

Analysing the educational challenges during Covid-19 by using R-programming

J. Vennila^{1*}, P. Basker², K. Rajeswari³ and P. Nithyakala⁴

¹Department of Statistics, Kristu Jayanti College, Bengaluru, 560077, Karnataka, INDIA.
E-mail id: nilajagan92@gmail.com

²Department of Mathematics, Chandigarh University, Punjab – 140413. INDIA.
E-mail id: mcpdbasker@gmail.com

³Department of Statistics, Marudhar Kesari Jain College for Women, Vaniyambadi - 635 751.INDIA.
E-mail id: rajimrutthula@gmail.com

⁴Department of Pharmacy Practice, Swamy Vivekananda College of Pharmacy,
Namakkal – 637205. INDIA.
E-mail id: nithi29kala@gmail.com

ABSTRACT

In today's world, Education is considered one of the important fields. Especially during Covid-19's epidemic, it is necessary to explore online teaching learning. Institutions, Educators and Learners are unpredictably accepting the remote teaching learning. This research paper check the influence of remote teaching methodologies in the midst of the epidemic and find the feelings of Educators and Learners during the classes that are available online. Based on the research aim the questionnaire framed and distributed to Educators and Learners through Social Media. The data's were collected and classified with the help of Statistical Analysis using R-Programming the results were obtained. The Educators and Learners both were satisfied new modern teaching learning method.

Keywords: Educator, Learner,

Mathematics Subject Classification Number: 62P10, 62P20, 62P25

Journal of Economic Literature (JEL) Classification Number: A20, C10

1. INTRODUCTION

The infectious illness Covid-19 is caused by the most common Corona virus was recently found. These novel viruses and illnesses were discovered by accident. Unknown prior to In December 2019, there was an epidemic in Wuhan, China. The majority of persons who become ill with Covid-19 will have mild to moderate symptoms. The majority of persons who get sick with Covid-19 will have mild to severe symptoms. The first of Covid-19 in India which Originated from China was reported on 30 January 2020. Due to these rapid spreads, the government announced a lockdown to control the virus spreading. On 24 March 2020, the government of India ordered a National wide lockdown. The Educational systems were totally changed worldwide. All the Educational institutions are closed from March 2020 to now. The Higher Education System was found an alternative solution for this pandemic situation. They introduced online classes from Pre-KG to Higher Education. During this pandemic

period, many educational changes have created in India. Online classes are regularly conducted by Educational Institutions as per Government order. The Educators and the Learners both are learning new Technologies and they updated the modern technologies in day-to-day life. They are learning their Education in different platforms like Google Meet, Zoom, Cismo WebEx, Team, etc. Both educators and learners are unfamiliar with this style of teaching and learning.

The Educational systems were totally changed in worldwide. All the Educational institutions are closed from March 2020 to till now. The Higher Education System was found an alternative solution for this pandemic situation. They introduced online classes from Pre-KG to Higher Education. During this pandemic period, many educational changes have been created in India. Government-ordered online classes are held on a regular basis by educational institutions. Educators and learners are both learning new technologies and keeping up with modern technology in their daily lives. They are learning on various platforms such as Google Meet, Zoom, Cosmo Webex, Team, and others.

Tawafak et al.¹⁰ (2019) investigated how the UCOM E-learning system may improve student assessment. Baber¹ (2020) investigated the notion of online teaching-learning during the pandemic, examining student results and satisfaction levels. Khan et al. ⁴ (2020) looked at the effect of student satisfaction in online classrooms at the university level. Online-based practise teaching in higher education was planned by Lockman et al. ⁵ (2020). Mensink et al. ⁸ (2020) used online feedback to measure student access and degree of academic performance.

The influence of online lessons on students' performance during the pandemic time was discussed by Gopal et al. ² (2021). Maqableh et al. ⁶ (2021) investigated academic performance based on university students' factors. Through online classes, Martin⁷ (2021) has analysed student achievement in higher education as well as instructor attributes. The influence of online educational analysis in business foundation finance classes was investigated by Jeffrey et al. ³ (2021). Yunusa et al. ¹¹ (2021) used crucial predictive elements to examine satisfaction and perceived learning results in E-learning settings. Sandeep Grover et al. ⁹ (2021) anticipated the students' and parents' reactions to online education during pandemics.

The purpose of this research study report is to assess the impact of online classes, as well as technological knowledge, physical, and mental obstacles that develop throughout the pandemic. Focus on the advantages of online classrooms during the epidemic. Online class-related surveys were created and sent to instructors and students in Tamil Nadu. The data was collected and processed in Frequency Distribution format using R-Programming, and the Educators and Learners are considered two separate groups.

