of students' perception regarding the online classes during the COVID-19 pandemic. They are shown in the Figure 1.

3. Operational definitions
• Online Experience
The use of atmospheric cues in digital platforms, as well as user interaction between students and faculty and among students, all combine to form a virtual experience is called online experience(Novak, et al., 2000) .According to Shraim, students' perceptions of online learning have more advantages over paper-based evaluations in aspects of judging technique stability, time efficiency, and expenses, whereas Almomani, believe that students were displeased with the terms of quantity and quality of their virtual education encounter in their research. According to a recent cross-sectional study conducted in the Philippines by Baloran, the majority of students had negative perceptions and disapproved of the Online-Blended Learning Method used at their universities during the COVID-19 pandemic.

• Interaction

Interactions are mutual occurrences in which at least two elements and two actions are needed. Interactions occur when these objects of interest engage each other. An educational interaction takes place when a student reacts with the surroundings in which he or she is learning. According to Baber interaction in an online class, combined with learning outcomes, has a significant influence on students' perceptions of learning. Interaction, encouragement, core curriculum, and the lecturer's role are always seen as critical influences of a positive educational outcome by students. Interaction, as per Ku, is a significant element for perceived student achievement in online classes. According to Howland, the most essential issue in "overall satisfaction" and "learning outcomes" is instructor-learner interaction. Learner-content and learner-instructor interactions are very vital for student perceived education and fulfillment, according to Alqurashi, but learner-learner interaction is not as significant.

• Learning Design
The structure that facilitates learning experiences is known as Learning Design. It refers to decision making about what to teach, when to teach it, where to teach it.Choices must be taken concerning the course's content, structure, timing, sequence of learning activities, type and frequency of assessment, and the nature of technology used to support learning.The rapid growth of technology in various areas has created a huge demand for educational institutions during this pandemic situation virtual classroom could be the best option for facilitating this distance learning. Setting clear goals for their subjects, building time management methods, arranging their environment for productivity, designing task strategies, and accepting the self-consequences of their actions are all examples of self-regulation approaches to learning. The goal of feedback is to close the gap between understanding and performance, as well as the desired outcome Hattie, One of the most effective ways to give engaging and interactive online lectures and lessons is through webinars. To make webinars effective, instructors must create explicit learning objectives for each session, utilising higher-order thinking verbs, and match them with learning activities and assessments.

• Tools and Technology
A tool is a specific, tangible object, such as a pattern or official portal, that is used to perform an activity in order to produce a product or outcome. A technique is a well-defined systematic procedure for producing one or more outputs, that may also involve the use of one or more tools.The online learning environment may boost the frequency and quality of student participation for students who don't speak up much. Creating a professional online persona takes time and effort. Online learning assignments may assist students in transitioning from their preferred modes of communication on social media and related platforms to the adoption of a more comprehensive professional online persona Lewy, A wide range of technologies are employed, including digital libraries, remote learning networks, multimedia software, learning management systems, virtual simulations, mobile applications, and other e-resources Lewy.

- **Social Presence**

Social presence is defined by Short, et al., (1976) as the level of awareness of the other individuals in the engagement and the subsequent relevance of social interactions. The research of Tu, pursued to scientifically investigate the impact of social presence and found a positive link between improved social presence and student satisfaction with online learning. The amount of scientific on social presence theory has depended solely on students' self, according to Hakki, and the results of this study suggest that learning outcomes may not always line up with student perceptions. The gain of greater engagement due to higher social presence may be overshadowed by the extra processing requirements of the discussion format for disabled students etc who may find these needs extremely hard.

- **Attitude**

Attitudes are defined by various influential theorists in terms of evaluation (e.g., "a psychological tendency that is expressed by evaluating a particular entity with some degree of favor or disfavor," Eagly, affect (e.g., "the affect associated with a mental object," Greenwald 1989 p. 432), cognition (e.g., "a special type of understanding, prominently knowledge of which content is evaluative or affective. In their study, Unger, discovered that students had strong attitudes toward rapidly adjusting to a completely distance educational environment versus what they were more used to for education, or in-class learning. Alsoufi, found an appropriate level of understanding, attitudes, and procedures about e-learning, implying that e-learning was functional during the COVID-19 outbreak. Alharthi revealed that college students' attitudes toward the types of technologies used in online courses were not entirely satisfied with the advanced technology used in online classes at universities.

