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RESEARCH ARTICLE

Current Scenario of E-Learning after the Covid-19 Pandemic in the Kingdom of Saudi Arabia: An Empirical Analysis

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ABSTRACT

The COVID-19 Epidemic has interrupted teaching-learning process in a all the educational of institutions. This pandemic showed the preparedness of the universities and colleges to cope up with these types of calamities. The main technique used to tackle such crisis is online learning in Saudi Arabia. Two online surveys were conducted to explore the perception of students and teachers towards this new learning process which have been used in place of traditional teaching method after few months of using this method in Saudi Arabia. To look on it, the study conducted to figure out students' as well as faculty's perception towards online education, using 2 surveys, first has been diffused to 78 faculty participants and second to 294 students who were chosen on random basis to explore the benefits, efficacy, and challenges of education provided online. There is a speedy increase in number of programs to provide online education in the colleges and universities in the course of COVID-19 widespread. According to the results of the studies, the diffusion of online courses is usually equal in mostly areas. Furthermore, both the students and faculties concurred that online education is efficacious especially in the period of outbreak, study concluded. The study also shows that faculty and students accepted that effective communication is an important factor and by using online platform of learning technical subjects can also be delivered successfully. This study can be helpful for educational institutions to attain a common perspective of faculty and students for online education. For providing online classes effectively internet and various technologies have been useful in education sector also. Moreover, the current phase of epidemic has added up the significance of online classes globally. Therefore, it becomes more important to acknowledge teacher-learners' perceptions towards online learning.

1. INTRODUCTION

Change is the law of nature and it is unavoidable, hence everything in this world becomes outdated with development, so there is a constant need to have the ability to cope up with change. Online learning is basically mentioned as the application of network and technology for teaching-learning process(Kulal and Nayak). Online learning is also manifested as a "technology-enabled transfer of skills and knowledge to a large number of recipients" (Kinshuk et al.). It is a rapid growing trend of use of technology in the education sector (Dziuban et al.). All the educational institutions has to convert their teaching methods to match up the demands of users and imparting an ideal learning environment, because of rapid development in the area of internet and World Wide Web (WWW) (Xu). The online class can be defined as a platform on which learners can grasp knowledge of subjects, clear their doubts with teacher, dispense learning material, talk about problems with companions, and track their progress in academics with the help of internet and various technologies. Now a day, online education has been so much befitting that this is presumable to be anticipated in every formal modules of education. Besides, due to the spread of COVID in the world, the need of online education has also increased (Khan, T. Kamal, et al.).. There are approx 370million users are using Internet and

assisting online learning to develop speedily in India. Currently, above 3billion people are using the online platform to learn (Kulal and Nayak). In India, Increasing "CAGR" online learning percentage is approximately 19% by 2020 (Technavio's market research analyst prediction). As per the contemporary Coursera's report, among the wide ranging online education contributors in the world, out of 18m registered learners, 1.3million users are in India, who makes it the third widest market of online education after the USA and China (Khan, Alhumoudi, et al., 2024). Although there is fast growth in online education mode, it is at advance phase of development. The perception and attitude of the teachers and students are important to encouragement and learning in this scenario (Koohang and Durante). Eventually, the teacher-students' acceptance assists in getting the advantages of online learning (Khan, Husain, Minhaj, et al., 2024). Therefore, this study attempts to analyse the perceptivity of students and teachers on the efficacy of online education over face to face classroom learning (Fish and Gill).

2. REVIEW OF LITERATURE

The advancement of online learning in present time is the reason of growth in the number of online courses conducted by colleges and schools (Beatty and Ulasewicz). Besides this, students' demand and technological evolution for online classes (Bennett and Lockyer; Priyadarshani and Jesuiya) transformed colleges and universities to execute online courses with normal learning (Minhaj et al., 2024). The notable thing is online learning in schools is not required, yet it is pondered as an advance technique for dealing with challenges throughout the learning process (Agustina and Cahyono). Now the planning is being done by many universities to invest in modern classes and on training and recruitment of faculty to teaching online (Floyd; Koehler et al.). A survey depicts that online learning would grow more remarkably in educational institutions and in corporate organizations in near future (Meyen et al.). It is supposed that online learning is interactive because of these recent developments(Johnston) and online education provides environment to students where they get engaged actively with the content and learn practically (McNair) and also brings up the understanding as they attain new knowledge (Haider et al., 2024). Furthermore, online learning has been more important in past few years globally and it shifted the idea of universities "Online class is an Optional" to "Online class is necessary" (Larreamendy-Joerns and Leinhardt).

