

Virtual Learning Subteleties And Coping With Stress Among University Students During Covid 19 Lockdown Period: A Structural Equation Model Approach.

Author's

Dr. C. Samuel Joseph^{1*}

Dr. H. Samuel Thavaraj²

Mr. Leo³

1. **Corresponding Author, Email: samueljoseph@karunya.edu, Professor and Head, Department of Management Studies & Commerce, Karunya Institute of Technology and Sciences, Deemed to be University, Coimbatore*

2. *Assistant Professor, Department of Rural Industries and Management, Gandhigram Rural Institute, Deemed to be University, Dindigul*

3. *Assistant Professor, Department of Commerce, Karunya Institute of Technology and Sciences, Deemed to be University, Coimbatore*

Abstract

Our research work examines the influence of online learning experience, taking students as an example, at a University where one of the authors is working. The students had been subjected to online learning for their respective courses which they have registered in their odd semester for the academic year 2019-20, through video lectures on account of COVID 19 and its subsequent announcement on Lockdown by the competent authorities in the Government of India. These students were circulated with the questionnaire through google forms as they were not available on campus. The Study focused on identifying the impact of online learning experience and factors contributing thereof and their ability to cope with stress due to this sudden outbreak. The authors' attempted to develop a model using Structural Equation Modelling, the results reveal that self-experience, professors support, perception towards online learning and adaptability attitude help students to the Cope up with their stress during this lockdown period. The results of the study will have wider impact on Higher educational institutions policy making and for execution in introducing more online based courses.

Keywords: *Online learning, Video lectures, Covid 19, lockdown, Structural equation model, coping with stress.*

1.0 Introduction

Collegiate education has changed tremendously these days. The regulatory bodies like NAAC, NBA, AICTE, UGC all issue circular after circular to integrate Information and Communication technologies (ICT's) into the curriculum particularly into the teaching and learning process. In University education ICT's should be a complement to teacher-controlled tuition on campus¹. Online learning is very popular in advanced countries, it implies learning by means of digital mediums, through live classes, video lectures etc., Educational services could be delivered and broaden using virtual classrooms⁶. Much in store for the teacher and the taught as they move to ICT based learning environment, which may include among other things promote collaborative learning¹⁷. Technology, created newer opportunities. The platform combines text, audio and video and offers means for both real-time communication and asynchronous interaction¹².

In last two decades online methodologies were developed to support on campus initiatives and distance education under computer-managed learning (Williams et al., 1999). It is quite important for the Professors and Teaching faculty to understand from the students' perspective and preferences towards taking classes over internet than in a traditional environment. The present study explores to identify the online experience stimulus and coping with stress during the COVID 19 lockdown period.

1.1 Problem Statement

Understanding students' preferences and their perceptions towards virtual learning in a University education set up is crucial to make a way forward in this direction. Their preferences and perceptions are influenced by very many variables which may be categorized into socio-economic demography, coping with stress, accessibility to internet, technology acceptance and besides their learning styles.

Students of 2K generation, pick up computer literacy well ahead during their schooling days itself. Mobile phones and laptops, I pad along with 4G and 5G data, add to their convenience to engage in technology with ease unlike their seniors belonging to 90's kids. Past literature further adds that preferences of men and women in using computers¹⁶. Individual students learning styles play a big role in adapting to new pedagogical learning situations, because of attitudes, skills and preferences of processing information, constructing meaning from it and applying it to new situations⁷. Hence the authors were motivated to take up a study among University students to know how would they react and adopt to virtual learning during this trying time of COVID 19 lockdown period in India.

1.2 Objectives

1. To identify the impact of virtual learning experience factors and coping with stress ability among the students.
2. To develop a model that can be used by all educational institutions to increase the coping with stress ability among the students with special reference to online learning during unexpected lock down period.

1.3 Review of Literature

The authors had reviewed critical reviews and the same is presented below:

(Harasim), found eight pedagogical practices for effective online teaching: fostering relationships, engagement, timeliness, communication, organization, technology, flexibility, and high expectations². (Ke.F.) addresses on specific instructional strategies that facilitate learner participation in small group projects, which result in an enhanced sense of community, increased skill acquisition, and better learning outcomes⁸. (Keengue & Kidd) found that primary reasons for the growth of e-learning in the nation's colleges and universities include the desire of those institutions to generate new revenue streams, improve access, and offer students greater scheduling flexibility⁹. (Kupczynski et.al) showed that while traditional students were satisfied both with convenience and quality, as expected, online students were unexpectedly not satisfied with convenience, but were satisfied with quality¹¹. Finally, (McAuly et.al) argues that building and sustaining prosperity through Canada's current digital strengths depends on a digital ecosystem that embraces both infrastructure and the collaborative social networks enabled by that infrastructure. By exploring the relationship of MOOCs to the digital economy in general and their potential roles to prepare citizens for participation in that digital economy in particular, it illustrates one particularly Canadian model of how these needs may be addressed¹⁴.