4. Objectives

The main objectives of this paper are:
- To identify the factors influencing students' perception towards online learning.
- To determine the relationship between the demographic variables and the factors of student perception.
- To find out the factors which are highly correlated with overall students' perception, and to identify the factor which is highly contributing to the student's perception in online learning.

5. Methodology

To address the above listed objectives, the following methodology was used. A survey was conducted and a total of 105 responses were collected. A questionnaire was framed on the basis of the factors identified in the literature review. Further, Chi-square analysis, Correlation and Regression analysis were performed in order to fulfill the objectives of the paper.

5.1. Data collection procedure

This survey aimed to figure out how students perceived online courses and the factors that influence them. University students, including junior college students, undergraduates, and postgraduates, were surveyed. We distributed questionnaires using WhatsApp, a popular messaging platform in India, and requested college students from diverse disciplines to answer them anonymously. A total of 105 legitimate responses were gathered in the process.

5.2. Questionnaire

Our data is divided into 3 sections. The very first section covers the demographic profile of the respondents like gender, age, kind of educational institution, and current course of study. The following section discusses the differences between online classes and regular classroom teaching, covering learning design, tools, and technology, as well as an online experience. There was a total of 9 questions in this section. The third section focuses on the students' individual qualities such as social presence, attitude, and interaction. There was a total of 7 questions in this section. These questions tested the students' comprehension of how online classes were viewed during the pandemic. The ratings were based on a five-point Likert's Scale: 1 (strongly disagree), 2 (disagree), 3 (neutral), 4 (agree), and 5 (strongly agree).

5.3. Data analysis

Our research was analyzed using IBM SPSS Statistics 21. We utilized Chi-Square, Regression, and Correlation tests to analyze the association between demographic characteristics (gender, age, educational sector, and educational qualification) and the six factors (online experience, interaction, learning design, tools and technology, social presence, and attitude) that we have identified. All tests were given a statistically significant of $p < 0.05$.
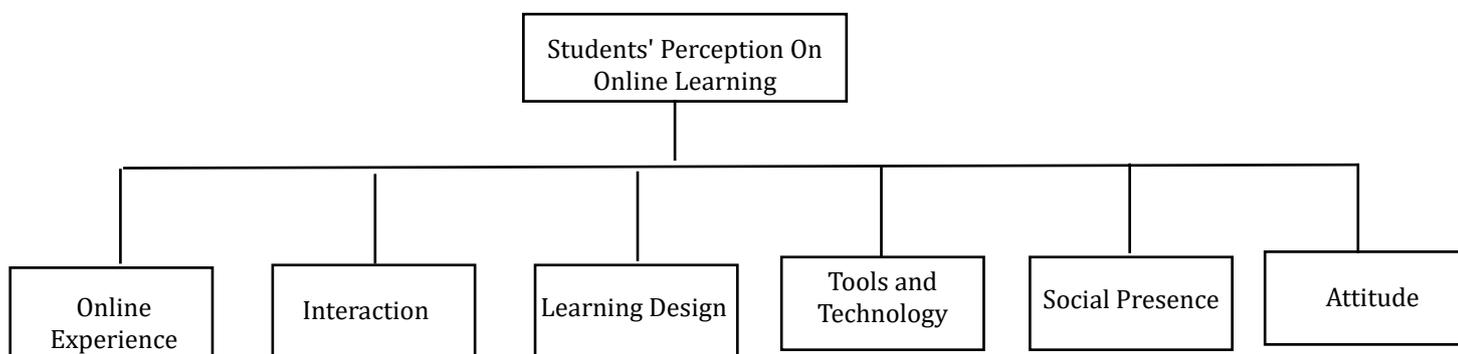

Figure 1. Block diagram of the Potential Contributing Factors for Students' Perception

6. Descriptive Statistics

Descriptive statistics were used to describe or summarize the characteristics of the data set, such as mean, standard deviation, and standard error of the student perception factors.