Most of the colleges enacted online learning courses without perfect plans, even so they initiated faculty development program at first (Sun and Chen).The use of Internet in learning process has also lessened the cost of classroom teaching, likewise, it assists learners by providing many opportunities to learn different courses (Murday et al.). Students and teachers' views towards E-learning have been checked by many researches. It has been concluded that the major causes for having classes online by the learners are "flexibility" and "self–control" in the learning conditions, and they apprehended that online learning could be an easy way of learning in comparison to face to face classroom teaching (syed mohd minhaj, Altaf khan, n.d.). The main advantage is lied in terms "Price" and "self-directed learning" (Armstrong)and learners from the face to face method of teaching have felt for the social aspects comprehended in online education, yet online students have already experienced it positively, although their expectations in learning aspects have not always converged by the online courses and both types of the learners apprehend online learning as convenient but not certainly beneficial to their learning (Khan et al., 2023). As the role of online classes is significant in the process of learning, Schools and colleges need to contemplate the influence of online classes (Alawamleh et al.).

Students perceive online learning positively but on the other hand the other participant of this study there is mixed perception of teachers about it (Khan, 2025). It should be analysed by the teachers, what is presented in current and which one is the better idea to introduce a subject in such a manner that it can provide proper understanding and knowledge of subject by conducting "Faculty perceptions," "mentoring," "best practices" and "training,". Most of the faculty member suggested that by conducting faculty development programs they can instruct online classes effectively and also can be best mentor in their career journey (Vaill and Testori), and (Groccia) brought out the significance of developing a sensation of community by online education from teachers' perspective (Khan, 2025). There are numerous researches that support the crux of "Training and Development" for conducting online learning effectively (DiPietro et al.). As per (Apriyanti et al.), 74% of K-12 online educators

suggest to promotional development programs need to be included to the school programs to improve the teaching capability of teachers (Khan et al., 2022).

A number of researches show the various advantages of online learning like convenience of time, easy access and lessen cost (Khan, Vivek, et al.), Thus these factors create the difference between online learning and offline learning, most of the learners who performed successfully in offline classrooms(Kebritchi et al.) are not that much fruitful in the online classes. Even, learners who got score below 2.9 in GPA, get more successful results in online classes in comparison to the learners with high GPA score (Sugilar). There is also a belief of some students that the degree/certificate acquired after taking online classes is not that much valid as by taking offline classes. This might influence the number of students to apply for online courses. hence, the awareness programs concerning the significance of online learning can help out (Platt et al.) (Bejerano). The students should possess some skills like, learning capability, revised learning practice, ability to enhance new vocabulary and capability to discuss their doubts with teachers patiently, to conduct the classes online in effective manner. It can be concluded from these reviews that perceptivity of instructors and students for online education need to be explored. The online learning have been compulsory for all universities and colleges in the whole world after the COVID widespread (Khan, Vivek, et al.). So, a study was done to gather the data about the suggestions and perceptions of both instructors and students for online technique of teaching (Khan, Ali, et al., 2024).

3.Objective of the Study

The most important aim of conducting this study is to examine teacher-students' perceptivity towards online education. This research attempts to explore the advantages of online learning from the students and teachers' point of view and also check their perception towards online education platform adopted by the colleges and universities in Saudi Arabia.

4. Hypotheses of the Study

The present study has formulated the following hypothesis:

1. **H_1:** There is a significant positive relationship between Platform of Online Learning (POL) and Perception of Faculty's towards Online Learning (PFOL).

2. **H_2:** There is a significant positive relationship between Platform of Online Learning (POL) and Perception of Students' towards Online Learning (PFOL).

5. RESEARCH METHODOLOGY

Our study is based on primary data that were collected from the instructors and students enrolled in various universities in Saudi Arabia. For the purpose of data collection, we prepared a modified questionnaire and disseminated it in the same manner to various university students through online platforms. Therefore, our study is non-interventional in nature and survey-based. We had mentioned the core objective of the study in the survey instrument, i.e., "First, we asked the participants to take part in a research study, and the main aim behind conducting this research was to elicit feedback of the university students at large regarding their perception toward e-learning and effectiveness of online sessions amid the COVID-19 lockdown phase. We sincerely request you to actively participate in this survey. The information collected through this survey will be exclusively used for academic purpose only and it will be kept strictly confidential." In brief, we collected Informed Consent Letters from students which comprised the title of the study, the necessary details of all the investigators involved in the present study, the purpose, the study procedures, and the risks and benefits associated with the study, and the ethical standards of the research were respected.

