



# Study on the Effectiveness of Online Platform for Efficient Learning Amongst Tourism Students during COVID-19

Nimina Ramachandran\*, Sindhu R. Babu\*\*

**Abstract** COVID-19 is a pandemic that has affected over 170 countries around the world. Since the beginning of 2020 the world has witnessed dramatic changes in many sectors including the education system. The COVID-19 pandemic possesses a huge challenge in the way the traditional education system functions. In India, as the virus captured the community, students confined to their homes and academic community were forced to explore the medium of digital technology to provide education that reach beyond the school boundaries into the homes of millions of students. There are concerns from the stake holders in education about effectiveness of online teaching in comparison with social context of traditional class room learning. This study examines online learning in tourism higher education during the period of lockdown due to COVID-19 pandemic. Study aims to identify the effectiveness of the online teaching during the lockdown period. It also discusses the possible benefits and disadvantages of using e-learning in higher education for tourism and identifies the effectiveness of various online platforms for e learning among tourism students. The reliability of the self made instrument used for data collection is measured using Cronbach's alpha. To identify the factors, the Exploratory Factor Analysis has been used. Exploratory factor analysis increases the reliability of the scale and the dimensionality of items constructed by analysing the existence of relationships between perception of respondents and online learning. To validate the instrument, Confirmatory Factor Analysis was used while AMOS was used to construct an online education model. The findings of this study offer useful suggestions to academicians to get more familiar with the main factors of the e-learning system. The study also helps student community by identifying shortcomings in the online learning trajectories so that the online learning can be strengthened. The study is predominantly focused in the state of Kerala, India

**Keywords:** COVID-19, Online Learning, Tourism Education, EFA, CFA

## INTRODUCTION

The unexpected spread of a life threatening disease caused by Corona Virus (SARS-CoV-2) named COVID-19 shocked the whole world. It was declared as a pandemic by the World Health Organization on 11th March, 2020. The learning environment of more than 1.5 billion school going students and young people in 165 countries are impacted by the lock down of educational institutions due to the COVID-19 outbreak (UNESCO, 2020). This condition challenged the worldwide education system, and compelled educators to adapt an online classroom environment. Many countries have made the transition from the traditional class room based methods to e-learning whereby teaching is undertaken

remotely and on digital platform. The e-learning situation in the pandemic situation is totally different from the normal scenario as it became the main medium of education adopted. Likewise, one has to not only concentrate on the advantages of e-learning in emergencies but must also take into account the content of the virtual courses offered in these circumstances. In early 2020 itself Chinese Universities have started experimenting with online education instead of traditional in-class, face-to-face education (Bao, 2020).

During the pandemic, e-learning resources play a key role. E-learning refers to utilising the digital methods and computer programmes. Key elements of e-learning include software technologies and mechanisms like web-based learning, computer-based learning, interactive classrooms

\* Research Scholar, Kannur University, Kerala, India. E-mail: nimina662@gmail.com

\*\* Assistant Professor, Mahatma Gandhi University, Kottayam, Kerala, India. Email: sindhurbabu@gmail.com

and automated partnerships. The content is distributed with multimedia capabilities through the internet, intranet, extranet, radio, cable, and CD-ROM. In modern days, e-learning is a common term for any technology assisted learning that uses different teaching and learning mediums such as telecommunications bridges, audio and videotapes, teleconferencing, satellite communications etc. through the accepted web-based training or computer-assisted coaching (Tanveer, 2015). E-learning platforms can support learning professionals in organizing, planning, implementing and monitoring the curriculum and teaching process. It also seeks to support students, colleges and universities to facilitate the education of students during university and school closing periods. It is an added advantage that most the e-learning platforms are offering free usage of their applications up to an extent which ensure consistent learning during this global pandemic of COVID-19 (Amin, 2020). It is an opportunity and challenge for academic community as well as the education policy makers to develop e-learning modules and teaching strategies that cater to the different needs of student community. The unplanned nature and the crisis situations of pandemic has presented many obstacle for students, parents, teachers and faculty members while accommodating and embracing e-learning (Affounch, 2020).

## The Objectives of the Study

The study aims to identify the effectiveness of the online teaching during the lockdown period. It also discusses the possible benefits and disadvantages of using e-learning in higher education for tourism. The study also identifies the effectiveness of various online platforms for e-learning among tourism students. The paper is structured with introduction followed by literature review. It continues with methodology regarding the discussion on factors identified through exploratory factor analysis. To validate the instrument, Confirmatory Factor Analysis was used, while AMOS was used to construct an online education model which could be effective during this lockdown period.

## REVIEW OF LITERATURE

### Evaluating the Pros and Cons of Online Education Scenario during Pandemic

Student's perception and learning experiences are one of the most significant criteria for determining the quality of online education. Saxena, K. (2020) in his paper identified some of the advantages and disadvantages of conducting online classes. In addition, he also tried to compare online education through e learning platforms with that of traditional classroom teaching methods. He found that, though most students were able to concentrate better in his or her studies

within their home's warmth devoid of disturbing classmates, access to internet and net speed were the major hurdles faced by them during online classes. According to Martin (2020), traditional education helps to provide information on an incremental basis along with real time feedback as compared to online education where it is difficult to analyse student's understanding of various subjects. Moreover, these could be poorly organized and there is a significant risk of delivering too much in a very less time. Martin continues to propose Load Reduction Guidelines as a way forward towards reducing risks caused by online learning. Several products have been launched by Google as well for promoting online education free of cost. Basilaia (2020) found out that eight products could be considered as part of online learning : Gmail – for transfer of information, Classroom – for mimicking a classroom like environment along with material sharing; Forms – a part of Google docs that help to ask questions to students as part of academic responsibilities; Calendar – Scheduling tool for online lectures; Drive – online storage for recorded academic sessions; Jamboard and Drawings – the online tools for drawing and writing that can replace the whiteboard; Hangouts Meet – live lecture environment with up to 100 participants and OBS - Open Broadcaster Software for recording the lectures.

