



Indian Research Journal of Extension Education

ISSN: 0972-2181 (Print), 0976-1071 (e-Print)

NAAS Rating : 5.22

Journal homepage: seea.org.in



RESEARCH ARTICLE

https://doi.org/10.54986/irjee/2022/apr_jun/144-149

Suitable Strategy to Overcome the Barriers in Online Learning

CH. Ramya¹, V. Jyothi², and B. Vijayabhinandana³

1. PG. Scholar, 2. Asso. Prof. (Agril. Extn.), 3. Prof. & Univ. Head (Agril. Extn.), Agril. College, Bapatla, ANGRAU, A.P.

Corresponding author e-mail: v.jyothi@angrau.ac.in

Received on January 11, 2022, Accepted on March 20, 2022 and Published Online on April 01, 2022

ABSTRACT

As a consequence of COVID-19 pandemic, lockdown was imposed and sudden changes in the education system from traditional face to face to fully online mode. The objective of the study is to analyse the barriers faced by the students in online learning and verify with Confirmatory Factor Analysis and suggest a suitable strategy to overcome the barriers. The study was conducted at Acharya N G Ranga Agricultural University with 240 students who participated in online learning. The results revealed that greater proportion of the students often used smart phone (92.08%) for online learning. About 40.00 per cent of the students spent 19-28 hours per week in online classes. The study revealed nine barriers in online learning as perceived by the students namely unfavourable learning environment, lack of knowledge on effective use of online apps, lack of expertise and skills in using the apps, it is expensive, online learning is time consuming, internet connectivity issues, lack of uninterrupted power supply, problem with application compatibility with ICT tools and health issues. For barriers in online learning the goodness of fit of model indices were satisfactory. The factor loadings were greater than 0.40 and reliability of two factors technical barriers and personal barriers were 0.709 and 0.812 respectively. The strategies to overcome the barriers in online learning included the creation an organised study space, active participation of the students, eliminating distractions, etc.

Key words : Online learning; Internet connectivity; Uninterrupted power supply; Time spent; Barriers.

Traditional face to face classroom education is the most common system in India. But to control the spread of COVID-19 pandemic, lockdown was imposed which resulted in closure of educational institutions around the globe. In this uncertain situation, traditional classroom education was not possible. So, in order to continue the education process, universities have adopted online teaching. Online education is an alternative to traditional physical classroom. It was a challenge to both teachers and students to switch completely from traditional physical classroom to fully online teaching. Previously, very few people used to learn from online lectures, but now it has become a part of traditional education also. The educational institutes have to make every effort to strengthen and make online education productive. Our teaching and learning techniques have undergone a great change. Everything

is digitalized now, where teacher and students started meeting online on digital platforms for educational purpose. e-learning platforms were launched and they became popular over time. Digital learning puts the entire power in the hands of the students. They can control what they wish to study and when, that has led to better performance and results, thus strengthening the education system and its goals. E-learning connects the eminent academicians and learners from different parts of the world. Various institutes around the globe are utilising e-learning to educate and train their students and employees.

At this juncture a study was planned to find out the electronic tools and gadgets used for online learning by the students, the time spent in online learning using these devices and barriers in online learning as perceived by the students.

METHODOLOGY

The study was conducted in Acharya N G Ranga Agricultural University, Andhra Pradesh during 2020-21. Exploratory research design was used in the study. The A total of 240 students selected at random were interviewed for the study. Electronic devices used for online study, time spent in online learning and perceived barriers were study using online questionnaire developed for the study. Frequency and percentage were calculated. Barriers perceived by the respondents in online learning was graded using Garret ranking procedure as suggested by *Garret and Woodworth (1969)*; and followed by *Jyothi et al. (2020)*. Strategies to overcome the constraints were developed.

Confirmatory Factor Analysis (CFA) was conducted to verify the reliability of barriers. Indices namely., Goodness-of-fit index (GFI), adjusted goodness-of fit index (AGFI), normed fit index (NFI), Tucker-Lewis Index (TLI), comparative fit index (CFI), and root mean square error of approximation (RMSEA) were worked out. Exploratory Factor Analysis (EFA) was done and factors extracted were rotated by varimax rotation. The factors that obtained eigen values (total variance explained for each factor) greater than one was selected and interpreted in a table. Finally, the reliability of items in each factor was examined by Cronbach's 'α' The programs used for the confirmatory and exploratory analyses were SPSS AMOS and SPSS Statistics 28 respectively.