R is a programming language that is free to download and use for statistical computing and plotting. For creating Statistical Data Analysis, it is commonly utilised by statisticians and data miners. The management of large data analytics is one of the most significant applications of R-Programming.

The data was evaluated using R programming, and statistically significant differences between the Educators and Learners groups were discovered.

2. RESEARCH METHODOLOGY

Aim:

- To measure the impact of online classes during the COVID-19 pandemic period.

Objective:

- To evaluate the educator and learners knowledge and their feelings about online classes during COVID'19.
- To associate between the demographic data with mental, physical, and challenges online classes and demonstrate the efficacy of teaching and learning process during COVID'19.
- ✓ **Study Site:** The study was conducted by the Universities, Affiliated Colleges, Deemed Universities and Autonomous Colleges in around Tamil Nadu State during the period of 2020-2021.
- ✓ **Study Design:** This Research work is conducted based on cross-sectional survey.
- ✓ **Study Duration:** The research study was conducted for a period of one month.
- ✓ **Study Population and Sample:** The educator and learner of Tamil Nadu State is measured as the population. From the population, using statistical calculations, the sample size was determined to be 309 people. (Educator Group 1 - 51 / Learner Group 2 - 258).
- ✓ **Phase of Study:**
 - Phase I: Baseline period: Identify the sample size and randomization of respondents
 - Phase II: Circulating questionnaire to the respondent and collect the information through primary data format.
 - Phase III: Statistical analysis
 - Phase IV: Result and Discussion

2.1 Sources of data and Statistical analysis:

An online questionnaire was prepared through Google format and the link was circulated to educators and learners through Social Media. The educator and learners who come under sampling were contacted personally and collected the information. The survey questionnaire was prepared in a common format in English Language and separate questionnaires were prepared for educators and learners. The survey message made it apparent that respondents were free to choose whether or not to engage in the poll, and that participation indicated consent. The educator's and learner's socio-demographic profiles were examined using a survey questionnaire, with the age, gender, locality, educational qualification of the educator and learner. A self-designed questionnaire was used to determine the different sorts of online classes, the problems that come with them, various elements of online classes, and their influence. R programming's free version was used to examine the data. The results were analysed using descriptive and inferential statistic Frequency and percentages were

calculated for the discontinuous variables. Chi-square tests were analyzed using qualitative variables. A statistically significant difference between the two groups is defined as a value of $p < 0.05$.

2.2 Code of R-Programming

Basic Term

```
setwd("E:\\Sample csv files")
getwd()
table=read.csv("Work-Paper.csv")
table
subtab1=c(table$Age)
subtab1
library(plyr)
```

#Frequency Distribution for Age

```
f1=count(subtab1)
f1
class(f1)
f1$x
f1$freq
barplot(f1$freq)
barplot(f1$freq,names.arg=f1$x,main="Descriptive of Age group",col=c("Green","Red"))
```

#Frequency Distribution for Gender

```
subtab2=c(table$Gender)
subtab2
f2=count(subtab2)
f2
class(f2)
f2$x
f2$freq
barplot(f2$freq)
barplot(f2$freq,names.arg=f2$x,main=" Descriptive of Gender",col=c("Blue","Yellow"))
```

#Frequency Distribution for Educational Qualifications

```
subtab3=c(table$EducationalQualifications)
subtab3
f3=count(subtab2)
f3
class(f3)
f3$x
f3$freq
barplot(f3$freq)
barplot(f3$freq,names.arg=f3$x,main=" Descriptive of Educational Qualifications",col=c("Red","Green"))
```

#Frequency Distribution for Applications

```
subtab4=c(table$Application)
subtab4
f4=count(subtab4)
f4
class(f4)
f4$x
f4$freq
barplot(f4$freq)
```

```
barplot(f4$freq.names.arg=f4$x,main=" Descriptive of Applications are used for online  
classes ",col=c("Red","Blue"))
```

3. RESULT AND DISCUSSION

This study focuses mostly on the benefits of online (technical) education during a pandemic. It is classified into two main groups namely Educator group and Learner group. Online classes related questionnaires was prepared and distributed to respondents as per sample size calculation throughout registered colleges in Tamil Nadu. Totally 51 educators and 258 learners was enrolled in this investigation on educational challenging during COVID'19. The baseline value of both educator group and student group was comparable when it comes to age, gender, educational status, and online education related questions. The respondents are observed and their results were compared between educator group and learner group. Educators and students were encouraged to apply their expertise directly to online classroom instruction.