Internet bandwidth issues, lack of training, and lack of exposure in digital learning platforms were stated by Kumar as problems to be addressed by higher education teachers who have engaged virtual classes (Kumar, 2020). He then continues to state that lack of awareness, more number of absentees, lack of human touch, less personal interactions due to connectivity issues as significant drawbacks of virtual classes. Dhawan (2020) has done a SWOT analysis to assess online mode of learning during lockdown period. The strength identified in the study shows that time and location flexibility, reach to wider audience, easy availability of course & content, and immediate feedback are all advantages for online learning. The limitations such as technical issues, time management, distractions, anxiety & confusion, lack of personal/physical attentions are issues to be addressed in online mode of learning. The study indicates that the online learning presents opportunities to both teachers and students such as scope of innovations & digital development, designing flexible programs, strengthening problem solving skills, developing innovative thinking skills & adaptability skills etc. Teachers can device appropriate pedagogical approaches and EdTech start-ups that have the potential to make revolutionary changes in the field of education. In addition Dhawan (2020) also mentioned some of the main challenges of online learning such as digital illiteracy, unequal distribution of ICT infrastructure, technology cost & obsolescence that require attention from the authorities.

The factors such as innovativeness, consistency, sharing of knowledge and faith were found to yield better acceptance

of the e-learning program among students (Salloum, 2019). The inexperience of teachers, the knowledge deficit, and the dynamic home environment are found to be major shortcomings in online learning process as per the study findings of Murgatrottd, (2020). Kumar (2020) has pointed that new developments in the field of online learning can help the education sector to innovate new ways of teaching. It may also encourage students' personalised learning. He further pointed out that learning with social distancing may continue and educational institutions may run with different shifts per day. Assessment, evaluation, preparing mark-sheets monitoring the performance of student may be changed to new shape. Kumar (2020) also stated that teaching and learning may run with technology, blended learning combines both traditional and online learning modes may take the leading role in the future, demand for Open and Distance Learning (ODL) and online learning may grow. He also mentioned the negative trends in online learning. Fresh graduates who are expected to enter the labour market in the near future may find it difficult to secure a suitable job, national and international student mobility for higher study may be reduced, student attendance may slow down,

## Impact of COVID-19 on Education in India

India holds an important place in the global education industry. According to All India Survey on Higher Education (AISHE) web portal, the country has more than 1.4 million schools with over 3.73 crore students, 14.16 lakhs teachers, more than 39931 colleges and 10725 standalone institutions listed on the AISHE web portal. India has one of the largest higher education systems. According to the statistics published by University Grants Commission (UGC) in 2020, total number of universities in India are 945 (53 central, 412 state, 356 private, and 124 deemed to be universities). However, there is still a lot of potential for further development in the education system. All education institutions were closed in India from 12 March,

2020 onwards due to COVID-19 pandemic. The state governments started temporarily shutting down schools and colleges across the country and postponed or rescheduled the examinations including engineering, medical, law, agriculture, fashion and designing courses, etc. Currently, the temporary closures of higher education institutions due to the COVID-19 pandemic are no longer news, because most countries have stopped face-to-face teaching.

The covid 19 epidemic is also a motivation for students to take action in this unpredictable environment, make responsible choices, resolve issues in a constructive manner and, most notably, adapt to circumstances where skills need to be learned (Jadhav et al., 2020). To ensure that these skills will be elementary for all students, flexibility must be developed in our educational systems. Many of the organizations have taken the initiative to promote telecommunications, skype, zoom and other digital applications to minimise educational gap. It helps to train students and teachers to use interactive classrooms and technologies to promote exchange of information.

The University Grants Commission under Ministry of Human Resource Development has constituted expert committees to suggest measures to continue with the teaching learning process in higher education institutions during lockdown due to COVID-19. The committees has suggested various measures regarding online learning process and revised academic calendar for the conduct of academic activities. UGC has suggested various e-learning platforms and has approved online PhD public viva voce for research scholars and addressed various concerns of student community. The entrance examination for various courses was postponed to ensure the safety of the students. The MHRD and the UGC have been emphasizing to continue with the teaching-learning process using online modes. INFLIBNET is an umbrella of online digital library supported by UGC that provide various online resources to students, research scholars and students.

The details of online learning platforms provided by UGC and MHRD are given in table-1

**Table 1: List of Online Learning Platforms Provided by UGC and MHRD**

Online Platform	Characteristics	Website
Swayam	<ul style="list-style-type: none"> <li>Provides Massive Open Online Courses</li> <li>140 universities approved credit transfer feature.</li> </ul>	<a href="http://storage.googlepis.com/uniquecourses/online.html">http://storage.googlepis.com/uniquecourses/online.html</a>
E-pg pathshala	<ul style="list-style-type: none"> <li>Superior quality, syllabus based, interactive e-content</li> <li>In 70 postgraduate disciplines in social sciences, arts, fine arts, and humanities, natural and mathematical sciences, 23000 modules (e-text and video) are included.</li> </ul>	<a href="http://epgp.inflibnet.ac.in">epgp.inflibnet.ac.in</a>
E-content courseware in ug subjects	<ul style="list-style-type: none"> <li>E-content of approximately 24110 e-content modules in 87 Undergraduate courses</li> </ul>	<a href="http://cec.nic.in/">http://cec.nic.in/</a>