2.0 Research Methodology,

The study was performed at a University taking Students as sample. This University is one among the top 100 Universities ranked by National Institute of Ranking Framework (NIRF) of Government of India consecutively for the last three years. This University comprises three schools, viz., Engineering & Technology, Agriculture and Food Sciences and Sciences, Arts, Media and Management with a total strength of 8000 students.

The study was conducted among the Engineering, Arts, Commerce and Business Management Students, who belonged to undergraduate and post graduate levels. During the academic year 2019-20, by middle of

the odd semester, there came an epidemic COVID-19 in India, subsequently the University administration was subject to suspend all their in-person classes as per the directives of the Governmental authorities from the State and Central. Only at this point of time, the University geared up all their faculty members and switched on to virtual class room methods where the students will be supplemented by the Video lectures by their own subject teachers and regular interactive sessions were conducted through Google class room. Though the platform provided significant advantages not all of them were used by the teachers at large, but they were particular about giving assignments, Programmed Quizzes for assessments with shuffling options and pre-setting time limits, sending messages were the one's which was commonly used by the course teachers. Initially, the teachers created a Google class room and invited the students to join, once the students join the class, he or she is accessible to all study materials, power point presentations prepared by the teacher and their video lectures which they upload from time to time. For those students who have issues with their connectivity and network issues, these video lectures are also shared in the YouTube by the teacher to enable students to access at ease. Thus, every student who was part of this research study is covered under online learning environment and they are competent to respond to the questionnaire of the authors.

The study explores the impact of virtual learning experience and coping with stress using multiple regression analysis where coping with stress is taken as dependent variable and self-experience, professors support, perception, adaptability attitude was considered as independent variable. Further, the authors also developed a model using structural equation modelling.

2.1 Data Source

The authors have developed an instrument with the help of variables identified through the literature review. Survey research method was used for gathering the required data. The instrument was designed in such a way to capture the demographic variables, technology and prior exposure on virtual learning experiences of online course which are offered during the lockdown period starting March 2020. Further data on Self-experience, Professors support, Perception towards online learning, Adaptability attitude and Coping with stress were also elicited from the respondents. Online learning experience were measured with the help of 56 statements, where the students have the choice to answer under 5point scale.

2.2 Sample Size

The University where students were examined under this research has a total strength of 8000 active students during the period of research. The in-person classes for all these students were suspended because of the COVID-19 lockdown decision and they all are bound by this decision. Similarly, all of them were covered under this online learning initiative by their respective Professors. The instrument was shared to

selected courses that constitute 500 students (Population of the study) who represents from various branches of studies like Engineering, Business Management, Arts, Commerce and Science. Questions framed in Google forms were shared to them for responding. The Students spread included under graduate and post graduate levels. Further, the authors were mindful of collecting responses from male and female respondents. According to the sample calculation table developed by Krejcie and Morgan (1970), if the population is 500 to 550 the needed sample size of a randomly chosen sample from a given finite population could be 217 to 225. The sample table is published in the University of Connecticut for determining the sample size (<http://researchbasics.education.uconn.edu/sample-size/>). Out of those 225 students, after due editing and data cleaning process, 196 responses were found to be valid and used for further analysis. Thus, the authors were able to get a response rate of 87 percent.

3.0 Results and Discussions

3.1 Impact of Virtual Learning Experience and Coping with Stress among Students during the Covid-19 Lockdown Period

The impact of the virtual learning experience traits on Coping with Stress among the students were administered with the support of multiple regression analysis. The encompassed independent variables are self-experience, professors' support, perception towards virtual learning and adaptability attitude, whereas the coping with stress ability is taken as dependent variable. The built-in model is

$$Y = a + b_1X_1 + b_2X_2 + b_3X_3 + b_4X_4 + e$$

Whereas	Y	– Coping with stress ability
	X ₁	– Score on self-experience
	X ₂	– Score on professors support
	X ₃	– Score on perception towards online learning
	X ₄	– Score on adaptability attitude
	b ₁ , b ₂ , b ₃ , b ₄	– regression coefficients of independent variables
	a	– Intercept and
	e	– error term

The impact of virtual learning experience traits on the Coping with Stress among the students is examined. The resulted regression coefficients are shown in Table 1.