RESULTS AND DISCUSSION

It is evident from Table 1 that greater proportion of the students often used smart phone (92.08%) and rarely (7.92%) for online learning. Students also used laptop often (15.83%), followed by rarely (28.75%)

Table 1. Distribution of students according to their extent of use of electronic devices for online learning (N =240)

Category	Extent of use					
	Often		Rarely		Never	
	No.	%	No.	%	No.	%
Smart Phone	221	92.08	19	7.92	--	--
Laptop	38	15.83	69	28.75	133	55.42
Tablet	9	3.75	13	5.42	218	90.83
Personal Computer	7	2.92	23	9.58	210	87.50

and never (55.42%). A meagre proportion of them used tablet often (3.75%), followed by rarely (5.42%) and never (90.83%). A meagre proportion of them used personal computer often (2.92%), followed by rarely (9.58%) and never (87.50%). The results are in conformity with that reported by *Anil and Godara (2020)*; *Annu and Sisodia (2021)*.

Use of electronic devices corresponds to their possession and requirement. As smart phones are handy, they were often used by the students for social networking, internet surfing, etc. As per the requirement students used laptops also for preparation of thesis work, term paper presentations, seminar presentations, assignments, etc.

It is evident from Table 2 that 40.00 per cent of the students spent 19-28 hours per week in online classes, followed by 9-18 hours (25.00%), 29-38 hours (24.58%) and 39-48 hours (10.42%) per week.

Table 2. Distribution of students according to the time spent per week in online classes

Category (Hours)	No.	%
9-18	60	25.00
19-28	96	40.00
29-38	59	24.58
39-48	25	10.42

The time spent by the respondents in online learning firstly depends on the class timetable, internet connectivity and data balance. Classes are scheduled for a period of six hours in traditional class room teaching and the same time tables are followed for online classes also. The respondents are spending more time in online classes denotes sincerity in attending classes, interest, good internet connectivity and data balance. While the respondents spending less time for online classes denotes poor internet connectivity, less data balance and sometimes no interest in online classes.

The barriers reported by the students in online learning as presented in Table 3 are the lack of knowledge on effective use of online apps (Rank I), followed by internet connectivity issues (Rank II), problem with application compatibility with ICT tools (Rank III), lack of expertise and skills in using the apps (Rank IV), unfavourable learning environment (Rank V), online learning is time consuming (Rank VI), lack of uninterrupted power supply (Rank VII), health issues like eyes strain, body pains etc., (Rank VIII) and

Table 3. Distribution of students based on ranking of barriers using Garret Mean Score

Constraint	TGS	GMS	Rank
Unfavourable learning environment	12911	53.80	V
Lack of knowledge on effective use of online apps	13403	55.85	I
Lack of expertise and skills in using the apps	13097	54.57	II
It is expensive	9573	39.89	IX
Online learning is time consuming	12097	50.40	VI
Internet connectivity issues	12967	54.03	IV
Lack of uninterrupted Power Supply	11249	46.87	VII
Problem with application compatibility with ICT tools	13068	54.45	III
Health issues (Eye strained, body pains etc.,)	9712	40.47	VIII
*TGS=Total Garret Score GMS=Garret Mean Score			

expensive (Rank IX). The results are in conformity with that reported by *Wankhade et al. (2017)* and *Reddy and Chandawat (2021)*.

The administration should consider these problems and their priority to make online learning more interesting to the students.

Further Confirmatory Factor Analysis (CFA) was conducted to verify the reliability of barriers. For the exploratory factor analysis, Bartlett's sphericity test rejected the null hypothesis that the data correlation matrix was an identity matrix ($p < 0.001$), while Kaiser-Meyer-Olkin (KMO) was 0.805. These results show good fit of the data matrix to the factor analysis, indicating that the analysis of principal components could be performed.

The analysis of the principal components resulted in two factors that explained 47.54% of the total variance, while each presented eigen values greater than

1 (3.12 and 1.15) and explained 34.74% and 12.79% of the scale's variance, respectively. Table 4 presents the results of the exploratory factor analysis, considering the number of factors by factor loadings. The presentation of factor loads was made according to the order of the items in the factor.

The first factor technical barriers consisted of 6 items (C4, C5, C6, C7, C8 and C9). This particular factor explained 34.74% variance with eigen value 3.13 and thus forms an important factor regarding barriers in online learning, and the factor had been named as 'Technical factor'. The factor loading ranges from 0.414 to 0.743. This factor mainly represents the internet connectivity issues, problem with the application, lack of uninterrupted power supply, health issues, time consuming and expensive.