Online Platform	Characteristics	Website
Swayamprabha:	<ul style="list-style-type: none"> <li>A set of 32 DTH networks that provide both teachers , students and people across the country interested in life - long learning with high-quality educational curriculum-based course material covering various disciplines such as arts, science, commerce, performing arts , social sciences and humanities topics, engineering , technology, law, medicine , agriculture, etc.</li> </ul>	<a href="https://www.swayamprabha.gov.in/">https://www.swayamprabha.gov.in/</a>
Cec-ugc youtube channel	<ul style="list-style-type: none"> <li>Provides completely free access to limitless lectures based on the curriculum.</li> </ul>	<a href="http://www.youtube.com/user/cecedusat">http://www.youtube.com/user/cecedusat</a>
National digital library	<ul style="list-style-type: none"> <li>Provides interface support for leading Indian languages for all academic levels including researchers and lifelong learners, all disciplines, all popular form of access devices and differently abled learners</li> </ul>	<a href="https://ndl.iitkgp.ac.in/">https://ndl.iitkgp.ac.in/</a>
Shodhganga	<ul style="list-style-type: none"> <li>A forum for research scholars to deposit their Ph.D.</li> <li>Open to the whole student community in open access</li> </ul>	<a href="https://shodhganga.inflibnet.ac.in/">https://shodhganga.inflibnet.ac.in/</a>
E- shodh sindhu	<ul style="list-style-type: none"> <li>A list of long-term access to e-journals , e-journal archives &amp; e-books.</li> <li>It consists of 10,000 + e-journals and 31,35,000 + e-books.</li> </ul>	<a href="https://ess.inflibnet.ac.in/">https://ess.inflibnet.ac.in/</a>
Vidwan	<ul style="list-style-type: none"> <li>A leading database and national network of research</li> <li>Primarily for scientists and other faculty members working in India's leading academic institutions and other research and development organisations.</li> </ul>	<a href="https://vidwan.inflibnet.ac.in/">https://vidwan.inflibnet.ac.in/</a>
Shodh suddhi:	<ul style="list-style-type: none"> <li>Initiated by MHRD</li> <li>Provides access to all universities / institutions in India with Plagiarism Detection Software (PDS)</li> </ul>	<a href="http://shodhshuddhi.inflibnet.ac.in">shodhshuddhi.inflibnet.ac.in</a>
Virtual lab	<ul style="list-style-type: none"> <li>Developed web-enabled curriculum based experiments designed for remote operation.</li> <li>Remote-access to Labs in various disciplines of Science and Engineering</li> <li>Digital Laboratories cater to undergraduate, postgraduate and research academic students.</li> </ul>	<a href="http://www.vlab.co.in">http://www.vlab.co.in</a>
e-GyanKosh	<ul style="list-style-type: none"> <li>National Digital Repository to store and share the digital learning resources</li> <li>Developed by the Open and Distance Learning Institutions of India</li> <li>Protected by copyright, with all rights reserved by Indira Gandhi National Open University</li> </ul>	<a href="http://egyankosh.ac.in/">http://egyankosh.ac.in/</a>
Gyandarshan	<ul style="list-style-type: none"> <li>A web-based TV channel dedicated to Open and Distance Learners' educational and developmental needs.</li> </ul>	<a href="http://www.ignouonline.ac.in/gyandarshan/">http://www.ignouonline.ac.in/gyandarshan/</a>
Gyandhara	<ul style="list-style-type: none"> <li>An internet audio counselling service offered by IGNOU</li> <li>It is a web radio where students can listen to the live discussions by the teachers and experts on the topic of the day and interact with them through telephone, email and through chat mode.</li> </ul>	<a href="http://ignouonline.ac.in/Gyandhara/">http://ignouonline.ac.in/Gyandhara/</a>
e-Adhyayan (e-Books)	<ul style="list-style-type: none"> <li>Offering 700 + Post-Graduate Course e-books</li> <li>All e-books are extracted from the courses of e-PG Pathshala</li> <li>It also supports the video content play-list.</li> </ul>	<a href="http://www.eadhyayan.com">www.eadhyayan.com</a>
e-Yantra	<ul style="list-style-type: none"> <li>Provides hands on experience on embedded systems.</li> <li>It has about 380 Lab and made 2300+ colleges benefited</li> </ul>	<a href="https://www.e-yantra.org/">https://www.e-yantra.org/</a>
FOSSEE (Free/Libre and Open Source Software for Education)	<ul style="list-style-type: none"> <li>Developed to promote open source software for education as well as professional use</li> </ul>	<a href="https://fossee.in/">https://fossee.in/</a>
SAKSHAT	<ul style="list-style-type: none"> <li>One Stop Education Portal for addressing all the education and learning related needs of students, scholars, teachers and lifelong learners.</li> <li>Portal provides the latest news, press releases, achievements etc related to Ministry of HRD</li> </ul>	<a href="https://sakshat.ac.in/">https://sakshat.ac.in/</a>
National Educational Alliance for Technology (NEAT)	<ul style="list-style-type: none"> <li>An initiative for skilling of learners in latest technologies through a Public-Private partnership model between the Government (through its implementing agency AICTE) and the Education Technology companies of India.</li> </ul>	<a href="https://neat.aicte-india.org/">https://neat.aicte-india.org/</a>

Online Platform	Characteristics	Website
DIKSHA	<ul style="list-style-type: none"> <li>• Online portal for education in schools</li> <li>• It provides teachers, parents and students with learning resources related to the specified school curriculum.</li> <li>• In various Indian languages, it has more than 80,000 e-content products, catering to Grades 1-12.</li> </ul>	<a href="https://seshagun.gov.in/sha-gun">https://seshagun.gov.in/sha-gun</a>
e-PATHSHALA	<ul style="list-style-type: none"> <li>• A online portal and Smartphone app developed and introduced by the National Council for Educational Research and Training</li> <li>• There are 1886 audios, 2000 videos, 696 ebooks (e-Pubs) and 504 flip books in various languages for classes 1st to 12th.</li> </ul>	<a href="http://epathshala.nic.in">http://epathshala.nic.in</a> or <a href="http://epathshala.gov.in">http://epathshala.gov.in</a>
NATIONAL REPOSITORY OF OPEN EDUCATIONAL RESOURCES (NROER):	<ul style="list-style-type: none"> <li>• A portal loaded with the highest quality information on numerous subjects in multiple languages, with a total of 14527 archives, including 401 sets, 2779 documents, 1345 digital documents, 1664 audios, 2586 photographs and 6153 videos in different languages.</li> </ul>	<a href="http://nroer.gov.in/welcome">http://nroer.gov.in/welcome</a>
NISHTHA	<ul style="list-style-type: none"> <li>• An online platform and mobile app for teacher training</li> </ul>	<a href="http://nishtha.ncert.gov.in">nishtha.ncert.gov.in</a>
Ug/ pg moocs	<ul style="list-style-type: none"> <li>• Hosts learning material of the SWAYAM UG/PG( Non- Technology) archived courses</li> </ul>	<a href="http://ugcmoocs.inflibnet.ac.in/ugcmoocs_courses.php">http://ugcmoocs.inflibnet.ac.in/ugcmoocs_courses.php</a>