3.1 Age group

From the Table 1 spectacles that the study population the responders' highest range was under the age group of 35-40 years (27.45), the average range of the respondents were identified as 40-45 years (15.69) and low of the people that responded were identified 45-50 years (1.96) in the educator group and the highest range of the respondents were under the age group of 20-25 years (61.63), the average range of the respondents were identified as 25-30 years (35.27) and low of the people that responded were identified 35-more than 50 years (0) in the learner's group. The greater rate of educator answers was received, according to this data from under the age group 35-45 years and learner's of the people that responded were received from under the age group of 20-25 years. The chi-square test was applied to determine the relationship between educator and student based on the aforementioned evaluation (180.484). It is discovered that is smaller than the significant value ($p < 0.05$), implying that there is a statistical relationship between the educator and learner groups in terms of age.

3.2 Gender

Table 1 depicts the gender-wise classification of educator group with males 44(80.39%) and females 10 (19.61%) were as in learner group with males 51 (19.77%) and females 207(80.23%). In this research study result, both results are shows at a higher rate in females to compare males. From the above assessment, the chi-square test was applied to see if there was a relationship between educator and learner (10.006). It is observed that greater than the significant value ($p > 0.05$) & it is concluded that there is no association between the educator group and learners group in gender.

3.3 Educational Qualification

From Table 1 display that the educational status classification, it is observed that the majority of educator were completed their M.Phil degree and few teaching faculties are completed their doctoral degree were as in learner group with UG 198(76.74) and PG 57(22.09%). In this research study outcomes, both groups are shows at different education levels. From the above assessment, chi-square the test is a tool for determining the relationship between instructor and learner. (203.311). It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is an association between the educator group & learners group in educational qualification

Frequency Table for Socio-economic data					
Variables	Parameters	Educator Group Frequency (%)	Learner Group Frequency (%)	Chi Square Value	p value
Age Group	20-25	4 (7.84)	159 (61.63)	180.484	0.000*
	25-30	10 (19.61)	91 (35.27)		
	30-35	12 (23.53)	8 (3.10)		
	35-40	14 (27.45)	0 (0.00)		
	40-45	8 (15.69)	0 (0.00)		
	45-50	1 (1.96)	0 (0.00)		
	More than 50	2 (3.92)	0 (0.00)		
Gender	Male	10 (19.61)	51 (19.77)	0.0006	0.979
	Female	41 (80.39)	207 (80.23)		
Educational Status	UG	0 (0.00)	198 (76.74)	203.311	0.000*
	PG	15 (29.41)	57 (22.09)		
	M.Phil	26 (50.98)	3 (1.16)		
	Ph.D.	10 (19.61)	0 (0.00)		

Table 1. Descriptive and chi square analysis of educator group and learner group

3.4 Variables

In Table 2 demonstrations that the frequency values of the educator and learner. In terms of influence on the application of online education, these findings are unrelated to a survey conducted in Tamil Nadu, which stated that 47.06% of the educators and 29.07% of the learners were attending the online classes mostly by using Google meet, followed by Zoom meet (27.45% and 17.05), Google classroom (19.61% and 27.52), Cismo WebEx (5.88% and 22.87%) and others (0% and 3.49%). From the above assessment, the chi-square test is used and the result is 13.520. It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is an association between educators and learners using applications for attending the online classes.

Regarding the situation, impact on the environment punctuality, regularity, and sincerity for online classes, which described that 90.20% of the educator and 72.48% of the learners properly and regularly attending the online classes. From the result, The chi-square test is used to determine if there is a link between educator and learner (7.205), It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is a statistical association between educators sincerely and regularly conducting their online classes and learners are punctually attending their regular online classes.

In terms of impact on the disturbance during online classes, which reported that greatest 88.24% of the educator were faced disturbance during online classes owing to the network issues and 75.58% of the learners were not faced any disturbance while taking online classes. From the result, the chi-square test is used to determine if there is a link between educator and learner (76.277), It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is an association between educators and learners are facing disturbance for taking/attending online classes.

In expressions of the effect on the technical issues during online classes, which stated that the majority 94.12% of the educator and 60.85% of the learners not faced any technical issue while taking online classes. From the result, a chi-square test is used to find the association between educator and learner (21.102), It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is an association between educator and learners are not facing any technical issues for taking/attending online classes.