The second factor personal barriers consisted of 3 items (C1, C2 and C3). This particular factor explained

Table 4. Barriers in online learning as perceived by the students - Summary of factors

Factor Items	Label	Factor loading	Variance explained	Eigen values	Cronbach's alpha
<i>Factor 1: Technical barriers</i>					
Internet connectivity issues	C6	0.743	34.74	3.13	0.709
Problem with application	C8	0.664			
Lack of uninterrupted Power Supply	C7	0.662			
Health issues (Eye strained, body pains etc.,)	C9	0.586			
Time consuming	C5	0.414			
Expensive	C4	0.431			
<i>Factor 2: Personal barriers</i>					
Lack of expertise and skills in using the apps	C3	0.817	12.79	1.15	0.612
Lack of knowledge on effective use of online apps	C2	0.774			
Unfavourable learning environment	C1	0.465			

Table 5. Model fit indices for CFA for barriers in online learning as perceived by the students

Measure	CMIN (χ^2)	DF	p	CMIN/DF	GFI	AGFI	NNFI	CFI	SRMR	RMSEA	P Close
Estimate	48.964	26	0.004	1.883	0.955	0.922	0.876	0.936	0.056	0.061	0.23

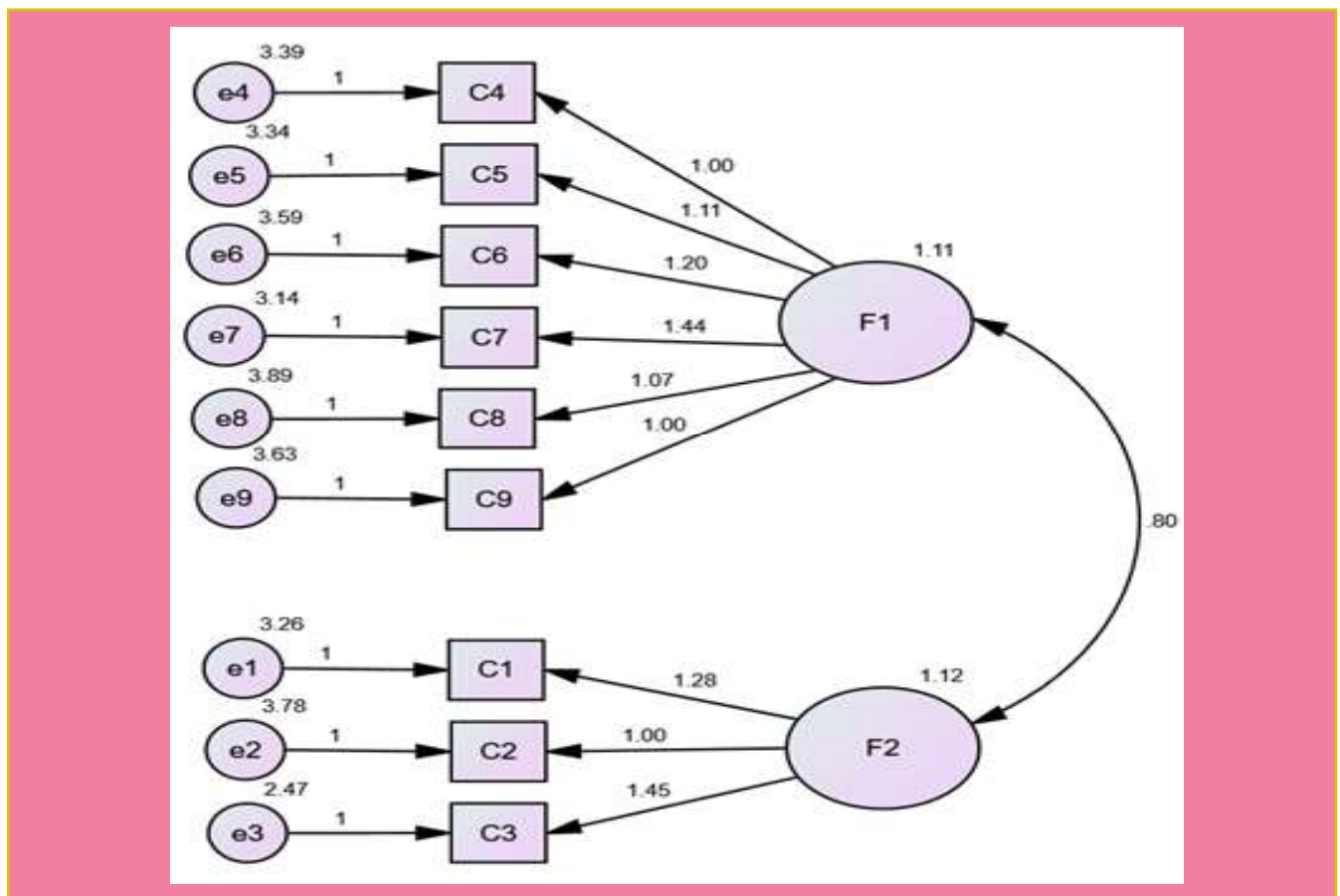
variance of 12.79% with eigen value 1.15 and thus forms an important factor in studying the barriers in online learning, and the factor had been named as ‘Individual factor’. The factor loading ranges from 0.465 to 0.817. This factor mainly represents the lack of expertise and skills in using the apps, lack of knowledge on effective use of online app and unfavourable learning environment.