Table No. 1
Impact of Virtual Learning Experience Traits on Coping with Stress

Variables	Regression Coefficient	SE	t- value (d.f = 159)	R ²
(Constant)	0.36	0.20	1.78	.736
Self-Experience - X1	-0.02	0.04	-0.43	
Professors Support - X2	0.64	0.08	7.77**	
Perception Towards Virtual Learning - X3	0.21	0.09	2.30*	
Adaptability Attitude - X4	0.06	0.06	0.99	

Source: Computed

** - : Significant at 1 %

Table 2
Analysis of Variance for Regression

Source	S S	D F	M S	F
Regression	70.23	4	17.56	110.96**
Residual	25.16	159	0.16	

Source: Computed

** - Significant at 1 % level

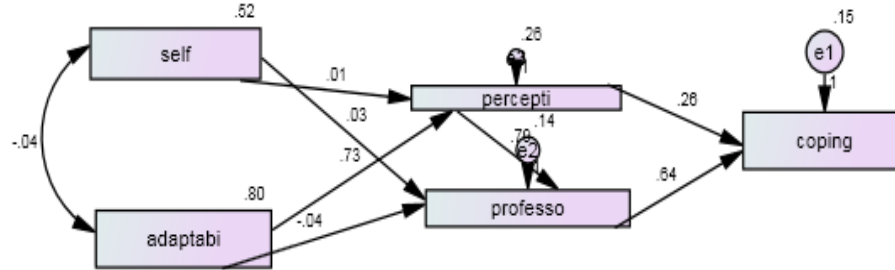
Regression Fitted: $Y = 0.36 - 0.02 X_1 + 0.64 X_2 + 0.21 X_3 + 0.06 X_4$

The Multiple regression model indicated that out of the explanatory variables under study all the factors towards virtual learning have significantly contributing to the Coping with Stress ability (Y) among the respondents. The analysis of variance of multiple regression model for Y specifies the overall influence of the model.

A unit increase in the above said virtual learning experience traits results in an increase in Coping with Stress ability by -0.02, 0.64, 0.21 and 0.06 units respectively. It also reveals that there is a significant positive impact of professor's support, perception towards virtual learning and adaptability attitude. The coefficient of determination R² value showed that these variables put together explained the variations of coping with stress ability (Y) to the extent of 73.6 per cent.

3.2 STRUCTURAL EQUATION MODEL FOR VIRTUAL LEARNING

Figure 1
Structure Equation Model for Virtual Learning



Whereas,

- self - Self-experience
- professo - Professors support
- percepti - Perception towards virtual learning
- adaptabi – Adaptability attitude
- coping - Coping with stress

The model includes the following variables (Group number 1)

The Observed, endogenous variables are perception towards virtual learning, professors' support and coping with stress. The Observed, exogenous variables are self-experience and adaptability attitude. The Unobserved, exogenous variables are e1, e2 and e3.

The SEM has a visual interface that has arrows and boxes. Boxes denote observed data and the arrows mean correlation is assumed. The variables in the model that obtain directional control in one way from any other variables in the system are considered "endogenous," or are independent. The values attached to one-way arrows (directional effect) are coefficient of regression when interpreting the model. Whereas two-way arrows (non-directional relation) are coefficient of correlation. The model parameters are indicated by the regression coefficients.

Table 3 presents uniform path coefficient, error variances, and critical ratio. The relationship between the factors and their respective indicators is important and is in the direction predicted. The Loadings of 0.71 and above are considered outstanding, loads of 0.63 to 0.70 are considered to be very good, loads of 0.55 to 0.62 are good, the loads from 0.45 to 0.54 are fair, the loads from 0.32 to 0.44 are low and the loads under 0.32 are poor¹⁵.

Table No. 3
REGRESSION WEIGHTS: (GROUP NO.1-DEFAULT MODEL)

Construct	Direction	Variable	Standard Estimate	Standard Error	Critical Ratio	P
-----------	-----------	----------	-------------------	----------------	----------------	---

Perception towards virtual learning	<---	self-experience	.006	.055	.114	.909
Perception towards virtual learning	<---	adaptability attitude	.729	.044	16.435	***
Professors support	<---	adaptability attitude	-.044	.054	-.828	.408
Professors support	<---	self-experience	.030	.041	.736	.462
Professors support	<---	perception towards virtual learning	.787	.058	<u>13.571</u>	***

The regression weight of virtual learning experience among students, perception towards online learning and professors support are significant at 1 per cent level. Hence it is concluded that virtual learning experience depends on Professors support and perception towards online learning among students.