It can be inferred that the respondents gave learning design the highest rating in terms of influencing their life (3.71), followed by, Attitude (3.64), Interaction (3.55), Tools and Technology (3.47), Social Presence (3.32), and the Online Experience (2.55) received the lowest score. Cutoff mean for the overall factors was calculated to be 3.37. From the cutoff value, we can infer that students had a negative perception regarding online experience and social presence, whereas they had a positive perception towards interaction, learning design, tools and technology, and attitude.

6.1 Demographic analysis

Demographic analysis is a technique for determining the age, gender, educational sector, and educational level of the total number of respondents who made a significant contribution to the survey.

From the responses that we received, it was observed that females(50.48%) had the highest percentage in terms of gender when compared to males(49.52%). Similarly in terms of age 19-23-year-olds had the highest percentage(70.47%). Followed by Educational sector which accounted by the government with a percentage of 57.14% and in educational level Undergraduate had the highest responses of (75.23%)

6.2 Percentage analysis

It refers to a specific type of rate in which percentages are used to analyze two or more sets of data. The association between the series is determined using a percentage. Percentage analysis was carried out to highlight the major responses of the factors by the respondents.

Table 1. Descriptive Statistics

Factors	Mean	Std. Error	Std. Deviation
Online Experience	2.55	0.09	0.91
Interaction	3.55	0.06	0.57
Learning Design	3.71	0.07	0.70
Tools and Technology	3.47	0.07	0.76
Social Presence	3.32	0.05	0.54
Attitude	3.64	0.09	0.88

Table 2. Demographic Characteristics of the Respondents (n=105)

Sl. No.	Demographic Characteristics	Frequency (N=105)	Percentage (%)
1	Gender:		
	Male	52	49.52
	Female	53	50.48
2	Age:		
	16-18	26	24.76
	19-23	74	70.47
	24-27	5	4.76
3	Educational sector:		
	Government	60	57.14
	Autonomous	45	42.86
4	Educational level:		
	Pre-University	19	18.09
	Undergraduate	79	75.23

Table 2. Respondents' perception of Online Classes concerning the factors identified (n=105)

	Factors	Strongly disagree(%)	Disagree(%)	Neutral(%)	Agree(%)	Strongly agree(%)
1	Online Experience					
	Effectiveness	18.1	49.52	14.29	13.33	4.76
	Convenience	10.48	40.95	20	21.9	6.67
2	Interaction					
	Lack of interaction	2.86	7.62	15.24	63.81	10.48
	Low Quality of discussion	4.76	10.48	10.48	57.14	17.14
	Difficulty in clarification of doubts.	6.67	8.57	15.24	50.48	19.05
	Comfortability to interact in discussions.	12.38	13.33	44.76	15.24	14.29
3	Learning design					
	Poor structure	4.76	13.33	14.29	53.33	14.29
	Time saving	2.86	10.48	9.52	55.24	21.9
4	Tools and technology					
	Technical issues	1.9	2.86	6.67	55.24	33.33
	Lack of computer skills	13.33	18.1	49.52	14.29	4.76
5	Social presence					
	Difficulty to understand	9.52	52.38	21.9	10.48	5.71
	Anxiousness	4.76	15.24	20.95	49.52	9.52
	Distraction	5.71	14.29	14.29	50.48	15.24
	Learning and knowledge transfer	4.76	10.48	9.52	53.33	21.9
6	Attitude					
	Laziness	5.71	7.62	11.43	60.95	14.29
	Less Motivation	4.76	8.57	20.95	56.19	9.52