5.1 Participants of the Study

Students and Instructors at the higher educational level were the Population of this study. The sample was chosen from this population on random basis of 78 member from faculty and 294 students, which is considered significant to deliver valuable responses on the outlook of students and faculty members towards online education. This study has been conducted two surveys using internet, which were delivered to respondents when the universities in Saudi Arabia were closed to prevent the widespread. These 2 online surveys have been designed by using Google Forms and distributed to the members of faculty and students using Facebook Messenger, Emails, Telegram and WhatsApp

to maintain social distancing. There were fifty males and twenty-eight females' participants from faculty member group in this survey. 54 faculty participants are holding Ph.D. and 24 are holding master's degree. 27 participants are Professors, 18 Associate Professors, whereas 33 are Assistant Professors. In contrast, 156 are males and 138 are females out of 294 students. On account of streams, 175 are from theoretical discipline while 119 are the part of practical streams. Among them, 189 use mobile and 78 use laptops to take online classes whereas 27 students use tablet.

5.2 Data Gathering Instruments

These online surveys have been designed by using Google Docs. A portion of survey related to faculty have of three categories namely, "present status", "educational qualification", and "faculty's perceptions for online teaching's effectiveness". In contrast, the students' survey has again three categories namely socio-demographic, students' perceptions for online learning's effectiveness" and "challenges". This survey has been created according to the Likert Scale for rating the statements. These surveys were reviewed by two experts and required changes were done prior to distributing it to the participants. For this study, participation has been done voluntarily and personal information has not been collected. Data have been imported into Excel to assists "SPSS" analysis by 25 version.

5.3 Validity and Reliability Analysis

Survey's design was checked by the two experts. Some item are omitted due their irrelevancy by taking the expert's comment into account. To check reliability, internal consistency measure "Cronbach's alpha" has been used to show the items' relatedness. Two survey's items are consistent as per the result. The "coefficient alpha" for the 30 items is 0.947 for the survey of faculty members and for the students' survey; it is 0.896 which shows that the items are having relatively high internal consistency. The reliability coefficient of 0.70 or above is considered as "acceptable" in various social science conditions of research. Apart from this, "SmartPLS 3.0" has been conducted by the researcher to analyse the perceptions of survey's participants for e-learning.

6. RESULTS AND DISCUSSION

The findings have been organised as per the sections of the survey:

6.1 Faculty's and Students' Perceptions of Online Learning

Student's suggestion is most important in the education system. Unless and until students adopt online education as their learning method, it cannot be taken further in future even though it has become the important fragment. That's why; the survey is conducted to explore the effect of E learning/classes on students' studies. A questionnaire has been designed to inspect selected variables by asking statements on a "five-point Likert scale", ranging from One (strongly disagree) to Five (strongly agree). Instructor is another important part of teaching-learning process. Their skills and concern about online teaching are necessary features. There are few significant questions arise such as; how do teachers comprehend online classes and whether they are able to handle online classes etc prior to adopt this technique as some members of faculty might not have the aptitude to teach students online. Hence, the researcher discerned that it would be better to accumulate the opinions of both the participants, i.e. instructors and learners. Following hypotheses have been formulated by the researcher to explore the students' and teachers' perception for online learning.

1. H_1: There is a significant positive relationship between Platform of Online Learning (POL) and Perception of Faculty's towards Online Learning (PFOL).

2. H_2: There is a significant positive relationship between Platform of Online Learning (POL) and Perception of Students' towards Online Learning (PFOL).

For the purpose of testing the above two alternative hypotheses, SmartPLS3.0 was used by the researcher. The measurement model and the associated results from the PLS-SEM software is exhibited in the Figure-1& 2 and Tables-1, 2, 3, 4 & 5 respectively.