Source: [www.ugc.ac.in](http://www.ugc.ac.in), [www.mhrd.gov.in](http://www.mhrd.gov.in), Kumar, P. J (2020).

## Online Learning in Kerala

The government of Kerala has initiated virtual classes through a government sponsored television channel called ‘victers’ in order to facilitate education during the pandemic. The channel under the programme ‘First Bell’ also live streamed education sessions through online video platform ‘YouTube’ and applications for mobile phones are made available as well. Samagra Shiksha Kerala and SIET (State Institute of Education Technology) have monitored the conduct of classes through the television channel. The sessions are scheduled on all week days for all classes from 1 to 12th standard. The duration of the classes varies from thirty minutes to two hours. The classes on various platforms are absolutely free for all students. The government of Kerala has also made instruction to regional school authority’s to arrange necessary infrastructure facilities to students from economically backward sections of society to attend online classes. The department of education has, however, stressed that online education is only a temporary arrangement and traditional class room teaching is the preferred mode of education and it will be restarted as soon as possible.

It is also to be noted in several backward regions, political parties, student organisations, private individuals and charity organisations have come forward to distribute television sets or smart phones to the students who cannot afford them. Local youth clubs and libraries have voluntarily set up facilities that help students to attend online classes. Various NGOs and local self-government institutions have also identified and provided support to students to access online classes.

## Tourism Education in Kerala

In Kerala, the board of higher secondary education, colleges, universities, and private institutions have established and delivered tourism education to the youths. The Vocational Higher Secondary School (VHSE) tourism course helps students to acquire practical and technological skills that are important to the field. There are currently 25 vocational higher secondary schools in Kerala offering travel and tourism courses. 675 students choose for the VHSE Travel and Tourism course every year ([www.scert.kerala.gov.in](http://www.scert.kerala.gov.in)).

Kerala Institute of Tourism and Travel Studies (KITTS) established in the year 1988, provide quality education and training in the field of Travel and Tourism. The institute’s MBA in Travel and Tourism and BBA in Tourism Management are affiliated with the University of Kerala. In addition, the Institute provides courses guided by short-term industry demand and undertakes extension activities such as training, capacity-building projects, and research and consultation on various aspects of tourism development. The Institute for Hotel Management and Catering Technology (IHMCT), Kovalam, Thiruvananthapuram was established in the year 1990 by the Ministry of Tourism, Government of India. IHMCT is started as part of a nationwide network of 21 existing Central Hotel Management Institutes affiliated with the National Hotel Management and Catering Technology Council, Noida.

The Calicut University Degree in Tourism started in the year 1995. In 1998, Kannur University started its tourism

graduate programme and initiated its PhD in tourism in 2016. In 2010, Mahatma Gandhi University launched the school of tourism studies as a higher learning centre in the field of tourism. With a specialisation in aviation management, tour operations and health tourism, the department offers a master's degree in tourism management. The school has been serving as a research centre with PhD programme since the academic year 2015-16. Mahatma Gandhi University offers PhD in the main areas of tourism such as sustainable tourism, destination management, tourism product development, and tourism industry sectoral studies. The Kerala University Institute of Management is also offering a full-time MBA in travel and tourism from the year 2010. Under the faculty of management studies, Cochin University of Science and Technology offers a self-financed full-time MBA in travel and tourism (Nimina 2018).

## METHODOLOGY

### Survey Instrument

The survey instrument consisted of social demographic data sheet and questionnaire regarding perception of teachers and students on e learning during lockdown period. Self made instrument is used for data collection. The respondents were asked to report the level of their agreement on a 5-point Likert scale from "Strongly Disagree=1" to "Strongly Agree=5". The 12 variables are included in the survey instrument.

### Participants and Data Collection

A sample of 233 responses was collected from different parts of Kerala. Tourism Students with different educational backgrounds (undergraduate, master or doctoral) and online learning experience responded using a Google online survey. The demographic information includes gender, age and educational background. As shown in Table 2, about 48.1% were female and 51.9% were male. Approximately 39.1% were undergraduates; 55.8% were masters, and 5.2% were doctorate. 37.3% of participants were teachers, 4.7% were research scholars and 57.9% were students. The important point that we can observe is that approximately 29.2% of respondents have experienced the educational portals such as swayam, edx, etc. and 37.3% of respondents have heard about educational portal but never experienced any educational portal. If we observe data, approximately 33.5% of participants never heard about any educational portal.

Out of total 233 respondents 68 respondents have reported that they don't hear and have any prior experience on using online educational portals. Hence the study restricted to 165 respondents. The other 68 respondents have not marked their answers with respect to online mode of education.