Students disagreed that online programmes are more effective (49.52%) and convenient (40.95%) than classroom education based on the online experience factor. Many students felt that there is a lack of engagement (63.81%) and difficulties in clarifying doubts (50.48%) in online classes, and that the general quality of talks (57.14%) is lower. The majority of students were undecided about the comfortability of interacting in discussions during online sessions (44.76%). Although the majority of students believed that the organization of online classes was bad (53.33%), they also said that online classes saved time (55.24%). Although the most significant disadvantage of online classes was a technical difficulty (55.24%) that the majority of students experienced. According to the percentage study, half of the pupils had a neutral opinion on the absence of resources and knowledge about computers (49.52 %). During online classes, the majority of students (50.48%) said that they were distracted. They did agree, however, that learning and information transfer were better (53.33%) and that they were less worried (49.52%) during online lectures. The majority of students disagreed that online classes were difficult to follow (52.38%). The majority of students indicated that participating in online class discussions was difficult for them because they were lethargic (60.95%) and unmotivated (56.19%).

7. Chi-Square Analysis

Chi-square analysis is conducted in order to check if the demographic factors such as gender, age, educational level and educational sector has a significant impact on factors of student perception which are Online learning, Interaction, Learning design, Tools and technology, social presence and Attitude.

The proposed hypotheses tested under the Chi-Square analysis are:
- H1: Gender of the students does not have a significant impact on factors of students' perception.
- H2: Age of the students does not have a significant impact on factors of students' perception.
- H3: Educational level of the students does not have a significant impact on factors of students' perception.
- H4: Educational sector to which the students belong does not have a significant impact on factors of students' perception.

Note- Null hypothesis gets accepted if p < 0.05, else it is rejected.

Table 4. Chi-Square test and demographic analysis with respect to the factors of Students Perception

Demographic Profile		Satisfied	Dissatisfied	χ^2tab value	χ^2cal value	Decision
Gender	Male	45	08	33	0.006	Reject
	Female	20	32			
Age (Years)	16-18	15	06	66	0.028	Reject
	19-23	46	28			
	24-27	04	06			
Educational Level	PU	13	07	66	0.043	Reject
	UG	45	29			
	PG	06	05			
Educational Sector	Government	42	17	33	0.012	Reject
	Autonomous	23	23			

Table 5. Correlation analysis on students' perception with the factors.

Correlation Matrix	Students' Perception	Online Experience	Interaction	Learning Design	Tools and Technology	Social Presence	Attitude
Students' Perception	1						
Online Experience	0.153	1					
Interaction	0.760**	-0.128	1				
Learning Design	0.626**	0.255**	0.334**	1			
Tools and Technology	0.573**	-0.271**	0.437**	0.057	1		
Social Presence	0.704**	-0.064	0.591**	0.361**	0.322**	1	
Attitude	0.551**	-0.480**	0.473**	0.102	0.394**	0.355**	1

From table 4, it can be proved that all the considered demographic factors such as gender, age, educational sector, and educational level have a significant impact on the factors of students' perception which are Online experience, interaction, learning design, tools, and technology, social presence, and attitude. The stated null hypothesis for all the considered factors has been rejected since the χ^2tab value is greater than the χ^2cal value for all the calculations.

8. Correlation Analysis

Correlation analysis can help in revealing significant relationships between different dependent and independent variables and also the significant relationship between the independent variables. The correlation matrix for all the variables is displayed in the table below.

It can be observed from the correlation table that the factors with high degree correlation between the student's perception on online learning are Interaction (0.760) then followed by Social Presence (0.704), learning design (0.626), Tools and technology (0.573) and Attitude (0.551).

The factor with lowest correlation degree with students' perception is found to be Online experience (0.153). The rest of the factors are negatively as well as positively correlated with one another ranging from (-0.480) up to a good correlation of(0.760).

9. Regression Analysis

Regression analysis was carried out to determine the impact of each factor on Students' perception. Skewness is a measure of lack of symmetry, and it is used to check whether the Linear Regression assumption of Normality is met. Table 6 depicts the independent variables with the measure of skewness for each to justify the normality assumption for the regression analysis. Since the measure of skewness for the average of all variables is in between -2 to +2, the normality assumption is justified. Thus, the regression analysis of the students' perception of its potential independent variables is then conducted. The table below lists the variables and the skewness metric for each to support the regression analysis' normality assumption. The significance value is taken as 0.05.