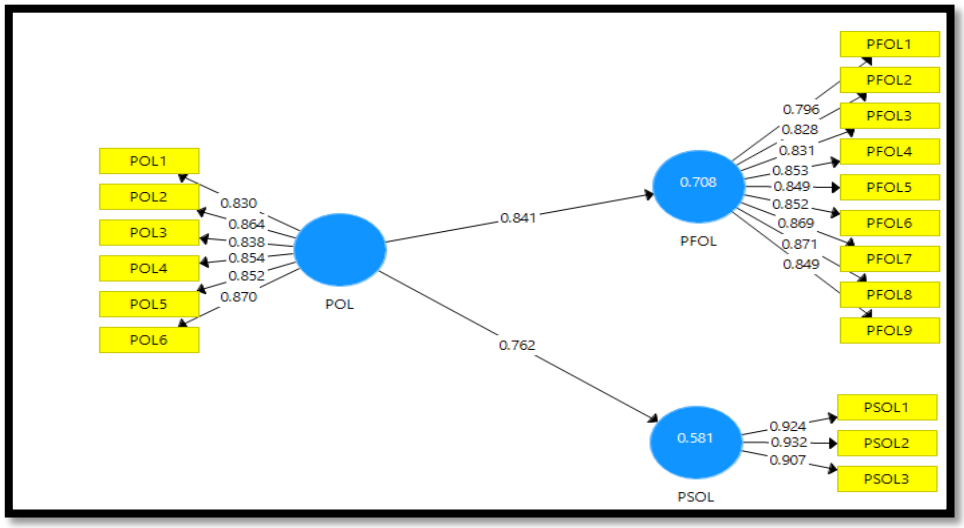

Fig-1: Measurement Model from SmartPLS3.0

In the Figure-1, Platform of Online Learning (POL), Perception of Faculty towards Online Learning (PFOL) and Perception of Students towards Online Learning (PSOL) are represented by circles since they are the Latent Constructs used by the researcher in the study. POL is measured through six statements codes as POL1 to POL6 represented by rectangles since they are manifest variables. Similarly, PFOL and PSOL are measured with the help of nine coded as PFOL1 to PFOL9 and three statements coded as PSOL1 to PSOL3 respectively. Th factor loading values are shown near the arrows pointing to the respective items/constructs. In order to solve the problem of redundancy between the items and improving the results three statements coded as PSOL4 to PSOL6 were deleted by the researcher on account of low factors loading values.

Table-1: Mean, Standard Deviation and Factor Loading

Construct	Item	Mean	Standard Deviation	Factor Loading
PFOL	PFOL1	3.99	1.159	0.79
	PFOL2	3.96	1.060	0.82
	PFOL3	3.84	1.063	0.83
	PFOL4	3.73	1.109	0.85
	PFOL5	3.68	1.118	0.84
	PFOL6	3.47	1.130	0.85
	PFOL7	3.60	1.144	0.86
	PFOL8	3.78	1.123	0.87
	PFOL9	3.76	1.132	0.84
POL	POL1	3.77	1.139	0.83
	POL2	3.94	1.124	0.86
	POL3	3.51	1.228	0.83
	POL4	3.72	1.145	0.85
	POL5	3.71	1.154	0.85
	POL6	3.83	1.071	0.87
PSOL	PSOL1	3.72	1.235	0.92
	PSOL2	3.77	1.124	0.93
	PSOL3	3.54	1.144	0.90

The aforesaid table shows that the mean values of all the items are more than 3 reveals the agreement of students and faculties towards online learning/classes since the researcher used the five-point likert scale ranging from Strongly Disagree (1) to Strongly Agree (5). The factor loadings of all the measured variables are more than the threshold limit of 0.70. So, we can say that all the statements are clearly explaining their respective theoretical assumed construct.

6.1.1 Convergent Validity

The results regarding the convergent validity of the measurement model is exhibited in the Table-2 given below.

Table-2: Convergent Validity

Factor	Cronbach's Alpha	Rho-A	Composite Reliability (CR)	Average Variance Extracted (AVE)
PFOL	0.950	0.950	0.957	0.713
POL	0.924	0.924	0.941	0.725
PSOL	0.910	0.911	0.944	0.848

Table-2 of Convergent Validity clearly depicts that all three constructs met the required thresholds limit as the value of Composite Reliability (C.R) was above 0.7 and Average Variance Extracted (AVE) exceeded 0.5 (Sarstedt et al.). The value of Cronbach's Alpha and rho-a value establish internal consistency was also greater than 0.7 (Adepoju and Adeniji). Therefore, the convergent validity of the constructs was proved.

6.1.2 Discriminant Validity

To check the discriminant validity, the Fornell-Larcker and cross-loading criteria have been examined. Discriminant validity shows "the extent to which the measure is adequately distinguishable from related constructs within the nomological net".