**Table 2: Demographic Statistics**

Measure	Category	Number	Percentage (%)
Gender	Male	121	51.9
	Female	112	48.1
	Total	233	100
Age	15-20	61	26.2
	21-25	97	41.6
	26-40	70	30.0
	Above 40	5	2.1
	Total	233	100
Education	Bachelor Degree	91	39.1
	Masters	130	55.8
	Doctorate	12	5.2
	Total	233	100
Profession	Teachers	87	37.3
	Research scholars	11	4.7
	Students	135	57.9
	Total	233	100
University	Calicut University	69	29.6
	Kannur University	62	26.6
	Kerala University	60	25.8
	MG University	42	18.0
	Total	233	100
Experience of educational portal such as swayam, edx, courser etc	Heard but never experienced about any educational portal	87	37.3
	Yes, I have experienced	68	29.2
	Never heard about any educational portal	78	33.5
	Total	233	100

**Table 3: Analysis of Frequency Distribution Table**  
**The results of the survey were recorded as follow**  
**SA- Strongly Agree, A- Agree, N- Neutral, D- Disagree, SD- Strongly Disagree**

Statements	SA	A	N	D	SD
Internet Facility is accessible at home	49.7%	23.6%	20.6%	4.2%	1.8%
Online teaching is interesting during lockdown period	20.6%	23.6%	26.1%	21.2%	8.5%
Adequate training both for teachers as well as students is provided for E learning platforms	15.2%	21.8%	21.8%	26.1%	15.2%
E-learning improves the quality of higher education	20.6%	27.3%	24.2%	20.6%	7.3%
The practicals could be dealt through online teaching platform	12.7%	13.9%	24.2%	24.8%	24.2%
Educational Institutions have sufficient facility for E- learning	10.9%	17.6%	35.2%	25.5%	10.9%
E- learning is very economical for educational institutions to adopt	23%	30.9%	34.5%	6.1%	5.5%
Online classes are as effective as class room teaching	7.3%	13.3%	20.6%	27.3%	31.5%
Progress of students can be assessed and monitored through online teaching effectively	11.5%	15.2%	24.8%	27.3%	21.2%
Training to assess online resources should be a part of higher education curriculum	23.6%	23.6%	21.2%	17.6%	13.9%
E- learning is quite safe and has no privacy issues	42.4%	38.2%	9.1%	6.7%	3.6%
Post covid 19 online course / certificate program should be introduced by the university that is for the benefit of student community	30.3%	33.9%	21.8%	12.1%	1.8%

Of the total 165 respondents, 73% respondents agree or strongly agree that internet facility is accessible at home in the state of Kerala. During survey it was also found that majority of respondents agreed that training to assess online resources should be a part of higher education curriculum and introduction of online course/certificate program by university can benefit the student community post covid19. Overall, a vast majority (80.6%) of respondents agreed that e-learning is quite safe and no privacy issues. From the survey it was found out that adequate training was not given before conducting online classes. More than one by third (47.9 %) of the respondents agreed that e-learning improves the quality of higher education. Most of the respondents (58.8%) strongly disagree or disagree on the effectiveness of online class. According to them traditional class room is more beneficial than online class. Majority of respondents believes that progress of students cannot be assessed and monitored through online teaching effectively and the practicals cannot be done through online teaching platform. Study found that tourism educational institutions in Kerala do not have sufficient facility for e-learning.

### The Exploratory Factor Analysis

With an initial analysis run, the exploratory factor analysis method began to obtain eigenvalues for each factor in the data. Second, the Kaiser-Meyer-Olkin (KMO) Sampling Adequacy Test (KMO) and the Bartlett Sphericity Test were performed to determine the validity of the construct and to ensure that the data obtained were suitable for the exploratory factor study. To check the adequacy of the

sampling for the study, the KMO test was used, and Bartlett's Sphericity Test was used to assess if correlations between items were sufficiently significant for EFA (Yu Taeho, 2015). The KMO index varies from 0 to 1, with 0.50 considered to be sufficient for factor analysis. For factor analysis to be acceptable, the Bartlett 's Test of Sphericity ( $p < .05$ ) should be relevant (Tabachnick, 2007). Table 4 indicates an overall sampling adequacy value measure of 0.856 that falls within the acceptable range, i.e. above 0.50. Bartlett's test of Sphericity was significant, indicating that the sample and correlation matrix were appropriate for the analysis. As the basic assumptions of exploratory factor analysis are met by both of these tests, the data is considered suitable for exploratory factor analysis.

**Table 4: KMO and Bartlett's Test**

Kaiser-Meyer-Olkin Measure of Sampling Adequacy.	.856
Approx. Chi-Square	624.290
Bartlett's Test of Sphericity	Df
	66
	Sig.
	.000

Reliability of the questionnaire has been measured in the study by using cronbach's alpha. It is used to measure the internal consistency and reliability of the research instrument. The cronbach's alpha in the current research has been found at 0.856 which is bigger than the suggested minimum values of .5 (Field, 2009) and .6 (Tabachnick & Fidell, 2013) and it is acceptable. Hence it can be said that questionnaire is reliable and can be used for data analysis.

**Table 5: Total Variance Explained**

Component	Initial Eigenvalues			Extraction Sums of Squared Loadings			Rotation Sums of Squared Loadings		
	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %	Total	% of Variance	Cumulative %
1	4.416	36.801	36.801	4.416	36.801	36.801	3.543	29.524	29.524
2	1.507	12.557	49.358	1.507	12.557	49.358	1.876	15.630	45.154
3	1.032	8.601	57.958	1.032	8.601	57.958	1.537	12.805	57.958
4	.865	7.208	65.166						
5	.818	6.815	71.981						
6	.718	5.982	77.963						
7	.617	5.142	83.105						
8	.546	4.549	87.654						
9	.496	4.133	91.787						
10	.392	3.265	95.052						
11	.334	2.786	97.838						
12	.259	2.162	100.000						

Extraction Method: Principal Component Analysis.