Items with factor loadings of 0.5 and above (*Hair et al., 2010*) in the rotated component matrix were carried forward to the CFA stage. CFA was performed. Table 5 presents the model fit indices for CFA on barriers in online learning.

The overall fitting results were $\chi^2 = 48.964$; χ^2/DF

$= 1.883$, $p < 0.005$; $GFI = 0.955$; $AGFI = 0.922$; $NNFI = 0.876$; $CFI = 0.936$; $SRMR = 0.056$; $RMSEA = 0.061$; and $P\ close = 0.23$. These results show that all the criteria was acceptable and model fit is satisfactory based on adequacy criteria GFI , $AGFI$, CFI , RMR , $RMSEA$, $NNFI$ and $P\ close$.

In general, factor loadings should be equal to or greater than 0.707 for good convergent validity (*Gefen et al., 2000*). From the CFA result of this study, three loadings ($C2$, $C3$ and $C6$) are greater than 0.707 and two loadings ($C7$ and $C8$) are between 0.6 and 0.707. Four loadings ($C1$, $C4$, $C5$ and $C9$) are under 0.6. All items of factor 6 showed relatively low convergent validity. Low convergent validity means the items have information of



C1-C9: Constraint variables (observed variables); F1, F2: Factors (latent variables); e1-10: error variables;

Figure 1. Path diagram of Confirmatory Factor Analysis for barriers in online learning as perceived by the student

other factors rather than the corresponding factor alone.

The CFA is presented in path diagram where the circles represent latent variables and the squares represent observed variables. The single-headed arrows are used to imply an assumed direction of influence, and the two-headed arrows represent the covariance between the latent variables. Figure 1 shows the variances of the observed variables (C1 to C9), latent variables (Technical factor (F1) and Personal factor (F2)) as well as the co-variances between factors. The symbol represented by letter e, called error variables.

The results were in conformity with that reported by Rogers (2000) and identified barriers as being related to internal and external factors, and factors cutting across both areas. Internal barriers are related to the individual learner and encompass factors such as attitudes and level of technological competency. On the other hand, external barriers are related to a lack of availability and accessibility of technology, the quality of support, and insufficient development of skills for stakeholders in the use of learning technologies. Last, barriers that were reported to cut across both internal and external factors include a lack of time available, a lack of appropriate funding and a culture that resists adoption of learning technologies. Some of the items were also mentioned by Jyothi et al. (2011); Jyothi & Vijayabhinandana (2020 & 2021); Ramya et al. (2021). The results were also in conformity with that reported by Mulenberg and Berge (2005) who identified eight key factors that represent barriers to the uptake of online learning; administrative/instructor issues, social interaction, academic skills, technical skills, learner motivation, time and support for studies, cost and access to the Internet, and technical problems. The findings are in line with Becker et al., (2013) who extracted three key factors as barriers to e-learning. The first factor related to the nature of e-learning as a learning approach. The second factor relates specifically to the use of technology. The third factor relates to concerns about lack of time and potential interruptions when trying to complete e-learning.

C1-C9: Constraint variables (observed variables); F1, F2: Factors (latent variables); e1-10: error variables;
Strategies to overcome the constraints :

- i. *Creating an organised study space:* A better study space is very important as it helps to maintain concentration and maximise the learning efficiency.
- ii. *Time management:* Be prepared to join your online

class a few minutes before it starts so that you can make sure your audio and video are working or any network issues so that you can switch to other place.