Table 6. Normality assessment of the independent variables

Factors	Skewness	Std. Error of Skewness
Online Experience	0.84	0.24
Interaction	-1.38	0.24
Learning Design	-0.70	0.24
Tools and Technology	-0.88	0.24
Social Presence	-1.32	0.24
Attitude	-1.25	0.24

Table 7 depicts the results of the final regression model of all the factors of student perception. The beta coefficient values of all the factors are significant, at the level of 0.05.

Table 7. Regression coefficients of students' perception on online learning

Factors	Beta Coefficient	R2	F	t-value	Sig
Online Experience (OE)	0.065	0.023	2.460	1.568	0.00
Interaction (INT)	0.509	0.577	140.740	11.863	0.00
Learning Design (LD)	0.346	0.392	66.406	8.149	0.00
Tools and Technology (TT)	0.290	0.328	50.332	7.095	0.00
Social Presence (SP)	0.505	0.496	101.230	10.061	0.00
Attitude (ATT)	0.242	0.304	44.950	6.704	0.00

Students Perception = 2.2368 + 0.023(OE) + 0.577(INT) + 0.392(LD) + 0.328(TT) + 0.496(SP) + 0.304(ATT)

From table 7, it is observed that Interaction (0.509) had the most effect on Students' Perception followed by Social Presence (0.505), Learning Design (0.346), Tools and Technology (0.290), Attitude (0.242) and the factor which had the least effect was found to be Online experience (0.065).

Thus, by converting the Beta Coefficients value of each factor into percentages, we can observe that the factor Interaction contributes up to 26.01% of total students' perception followed by social presence contributing up to 25.80%, Learning design contributes up to 17.68%, Tools and Technology contributes up to 14.82%, Attitude contributes up to 12.37% and finally, online experience contributes up to 3.32% of the total Students' perception regarding online learning during the COVID-19 pandemic.

10. Conclusion

The curves of the education system are changing as efforts to prevent the spread of the novel coronavirus are made, with online education becoming the primary means of instruction. To keep up with the curriculum, universities and institutions are shifting to online platforms. The perception and readiness of students is important consideration that we have attempted to document. According to the findings of this study, the students had a negative perception towards online classes in the aftermath of COVID-19. But for some of the students, online learning was found to be advantageous because it provided them with flexibility and convenience. Students preferred well-structured content. However, most students reported that online classes could be more difficult than traditional classroom classes due to technological constraints, lack of interaction, and difficulty in clarifying doubts. As a result, all of these factors should be considered when creating an online course in order to make it more effective and productive for the learner. It's possible that once the COVID-19 pandemic settles down, we may see a continued increase in education systems using online platforms for study aids, albeit in a hybrid mode in combination with regular classes.

Helping students who lack online experience gain it, as well as expanding and making online class engagement more exciting, will have a greater beneficial impact on perspective. Improving the learning style and structure of online classes based on student feedback can have a higher impact on students. Regardless of their experience, training and guiding students on advanced tools and technologies can assist them in operating the technical parts of electronic equipment. Students' social presence and attitude must come from within, and this may be accomplished by addressing all of the elements we've outlined. As a result, it can be stated that online classes may be beneficial, but they must be implemented effectively, taking into account all of the factors identified in our research will aid in improving students' perception towards online learning.

References

1. I. Akour, M.A. Baity, A.Q.A. Hamad, A Moderated Mediation Model of Perceived E-Learning within the UAE Education Sector: A Practical Study, A.Q.A.

2. M. Alharthi, Students' Attitudes toward the Use of Technology in Online Courses, International Journal of Technology in Education, 3(1) (2020) 14-23.

3. E.Y. Almomani, A.M. Qablan, F.Y. Atrooz, A.M. Almomany, R.M. Hajjo, H.Y. Almomani, The Influence of Coronavirus Diseases 2019 (COVID-19) Pandemic and the Quarantine Practices on University Students' Beliefs About the Online Learning Experience in Jordan, Frontiers in Public Health, 8 (2021).