A Principal Component Analysis is used to assess the factors that explain the most variance in the data used. In determining the number of factors to be retained for interpretation, Kaiser's criterion (eigenvalue > 1) was used. One of the fields of disagreement in the approach to factor analysis is the cumulative percentage of variance (criterion), particularly in various disciplines, such as natural sciences, psychology, and humanities. There is no fixed threshold although it has proposed such percentages. According to Hair et al, in natural sciences, variables can be stopped until at least 95% of the variance is explained. In the humanities, the explained variance is usually as low as 50-60% (Williams, 2010). The Table 5 indicates a cumulative variance percentage of 57.958% and a total of 3 components (factors)

with the eigenvalue > 1. For generating the component matrix, varimax rotation is used. The component matrix shows loading for the rotated factor matrix. For the rotated factor matrix, the component matrix shows the loading. The loadings of the factor reflect the degree to which the factor is correlated with a variable. For their factor loadings, the variables are examined. It is noticed that all factor loadings are above the 0.5 point. All the variables with their corresponding factors are retained. The three derived factors are called as the final stage of Exploratory Factor Analysis in such a way that the name represents the characteristics of the variables loaded into the factor. Along with the variables loaded onto them, Table 6 displays the final variables. A total of 57.958% of the variances in the data considered for the analysis are explained by the three factors.

**Table 6: The Items and Final Three-Factor Structure of Online Teaching for Tourism Education Stakeholders after Factor Reduction Procedures**

Factor	Mean	SD	Factor Loadings		
			1	2	3
<b>Factor 1: Quality</b>					
Online classes are as effective as class room teaching	2.376	1.256		.866	
The practical's could be dealt through online teaching platform	2.661	1.328		.829	
Online teaching is interesting during lockdown period	2.661	1.328		.829	
Adequate training both for teachers as well as students is provided for E learning platforms	3.267	1.245		.738	
Progress of students can be assessed and monitored through online teaching effectively	2.958	1.304		.731	
E-learning improves the quality of higher education	2.685	1.282		.696	
	3.333	1.221		.602	



Factor	Mean	SD	Factor Loadings		
			1	2	3
<b>Factor 2: Physical Infrastructure</b>					
E- learning is quite safe and has no privacy issues	4.091	1.052		.637	
E- learning is very economical for educational institutions to adopt	3.600	1.075		.627	
Internet Facility is accessible at home	4.152	1.100		.618	
Educational Institutions have sufficient facility for E-learning	2.921	1.142		.607	
<b>Factor 3: Institutional Responsibility</b>					
Post covid 19 online course / certificate program should be introduced by the university that is for the benefit of student community	3.788	1.064		.852	
Training to assess online resources should be a part of higher education curriculum	3.255	1.364		.680	

### Factor 1: Quality

The factors identified are named as Quality, Physical Infrastructure, and Institutional responsibility. The factor quality includes the variables such as effectiveness of online class, conduct of practicals through online teaching platforms, assessment and evaluation of students' progress through online, interest towards online teaching, quality improvement of e learning in higher education, training for e learning platforms. These variables loaded to the critical success factor viz. quality of online teaching. It shows that quality as one of the most critical factor in the success of online teaching in the country. Effectiveness of online class and improving quality of education through e learning are found to be having the maximum and minimum association with the factor quality (86.6% and 60.2%).

### Factor 2: Physical Infrastructure

The variables regarding internet facility, economical to adopt for educational institutions, facility for e learning and safety of e learning are categorized in physical infrastructure. Safety of e learning is found to be having the maximum association with the factor physical infrastructure (63.7%) followed by economical adoption of e learning in educational institutions (62.7%), availability of internet facility (61.8%), and facility for e learning in institutions (60.7%).

### Factor 3: Institutional Responsibility

The third and last critical success factor identified from the study is named as institutional responsibility as all the variables are connected to the responsibility of all educational institutions. They include introduction of new online course or certificate programs for the benefits of students after

covid 19 (85.2%) and assessing online resources to be a part of higher education curriculum (68.0%).

## Confirmatory Factor Analysis

To validate the instrument, Confirmatory Factor Analysis was used while AMOS was used to construct an online education model. Findings from EFA conducted in the first study (N = 165) indicated that the scores have three distinct factors that were labelled quality, physical infrastructure, and institutional responsibility. Researchers should consider the parameters of the different model fit indexes in order to discuss the CFA model fit. In determining model adequacy, chi-square (CMINDF: the chi-square / degree of freedom), Tucker Lewis Index (TLI), Comparative Fit Index (CFI), Incremental Fit Index (IFI), Normed Fit Index (NFI) and Root Mean Square of Error Approximation (RMSEA) are used. The cut-off point for TLI, CFI, NFI and IFI is between 0 to 1. (Schumacker & Lomax, 2004). The values in the range of the standard fit criteria (Schermelleh-Engel, Moosbrugger, & Müller, 2003., and Reyna et al, 2019 ) are follows

**Table 7: Standard Fit Criteria for CFA**

Measures	The Best Values	Acceptable Values
RMSEA	From .00 to .05	From .05 to .08
RMR	From .00 to .05	From .05 to .10
GFI	From .95 to 1.00	From .90 to .95
AGFI	From .90 to 1.00	From .85 to .90
CFI	From .95 to 1.00	From .90 to .95
RFI	From .90 to 1.00	From .85 to .90

**Table 8: Model Fit Measures (CMIN)**

Model	NPAR	CMIN	DF	P	CMIN/DF
Default model	27	54.480	39	.051	1.397
Saturated model	66	.000	0		
Independence model	11	619.283	55	.000	11.260

**Table 9: RMR, GFI**

Model	RMR	GFI	AGFI	PGFI
Default model	.074	.943	.904	.557
Saturated model	.000	1.000		
Independence model	.484	.451	.341	.376