Table No. 4

COVARIANCE :(GROUP 1-DEFAULT MODEL)

Construct	Direction	Variable	Estimate	S.E	CR	F
self-experience	<-->	adaptability attitude	-.037	.051	-.730	.465

It is clear that there is no significant covariance between self-experience and adaptability among students.

The model and its fitness index are as follows.

Table No 5

Comparing Default Model and Independence Model with Saturated Model (CMIN)

MODEL	NPAR	CMIN	DF	F	CMIN/DF
Default model	13	1.218	2	.544	.609
Saturated model	15	.000	0		
Independence model	5	591.640	10	.000	<u>59.164</u>

CMIN is a chi-square statistic that compares the default model and the independence model with the saturated model. Table 5, reveals that the default model has been associated to the extent of .609 per cent with saturated model and other hand, the independence model has been associated to the extent of 59.16 per cent with saturated model.

3.3 Root Mean Square Residual (RMR), Goodness of Fit (GIF)

The Root Mean Square residual indicates the mean absolute value of the covariance residuals, which in turn reflect the dissimilarity between observed and model estimated covariance. Explicitly, RMR indicates the coefficient that results from the square root of the mean of the squared residuals. The closer the RMR, the healthier the model fit. The GIF indicates the goodness of fit index and is equal to 0.997-(i.e the Chi-square of the default model / Chi-square of the null model).

Table No 6
Root Mean Square Residual (RMR), Goodness of Fit (GIF)

MODEL	RMR	GIF	AGIF	PGFI
Default model	.005	.997	.978	.133
Saturated model	.000	1.000		
Independence model	.310	.413	.120	.276

Table 6, indicates that the model is good fit by the effect of RMR value, which is less than 1, i.e., 0.005. GFI (Goodness of fit Index) refers to 97.8 per cent has been fitted in Default model for the proportion of variance-covariance matrix. It is also observed that, 41.3 per cent fit in independence model.

3.4 BASELINE COMPARISONS

The Normed fit index (NFI) was developed as the alternative to Comparative fit index (CIF), to compare the existing model with the null model which assumes the latent variables correlates with independent variables.

Table No. 7
BASELINE COMPARISONS

MODEL	NFI Delta1	RFI rho 1	IFI Delta 2	TLI rho 2	CFI
Default model	.998	.990	1.001	1.007	1.000
Saturated model	1.000		1.000		<u>1.000</u>
Independence model	.000	.000	.000	.000	.000

From table 7, it is noted that the model fit indices are good fit with the evidence of NIF (0.998) and CIF(1.000) which is equal to 1 level.

3.5 Root Mean Square Error of Approximation (RMSEA)

Root Mean Square Error of Approximation is the popular measure of fit since it does not necessitate comparison with the null model. It is one among the fit indexes less affect by sample size. There is good if RMSEA is less than or equal to 0.000.

Table No. 8
Root Mean Square Error of Approximation (RMSEA)

MODEL	RMSEA	LO 90	HI 90	PCLOSE
Default model	.000	.000	.134	.661
Independence model	.597	.557	.639	.000

It could be understood from the table 8, that the RMSEA value is 0.000 and the model resulted in good fit.

Table No. 9
MODEL FIT INDICES

S. No.	TEST FACTOR	VALUE	CRITERIA*	RESULT
1	GIF (Goodness of fit index)	0.997	>0.95	Good FIT
2	AGFI (Adjusted goodness of fit)	0.978	>0.95	Good FIT
3	CFI (Comparative fit index)	1.000	>0.95	Good FIT
4	NFI (Normed fit index)	0.998	>0.95	Good FIT
5	TLI (Tucker-Lewis index)	1.007	>0.95	Good FIT
6	RMSEA (Root mean square error of approximation)	0.000	<.07	Good FIT

*Criteria recommended by Schumacker & Lomax, (2004), Hu & Bender(1999), and Hair et al.,(1998)

The various collection of fit indices generated sustenance for the model. The model chi-square generated statistical significance, which leads to rejection of the null hypothesis that the structural model fits the data, GFI-.997, AGFI-.978, NFI-.998 and TLI-1.007, indicated adequate fit and the value of Root mean square error of approximation (RMSEA) is 0.000, indices that the model fits good.

3.6 Result

From the present research work it is revealed that the factors namely self-experience, professors support, perception towards virtual learning and adaptability attitude have significantly contributing to the Coping with Stress ability among the students during this lockdown period. It is also evident from the study that the factors namely perception towards virtual learning and professors support have significant influence on virtual learning experience during the covid-19 breakdown period among the students. In order to ensure effectively implementation of the virtual mode of learning for the students, the professors support play a

significant role towards influencing the students towards virtual learning, in addition the perception of the students also has an impact in order to increase the virtual learning experience among the students.