Table-3: Discriminant Validity–Fornell-Larcker Criterion

Factors	PFOL	POL	PSOL
PFOL	0.848		
POL	0.841	0.852	
PSOL	0.843	0.762	0.921

The aforesaid analysis of discriminant validity depicts the Fornell-Larcker criterion. In this criterion we take the square roots of Average Variance Extracted of the available constructs. The values show in the above table i.e. PFOL (0.848), POL (0.852) and PSOL (0.921) which were more than the correlation values between each construct and other constructs. So, discriminant validity has been achieved as per the Fornell-Larcker criterion (Fornell and Lacker).

Table-4: Discriminant Validity–Loading and Cross-Loading Criterion

Factor	PFOL	POL	PSOL
PFOL1	0.871	0.681	0.691
PFOL2	0.849	0.700	0.686
PFOL3	0.831	0.736	0.691
PFOL4	0.853	0.712	0.691
PFOL5	0.849	0.722	0.731
PFOL6	0.852	0.702	0.733
PFOL7	0.869	0.726	0.748
PFOL8	0.871	0.714	0.732
PFOL9	0.849	0.702	0.703
POL1	0.702	0.830	0.634
POL2	0.717	0.864	0.642
POL3	0.719	0.838	0.657
POL4	0.732	0.854	0.693
POL5	0.715	0.852	0.651
POL6	0.714	0.870	0.614
PSOL1	0.787	0.705	0.924

PSOL2	0.788	0.722	0.932
PSOL3	0.753	0.678	0.907

Table-4 represents the cross-loading criterion in which all constructs' loadings have been more than cross-loadings with other constructs over the columns. Hence, discriminate validity was ascertained according to the cross-loading criterion (Henseler et al.).

6.1.3 Structural Equation Model

Whenever evaluating the structural model, multicollinearity must be examined to ensure that the results are valid**.** The Variance Inflation Factor (VIF) values ranged from 2.35 to 4.152, indicating that the model lacked multicollinearity (Akinwande et al.). Following that, the structural model was tested using the bootstrapping approach (3000 resamples) to determine the relevance of the hypotheses formulated by the researcher in the present study.

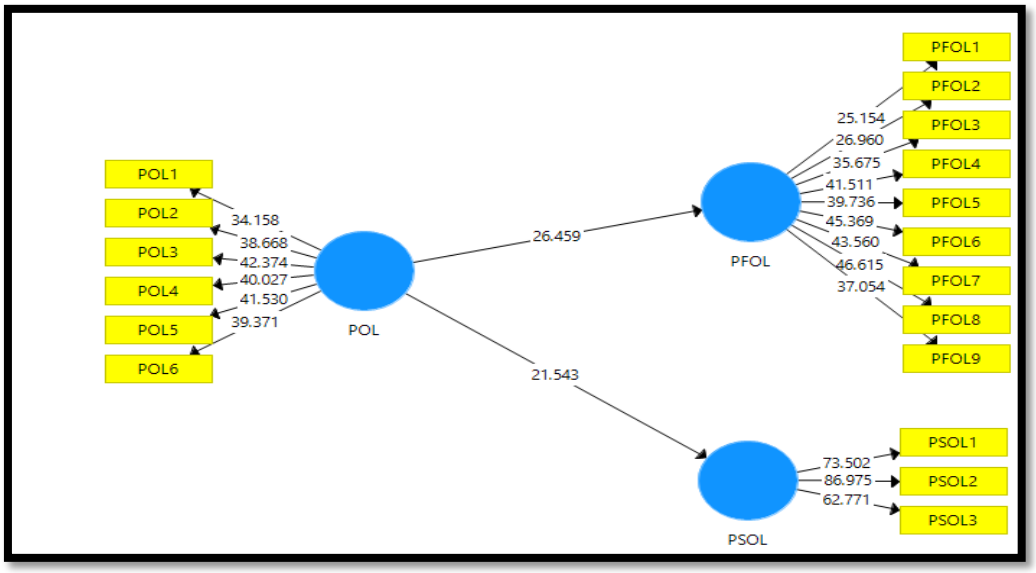

Fig-2: Structural Equation Model (SEM)

The above PLS-SEM model reveals that the t-values are more than threshold limit of 1.96 for the regression weights concludes that each path is significant at the 5 percent significance level or better (i.e. the estimated path parameter is significant). The results extracted from the SEM model exhibited in the Table-5 given below.