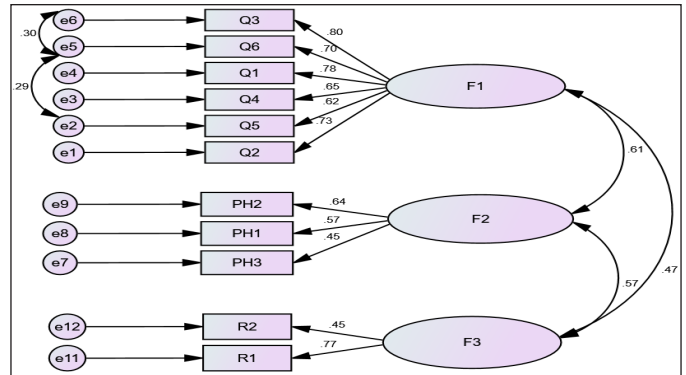
**Table 10: Baseline Comparisons**

Model	NFI Delta1	RFI rho1	IFI Delta2	TLI rho2	CFI
Default model	.912	.876	.973	.961	.973
Saturated model	1.000		1.000		1.000
Independence model	.000	.000	.000	.000	.000

**Table 11: RMSEA**

Model	RMSEA	LO 90	HI 90	PCLOSE
Default model	.049	.000	.078	.490
Independence model	.250	.233	.268	.000

The CMIN/DF ratio is taken and if found less than 3 is believed to be a good fit. In the above table the ratio is 1.397, hence the model can be said to be a good fit. Modification index has to be considered in order to obtain the required value for fit index test of TLI, IFI, NFI. According to Neal (Neal et al., 2008) the values of the NFI, CFI and IFI should range from 0-1 with a value close to 1 indicating a good fit. According to Hair, RMSEA with large number of samples help to understand whether the model fits or not, hence lower RMSEA indicates a good fit. RMSEA calculated here are 0.049 much less than 0.05 which indicates that the model has a good fit. The GFI value of this sample is 0.943, AGFI is .904. The CFI value is above 0.95, which indicates a good fit (Table 9). The PCLOSE is acceptable at 0.490, as is the RMSEA at 0.049 (Table 10). To increase these fit index values, item of R3 has to be deleted in order to reduce the discrepancy value. Creating covariance between e2 and e5, e5 and e6 have increased the values of fit index. The values are in the range of the standard fit criteria (Schermele-Engel, Moosbrugger, & Müller, 2003). Therefore, the model fit is acceptable.



**Fig. 1: Measurement Model using AMOS**

The above figure indicates the standardized estimates of the factors. It could be seen that all factors are correlated with the value of most of them above 0.50. The fit indices are summarized in Table 9, 10, 11.

## RECOMMENDATION

Recommendations to improve online learning:

- The universities can provide easy access to the study materials through online learning platforms
- Providing electronic devices, such as laptops, mobile phones, for deserving students to facilitate online learning
- Providing instructions and training on e-learning platforms and computer skills for teachers.
- Offering virtual resources directly from the research lab to replicate laboratory work or live streaming.
- Providing quizzes and assignments through online during sessions to measure the degree of students' understanding.
- The multimedia resources such as videos and 3D animation for practical learning is substantially more powerful than written materials such as power point and pdf.
- Providing open multimedia tools such as e-books and educational videos for practical lessons.
- Decrease the amount of class work may help to reduce the students' tension and stress.
- The study shows that many of the students have never heard about any online educational portals such as swayam, edx etc. so the educational institutions should take initiatives to make students aware about this.

## CONCLUSION

This study attempted to identify the critical success factors for online teaching in tourism higher education sector

in Kerala. It adds to the limited literature base on the effectiveness of online teaching systems among the tourism education stakeholders in Kerala. The exploratory factor analysis is employed to identify the important categories of factor critical for the success of online teaching in Kerala context. It reports three factors viz quality, physical infrastructure, and institutional responsibility. Confirmatory Factor Analysis was used to validate the instrument using AMOS. Four stage of Confirmatory Factor Analysis has completed. The Chi square is significant above the .01 level. Both the CFA and RMSEA appear quite good. Overall, the fit stats suggest that the estimated model reproduces the sample covariance matrix reasonably well. Further evidence suggests good construct validity. The instrument was found to be valid and reliable. It provides a reasonable good model fit and is suitable for further examination of the model result.