- iii. *Eliminate distractions :* While attending the online classes in your gadgets like mobile, laptop, personal computer, the notifications from social media apps and other websites and calls may distract your attention so mute them.
- iv. *Maintaining notes:* Create a proper system for taking notes like it should cover the main concept of the lecture, provide space at one side and write down the queries and points to be discussed.
- v. *Recording the online lectures:* For few students, it may be difficult to take notes very fast and might miss few important points, then it is better to record the class and later check the points missed in your notes and it also improves retention of the subject.
- vi. *Active participation:* Participate in the group discussions, speak up interact with the teachers and students actively. If you have a question, ask for clarification.
- vii. *Take breaks :* Studying for long hours in online can exhaust the students and easily lead to frustration and health issues like strain on eyes, neck pain etc., It is important to take breaks to feel refresh and recharge yourself.
- viii. *Training on handling of virtual learning platforms:* Knowledge on handling the applications used in online education is important for effective learning.

CONCLUSION

Online education is an alternate to face to face education which has come to the rescue during pandemic and has now become a part of traditional education today. So, it has to be strengthened to make education interesting to the students. The barriers in online education can be overcome by adopting best management practices like creating an organised study space, active participation of students, eliminating distractions, recording the online lectures, maintaining good notes, taking breaks in between the classes, managing the time for all the works, intrinsic motivation and accountability in online classes.

CONFLICTS OF INTEREST

The authors declare that they have no conflicts of interest.

REFERENCES

- Anil, K. M. and Godara, A. K. (2020). Information and communication technologies (ICTs) use by the students of CCSHAU, Hisar. *Indian Res. J. Ext. Edu.*, **20** (4): 14-19
- Annu, D.G. and Sisodia, S.S. (2021). Utilization pattern of social media among the postgraduate students. *Indian Res. J. Ext. Edu.*, **21** (2&3) : 26-32
- Becker, K.; Newton, C. and Sawang, S. (2013). A learner perspective on barriers to e-learning. *Australian J. of Adult Learning*, **53** (2) : 211-233.
- Garret, H.E. and Woodworth, R.S. (1969). Statistics in psychology and education. Vakils, Fetter and Simons Pvt. Ltd., Bombay. Pp.329
- Gefen, D.; Straub. and Boudreau, M. C. (2000). Structural equation modelling and regression: guidelines for research practice. *Comm. of the Assoc. for Info. Systems*, **4** (1): 7.
- Hair, J.F.; Black, W.C.; Babin, B.J. and Anderson, R.E. (2010). Multivariate Data Analysis (7th ed.). New Jerson, Pearson Prentice Hall.
- Jyothi, V.; Subbaiah, P.V. and Vijayabhinandana, B. (2020). Preference ranking of agro advisory mobile messages sent in rice crop to farmers via e-group. *Indian Res. J. Ext. Edu.*, **20** (2&3) : 12-16
- Jyothi, V.; Vijayabhinandana, B. and Rao, A.V. (2011). Information and communication technology (ICT) utilisation pattern by the post-graduate students of Acharya N. G. Ranga Agricultural University. *The Andhra Agril. J.*, **58** (4) : 550-554.
- Jyothi, V. and Vijayabhinandana, B. (2020). Perception of students about online education. *The Andhra Agril. J.*, **67** (Spl. II): 142-143.
- Jyothi, V. and Vijayabhinandana, B. (2021). A scale to measure the attitude of students towards online learning. *Indian Res. J. Ext. Edu.*, **21**(2&3):37-42
- Ramya, Ch.; Jyothi, V.; Vijayabhinandana, B. and Prasad, P.V.N. (2021). Students attitude towards online learning in Acharya N.G. Ranga Agricultural University. *Indian Res. J. Ext. Edu.*, **21**(4):10-13
- Muilenburg, L. Y. and Berge, Z. L. (2005). Student barriers to online learning: a factor analytic study. *Distance Edu.*, **26** (1) : 29-48.
- Reddy, Y.S and Chandawat, M.S. (2021). Constraints and suggestions perceived by post graduate students to start agri-entrepreneurship. *Indian Res. J. Ext. Edu.*, **21** (4): 149-151
- Rogers, P.L. (2000). Barriers to adopting emerging technologies in education. *J. of Edul. Compu. Res.*, **22** (4) : 455-472.
- Wankhade, P.P.; Mankar, D.M.; Kale, N.M. and Shambharkar, Y.B. (2017). Use of information communication technologies in the post graduate students. *Indian Res. J. Ext. Edu.*, **17** (2):78-80.