Table-5: Impact of Online Learning and Testing of Hypotheses

Hypothesis	Path	β	t-value	p-value	Result
H_1	POL→ PFOL	0.841	26.333	<0.001	Supported
H_2	POL→PSOL	0.762	21.567	<0.001	Supported

Table-6 concludes that the aforesaid results supported the alternative hypotheses i.e. H_1 and H_2 formulated by the researcher in this research study. It also reveals that Platform of Online Learning (POL) is positively related to the Perception of Faculty towards Online Learning (PFOL)since the high βeta value i.e. 0.841, t-value is 26.333>1.96 and p-value is 0.001 at 5% alpha level. On the same way, Platform of Online Learning (POL) is also positively related to the Perception of Students towards Online Learning (PSOL)since the high βeta value i.e. 0.762, t-value is 21.567>1.96 and p-value is <0.001 at 5% alpha level. Thus, the results depict that there is a significant positive relationship between POL & PFOL and POL & PSOL. In other words, we can say that Platform of Online Learning adopted by the higher educational institutions in Saudi Arabia during this unprecedented phase of ongoing outbreak is positively perceived by the students and faculties.

6.2 Challenges of Online Learning during COVID-19 Pandemic

The students highlighted the issues and challenges which they encountered during online learning because of the hasty transformation of learning methods from traditional instruction mode to online

mode. Responses of the students manifested that they have encountered following challenges: - Firstly, learners confronted a challenge in adaptation of online education. This issue may be aroused due to have such problems due to technical constraints. Secondly, students confronted another challenge in accessing the internet due to the cost of network; some students could not afford it. They reported that confronted difficulty in time management and organisation of tasks due to submission of their assignments. Besides this, the issues related to interaction and reflection of their progress also confronted as a challenge by the students. Furthermore, an unavoidable challenge also highlighted which was related to the adjustment of differently able students with their special needs.

Moreover, the insufficiency of students' assessment tools during the online classes also confronted by the students. Even instructors are not able to identify individual differences of students quickly during online class. The most important issue faced by students was data privacy, as the use of mobile, laptop etc at home can expose their data.

Table-6: Challenges of Online Teaching and Learning During COVID-19 Outbreak

Statements	**Mean**	**Standard Deviation**
Adaptability Struggle	3.774	0.952
Technical and Internet Issues	3.923	0.894
Organization of Work Process & Time Management	3.622	0.779
Lack of Interaction	3.901	0.887
Insufficient Tools for Student Assessment	3.628	0.786
Adjusting of Online Courses to Deaf or Hard of Hearing Students & Students with Disabilities	3.687	0.994
Data Privacy & Security	3.847	0.983

It is clear from the Table-6 that the research sample assents with the challenges faced by students during online classes with the mean scores of more than 3 and the values of standard deviation are less than 1. Out of these challenges, technical and internet issues take the first rank with a mean of 3.923 and a standard deviation of 0.894. Second major challenge for the students is lack of interaction with a mean of 3.901 and a standard deviation of 0.887. The third major issue in online teaching and learning is data privacy and security with the mean score of 3.847 and the standard deviation is 0.983.

CONCLUSION

Online learning provides a platform to learn in a unique and different way. It influenced the lives of teachers and students positively. Education has also been improved by using the online education platform. Teachers and students both have optimistic perception for the online platform, although, online learning still has a lot to improve. Thus it can be proved; there are many benefits of online learning moreover it has increased the rate of literacy by spreading to each and every place in the world.

Yet there are a number of things to take care of by the universities and colleges in Saudi Arabia. These can be stated as; internet connectivity improvement, infrastructure facilities for online learning, changes in the outlook of learners and instructors, and recognize the hindrance of online teaching and learning etc. There are many challenges which have been faced by the students during online classes for the proper transformation of offline learning to online learning platform, such as; connectivity related internet issues, data privacy and security, and insufficiency of interaction between learner and instructor. Online learning platforms encourage learner-centred mode of learning and it is effortlessly fit in the period of calamities like COVID-19 widespread. The colleges and universities in Saudi Arabia may train their students to secure their data. Furthermore, telecommunication companies should be advised by the government to provide the internet services at reasonable prices to the students. Face to face classroom learning mode was teacher-centred while online classes mode is based on learner-centred environment which demands students to be self-directed and self-motivated. There is a need to change the outlook of the students towards online classes by the teachers and universities. To bring this change training and development programs must be running by educational institutions or government for the teachers and students on regular basis. This study has also shown that online learning has a potential platform in the near future, so it cannot replace by traditional offline classroom mode. Though a proper transformation to online

education is complex but the advantages of using e-learning also cannot be avoidable. Therefore, this is more important to identify the obstacles in adopting online learning and figure out their solutions as well.

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Data Availability: The data used to support the findings of this study are available from the corresponding author upon request

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