4.0 Summary of Findings

The analysis also reveals that there is a significant positive impact of professor's support, perception towards virtual learning and adaptability attitude. The R^2 value showed that these variables put together explained the variations of coping with stress ability (Y) to the extent of 73.6 per cent. The collection of fit indices yielded support for the model. While the model chi-square yielded statistical significance, which rejects the null hypothesis that the structural model fits the data, GFI-.997, AGFI-.978, NFI-.998 and TLI-1.007, showed adequate fit and the value of Root mean square error of approximation (RMSEA) is 0.000, indices that the model fits good. the factors namely self-experience, professors support, perception towards virtual learning and adaptability attitude have significantly contributing to the Coping with Stress ability among the students during this lockdown period.

5.0 Conclusion

The authors conclude by saying that, the strategy to switch over to technology-based teaching and learning for the students who were stranded by COVID 19 Lockdown period was a good decision by the University administration. The study reveals that students have positive attitude and favorably welcome the Professors support who came as a timely help to fill the gap in completing their lectures and that created a much greater confidence for them to sit for the end semester examinations. Further, SEM model reveals that self-experience, professors support and adaptability attitude factors significantly contribute to cope with stress of the students during this COVID-19 lockdown period. Therefore, we conclude that there is a greater scope for integrating virtual learning as a component of teaching and learning process in Universities to a greater extent as its liked by the student's community at large.

References

1. Clegg, S., Konrad, J Y Tan, J. (2000) Preparing academic staff to use ICT's in support of student learning, The International Journal for academic Development, 5, pp,138-148.
2. Harasim, L. (2000). Shift happens: Online education as a new paradigm in learning. Internet and Higher Education, 3, 41-61.
3. Hair, J., Anderson, R., Tatham, R.L., & Black, W.C. (1998). Multivariate data analysis, (5th ed.), NJ: Upper Saddle River, Prentice-Hall.

4. Hazemi, R & Hailes, S. Eds (2002) *The digital University – Building a learning community* (London, Springer).
5. Hu, L. T, & Bender, P. M. (1999). Cut off criteria for fit indexes in covariance structure analysis: Conventional criteria versus new alternatives. *Structural Equation Modeling*, 6, 1-55.
6. Husu, J. (2000) Access to Equal Opportunities: Building of a virtual classroom within two conventional school, *Journal of Educational Media*, 25, pp.217-228.
7. Jonassen, D.H & Crabowski, B.L (1993) *Handbook of Individual Differences. Learning & Instruction* (Hillsdale, NJ, Lawrence Erlbaum Associates.
8. Ke, F. (2010). Examining online teaching, cognitive, and social presence for adult students. *Computers & Education*, 55, 808-20.
9. Keengwe, J., & Kidd, T. T. (2010). Towards best practices in online learning and teaching in higher education. *MERLOT Journal of Online Learning and Teaching*, 6(2), 533-541.
10. Krejcie, R.V. & Morgan, D.W. (1970). Determining Sample Size for Research Activities, *Educational and Psychological Measurement*, 30, 607-610.
11. Kupczynski, L., Ice, P., Wiesenmayer, R., & McCluskey, F. (2010). Student perceptions of the relationship between indicators of teaching presence and success in online course. *Journal of Interactive Online Learning*, 9(1), 23-43.
12. Mason, R. (1998) *Globalising education. Trends and applications* (Routledge, London).
13. McAuley, A., Stewart, B., Siemens, G., & Cormier, D. (2010). The MOOC model for digital practice. Retrieved from http://www.elearnspace.org/Articles/MOOC_Final.pdf Mclsaac, M. S., & Gunawardena, C. N. (1996).
14. Schumacker, R.E., & Lomax, R.G. (2004). *A beginner's guide to structural equation modeling* (2nd ed.). Lawrence Erlbaum Associates Publishers.
15. Tabachnick, B. G., & Fidell, L. S. (1996). *Using Multivariate Statistics* (3rd ed.). New York: Harper Collins.
16. Venkatesh, V & Morris, M.G. (2000) Why don't men ever stop to ask for directions? Gender, social influence and their role in technology acceptance and usage behaviour, *MIS Quarterly*, 24, pp.115-139.
17. Wheeler, S. (2001) Information and Communication Technologies and the Changing Role of the Teacher, *Journal of Educational Media*, 26, pp.7-17.
18. Williams, M.L. Paprock, K & Covington, B. (1999) *Distance Learning. The essential guide*, Thousand Oaks, CA, (Sage Publications).
19. <http://researchbasics.education.uconn.edu/sample-size/>.