4. E. Alqurashi, Predicting student satisfaction and perceived learning within online learning environments, Distance Education, 40(1) (2019) 133-148.

5. A. Alsoufi, A. Alsuyihili, A. Msherghi, A. Elhadi, H. Atiyah, A. Ashini, A. Zaid, Impact of the COVID-19 pandemic on medical education: Medical students' knowledge, attitudes, and practices regarding electronic learning, PLoS ONE, 16(11) (2020).

6. K. AW, Lay epistemics and human knowledge: Cognitive and motivational bases. New York, USA, (1989).

7. H. Baber, Determinants of students' perceived learning outcome and satisfaction in online learning during the pandemic of COVID-19, Journal of Education and e-Learning Research, 7(3) (2020) 285-292.

8. M. Bączek, M. Zagańczyk Bączek, M. Szpringer, A. Jaroszyński, B. Wożakowska Kapłon, Students' perception of online learning during the COVID-19 pandemic: a survey study of Polish medical students, Medicine,100(7) (2021).

9. E.T. Baloran, Knowledge, attitudes, anxiety, and coping strategies of students during COVID-19 pandemic, Journal of loss and trauma, 25(8) (2020) 635-642.

10. J.B. Biggs, K.F. Collis, Evaluating the quality of learning: The SOLO taxonomy (Structure of the Observed Learning Outcome). New York: Academic Press, (1982).

11. Cojocariu - V.M. Cojocariu, I. Lazar, V. Nedeff, G. Lazar, SWOT anlysis of e-learning educational services from the perspective of their beneficiaries, Procedia-Social and Behavioral Sciences, 116 (2014) 1999-2003.

12. M. Cosmina, B. Anca, An emigrant teachers' excursion in the world of digital native students, Procedia-Social and Behavioral Sciences, 128 (2014) 262-268.

13. I. Dahlstrom Hakki, Z. Alstad, M. Banerjee, Comparing synchronous and asynchronous online discussions for students with disabilities: The impact of social presence, Computers & Education, 150 (2020).

14. Daniel, J. Daniel, Education and the COVID-19 pandemic, Prospects, 49(1) (2020) 91-96.

15. N. Diana, W. Yunita, A. Harahap, Student'S Perception and Problems in Learning English Using Google Classroom During the Covid-19 Pandemic, Linguists: Journal Of Linguistics and Language, (2021).

16. A.H. Eagly, S. Chaiken, The psychology of attitudes, Harcourt brace Jovanovich college publishers, (1993).

17. K. Gravemeijer, P. Cobb, Design research from a learning design perspective, In Educational design research, (2006) 29-63.

18. Hadi, A.G. Hadi, M. Kadhom, N. Hairunisa, E. Yousif, S.A. Mohammed, A review on COVID-19: origin, spread, symptoms, treatment, and prevention, Biointerface Research in Applied Chemistry, 10(6) (2020) 7234-7242.

19. S.M. Hamid, Online digital platforms during covid-19 in EFL classes: Visual impairment students' perception, ETERNAL (English, Teaching, Learning, and Research Journal), 6(2) (2020) 328-339.

20. J. Hattie, H. Timperley, 'The power of feedback', Review of educational research, 77(1) (2007) 81-112.

21. J.L. Howland, J.L. Moore, Student perceptions as distance learners in Internet-based courses, Distance education, 23(2) (2002) 183-195.

22. R. Klein, C. Tomassoni, G. Rajaaman, M. Winchester, N. Eizenberg, P. Sinnayah, First Year Student Perception and Experience of Online Topographical Anatomy Laboratory Classes using Zoom Technology during the COVID-19 Pandemic. International Journal of Innovation in Science and Mathematics Education, 29(3) (2021).

23. Ku, H. Y., Tseng, H. W., & Akarasriworn, C. (2013). Collaboration factors, teamwork satisfaction, and student attitudes toward online collaborative learning. Computers in human Behavior, 29(3), 922-929.

24. D. Levy, Online, blended and technology-enhanced learning: Tools to facilitate community college student success in the digitally-driven workplace, (2017).