## REFERENCES

- Amin, M. A., & Al-Khasawneh, A., & Althunibat, A. (2020). Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. *Education and Information Technologies*. doi: <https://doi.org/10.1007/s10639-020-10219-y>
- Affouneh, S., Salha, S & Khlaif, Z. N. (2020). Designing quality e-learning environments for emergency remote teaching in coronavirus crisis. *Interdiscip J Virtual Learn Med Sci*, 2(2), 1-3.
- Basilaia, G., & Kvavadze, D. (2020). Replacing the classic learning form at universities as an immediate response to the COVID-19 virus infection in Georgia. *International Journal for Research in Applied Science & Engineering Technology*, 8(3), 101-108.
- Basilaia, G., & Kvavadze, D. (2020). Transition to Online Education in Schools during a SARS-CoV-2 Coronavirus (COVID-19) Pandemic in Georgia. *Pedagogical Research*, 5(4), em0060. <https://doi.org/10.29333/pr/7937>
- Bao, W. (2020). COVID-19 and online teaching in higher education: A case study of Peking University. *Hum Behav & Emerg Tech.*, 2, 113-115. doi:<https://doi.org/10.1002/hbe2.191>
- Dhawan, S. (2020). Online learning: A Panacea in the time of COVID-19 crisis. *Journal of Educational Technology System*, 49(1), 5-22.
- Fabrigar L. R., MacCallum R. C., Wegener D. T., & Strahan E. J. (1999). Evaluating the use of exploratory factor analysis in psychological research. *Psychological Methods*, 4(3), 272–299. doi:10.1037/1082-989X.4.3.272
- Field, A. (2009). *Discovering statistics using SPSS* (3rd ed.). London: SAGE Publications.
- Jadhav V. R., Bagul, T. D., & Aswale, S. R. (2020). COVID-19 era: Students' role to look at problems in education system during lockdown issues in Maharashtra, India. *International Journal of Research and Review*, 7(5), 328-331.
- Jha, N., & Shenoy, V. (2016). Digitization of Indian education process: A hope or hype. *IOSR Journal of Business and Management*, 18(10), 131-139.
- Hair, J. F. J., Anderson, R. E., Taham, R. I., & Black, W. L. (1998). *Multivariate data analysis with readings*. Englewood Cliffs, NJ: Prentice-Hall.
- Hyunho Kim et al (2016). Confirmatory and Exploratory Factor Analysis for Validating the Phlegm Pattern Questionnaire for Healthy Subjects. *Evid Based Complement Alternat Med*, doi: 10.1155/2016/2696019
- Kumar, A. A. and Srinivasan, R. (2020). Impact of Pandemic COVID-19 on the Teaching – Learning Process: A Study of Higher Education Teachers. *Prabandhan: Indian journal of management*, 13(4).
- Kumar, P. J. (2020). Impact of Covid-19 on higher education in India. *International Journal of Advanced Education and Research*, 5(3), 77-81.
- Martin, A. (2020). How to optimize online learning in the age of coronavirus (COVID-19): A 5-point guide for educators. Retrieved from [https://www.researchgate.net/publication/339944395\\_How\\_to\\_Optimize\\_Online\\_Learning\\_in\\_the\\_Age\\_of\\_Coronavirus\\_COVID-19\\_A\\_5-Point\\_Guide\\_for\\_Educators](https://www.researchgate.net/publication/339944395_How_to_Optimize_Online_Learning_in_the_Age_of_Coronavirus_COVID-19_A_5-Point_Guide_for_Educators)
- Murgatroid, S. (2020). COVID-19 and Online Learning. doi:10.13140/RG.2.2.31132.85120
- Neal, J. D., & Gurse, D. (2008). A multifaceted analysis of tourism satisfaction. *Journal of Travel Research*, 47(53).
- Nimina, R., & Sindhu, R. B. (2018). SWOT analysis of tourism higher education in Kerala. *Proceeding of International Conference on Sustainable Globalization*, 56-65. ISBN: 978-93-5279-203-0. Retrieved from <http://www.icsg.info/docs/ICSG-Proceedings-2018.pdf>
- Saxena, K. (2020). Coronavirus accelerates pace of digital education in India. EDII Institutional Repository.
- Salloum, S. A., Al-Emran, M., Shaalan, K., & Tarhini, A. (2019). Factors affecting the E-learning acceptance: A case study from UAE. *Education and Information Technologies*, 24(1), 509-530.
- Schermelleh-Engel, K., Moosbrugger, H., & Müller, H. (2003). Evaluating the fit of structural equation models: Tests of significance and descriptive goodness-of-fit measures. *Methods of Psychological Research Online*, 8(2), 23-74. Retrieved from <https://psycnet.apa.org/record/2003-08119-003>
- Schumacker, R. E., & Lomax, R. G. (2004). *A beginner's guide to structural equation modeling*. Mahwah, NJ: Lawrence Erlbaum Associates.

- Raj, U. (2020, May 10). Indian Education System in Fight against COVID-19 Pandemic. Retrieved from SSRN: <https://ssrn.com/abstract=3597340> or <http://dx.doi.org/10.2139/ssrn.3597340>
- Reyna, J., Hanham, J., Vlachopoulos, P., & Meier, P. C. (2019). Using factor analysis to validate a questionnaire to explore selfregulation in learner-generated digital media (LGDM) assignments in science education. *Australasian Journal of Educational Technology*, 35(5), 128-152.
- Tabachnick, B. G., & Fidell, L. S. (2007). *Using multivariate statistics*. Boston: Pearson Education Inc.
- Tabachnick, B. G., & Fidell, L. S. (2013). *Using multivariate statistics* (6th ed.). Boston: Pearson.
- Williams, B., Onsmann, A., Brown, T. (2010). Exploratory factor analysis: A five-step guide for novices. *Journal of Emergency Primary Health Care*, 8(3), 1-13.
- Taeho, Y., & Richardson, J. C. (2015). An exploratory factor analysis and reliability analysis of the student online learning readiness (SOLR) Instrument. *Online Learning*, 19(5), 120-141.
- All India Survey on Higher Education (AISHE). Retrieved July, 2020, from <http://aishe.nic.in/aishe/importantInstructionsPage>
- UNESCO. COVID-19 Education Response. Retrieved April, 2020, from <https://en.unesco.org/news/unescorallies-international-organizations-civil-society-and-private-sector-partners-broad>
- [https://www.mhrd.gov.in/sites/upload\\_files/mhrd/files/inc-cu\\_0.pdf](https://www.mhrd.gov.in/sites/upload_files/mhrd/files/inc-cu_0.pdf)
- UGC, 2020 <https://www.ugc.ac.in/oldpdf/Consolidated%20list%20of%20All%20Universities.pdf>
- <https://mhrd.gov.in/ict-initiatives>
- [https://www.mhrd.gov.in/sites/upload\\_files/mhrd/files/inc-cu\\_0.pdf](https://www.mhrd.gov.in/sites/upload_files/mhrd/files/inc-cu_0.pdf)
- [https://www.ugc.ac.in/pdfnews/4276446\\_UGC-Guidelines-on-Examinations-and-Academic-Calendar.pdf](https://www.ugc.ac.in/pdfnews/4276446_UGC-Guidelines-on-Examinations-and-Academic-Calendar.pdf)
- [https://www.ugc.ac.in/pdfnews/1573010\\_On-Line-Learning---ICT-initiatives-of-MHRD-and-UGC.pdf](https://www.ugc.ac.in/pdfnews/1573010_On-Line-Learning---ICT-initiatives-of-MHRD-and-UGC.pdf)
- [https://www.mhrd.gov.in/sites/upload\\_files/mhrd/files/inc-cu\\_0.pdf](https://www.mhrd.gov.in/sites/upload_files/mhrd/files/inc-cu_0.pdf)