25. Littlefield, J. Littlefield, The Difference between Synchronous and Asynchronous Distance Learning, (2018).

26. M. Maison, D.A. Kurniawan, L. Anggraini, Perception, attitude, and student awareness in working on online tasks during the covid-19 pandemic, Jurnal Pendidikan Sains Indonesia (Indonesian Journal of Science Education), 9(1) (2021) 108-118.

27. J.L. McBrien, R. Cheng, P. Jones, Virtual spaces: Employing a synchronous online classroom to facilitate student engagement in online learning, International review of research in open and distributed learning, 10(3) (2009).

28. T. Muthuprasad, S. Aiswarya, K.S. Aditya, G.K. Jha, Students' perception and preference for online education in India during COVID-19 pandemic, Social Sciences & Humanities Open, 3(1) (2021) 100-101.

29. D. Nambiar, The impact of online learning during COVID-19: students' and teachers' perspective, The International Journal of Indian Psychology, 8(2) (2020) 783-793.

30. T.P. Novak, D.L. Hoffman, Y.F. Yung, Measuring the customer experience in online environments: A structural modeling approach, Marketing science, 19(1) (2000) 22-42.

31. D. Pal, V. Vanijja, S. Patra, Online Learning During COVID-19: Students' Perception of Multimedia Quality.

In Proceedings of the 11th International Conference on Advances in Information Technology, (2020) 1-6.

32. N. Peimani, H. Kamalipour, Online Education in the Post COVID-19 Era: Students' Perception and Learning Experience, Education Sciences, 11(10) (2021).

33. J.B. Rieley, Corona Virus and its impact on higher education, Research Gate, (2020).

34. M.F. Saifuddin, E-learning dalam persepsi mahasiswa, Jurnal Varidika, 29(2) (2018) 102-109.

35. S.S. Sarkar, P. Das, M.M. Rahman, M.S. Zobaer, Perceptions of public university students towards online classes during COVID-19 pandemic in Bangladesh, In Frontiers in Education, 6 (2021).

36. M.A. Shereen, S. Khan, A. Kazmi, N. Bashir, R. Siddique, COVID-19 infection: Origin, transmission, and characteristics of human coronaviruses, Journal of advanced research, 24 (2020).

37. J. Short, E. Williams, B. Christie, The social psychology of telecommunications, Toronto; London; New York: Wiley, (1976).

38. K. Shraim, Online examination practices in higher education institutions: learners' perspectives, Turkish Online Journal of Distance Education, 20(4) (2019) 185-196.

39. V. Singh, A. Thurman, How many ways can we define online learning? A systematic literature review of definitions of online learning (1988-2018), American Journal of Distance Education, 33(4) (2019) 289-306.

40. V. Solanki, P. Dabas, J. Solanki, Perspective Of Indian Students On Online Learning In The Wave Of Global Pandemic-Covid 19, Elementary Education Online, 19(2) (2020) 1364-1380.

41. B.B. Sommer, R Sommer, A practical guide to behavioral research: Tools and techniques. Oxford University Press, Teaching, 7(1) (1997) 10-22.

42. C.H. Tu, The impacts of text-based CMC on online social presence, The Journal of Interactive Online Learning, 1(2) (2002) 1-24.

43. S. Unger, W.R. Meiran, Student Attitudes towards Online Education during the COVID-19 Viral Outbreak of 2020: Distance Learning in a Time of Social Distance, International Journal of Technology in Education and Science, 4(4) (2020) 256-266.

44. E.D. Wagner, In support of a functional definition of interaction. American Journal of Distance Education, 8(2) (1994) 6-29.

45. B. Zaveri, P. Amin, V. Nasabinmana, Efficiency of Online Learning in the Modern Technology Era-Students' Perception Towards Online Learning, Journal of Marketing Vistas, 10(1) (2020) 35-47.

46. W. Zhang, S. Qin, "A brief analysis of the key technologies and applications of educational data mining on online learning platform," 2018 IEEE 3rd International Conference on Big Data Analysis (ICBDA), (2018) 83-86.