In positions of impact on the physical issues during online classes, which described that greatest 80.39% of the educator and 63.95% of the learners challenged physical issues while taking online classes. From the result, chi square test is used to find the association between educator and learner (5.178), It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is an association between educator and learners are challenged physical issue for taking/attending online classes.

In expressions of impact on the mental stress during online classes, which reported that majority 92.16% of the educator and 55.43% of the learners were not met any mental stress while taking online classes. From the result, chi square test is used to find the association between educator and learner (38.656), It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is an association between educators and learners are not met any mental stress for taking/attending online classes.

Frequency Table for Variables					
Variables	Parameters	Educator Group Frequency (%)	Learner Group Frequency (%)	Chi Square Value	p value
Applications are used for online classes	Google Meet	24 (47.06)	75 (29.07)	13.520	0.003*
	Zoom Meet	14 (27.45)	44 (17.05)		
	Google Class Room	10 (19.61)	71 (27.52)		
	Cismo Webex	3 (5.88)	59 (22.87)		
	Others	0 (0.00)	9 (3.49)		
Punctuality, Regularity and Sincerity for online classes	Yes	46 (90.20)	187 (72.48)	7.205	0.007*
	No	5 (9.80)	71 (27.52)		
Is there any disturbance during online classes?	Yes	45 (88.24)	63 (24.420)	76.277	0.000*
	No	6 (11.76)	195 (75.58)		
Is there any technical issues during online classes?	Yes	48 (94.12)	157 (60.85)	21.102	0.000*
	No	3 (5.88)	101 (39.15)		
Is there any physical issues by taking/attending online classes?	Yes	41 (80.39)	165 (63.95)	5.178	0.022*
	No	10 (19.61)	93 (36.05)		
Is there any mental stress by taking/attending online classes?	Yes	4 (7.84)	115 (44.57)	38.656	0.000*
	No	47 (92.16)	143 (55.43)		
Does the online classes satisfied for you?	Yes	31 (60.78)	177 (68.60)	1.183	0.276
	No	20 (39.22)	81 (31.40)		
Compared to offline classes, Are you comfortable for taking/attending online classes?	Yes	39 (76.47)	194 (75.19)	0.037	0.846
	No	12 (23.53)	64 (24.81)		
Are you feel happy to taking/attending the online classes at your home?	Yes	39 (76.47)	180 (69.77)	0.926	0.335
	No	12 (23.53)	78 (30.23)		
Is it easy to correcting/submitting tests, assignments and project works?	Yes	41 (80.39)	160 (62.02)	30.943	0.000*
	No	10 (19.61)	98 (37.98)		
Interaction during online classes	Yes	27 (52.94)	208 (80.62)	17.912	0.000*
	No	24 (47.06)	50 (19.38)		

Table 2. Descriptive and chi square analysis of educator group and learner group

Regarding the effect on the satisfaction level of during online classes, which stated that majority 60.78% of the educator and 68.60% of the learners satisfied to attend online classes. From the result, chi square test is used to find the association between educator and learner (1.183). It is observed that greater than the significant value ($p > 0.05$) and it is concluded that there is no association between educators and learners are satisfied to attend online classes.

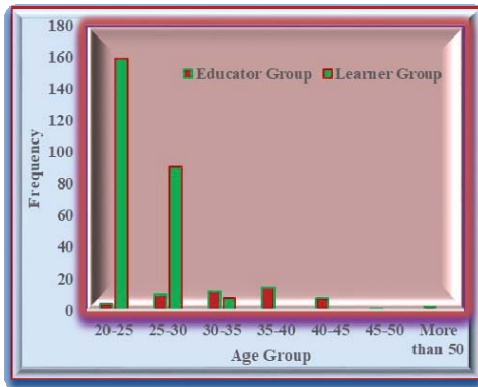


Figure 1: Descriptive of Age group

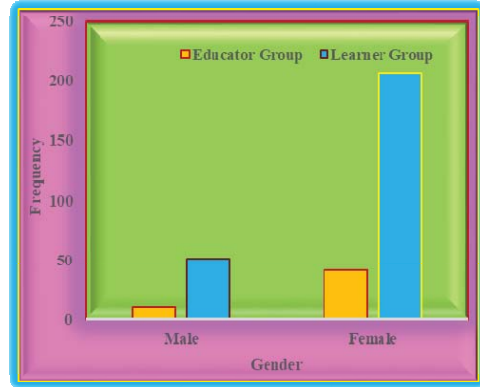


Figure 2: Descriptive of Gender

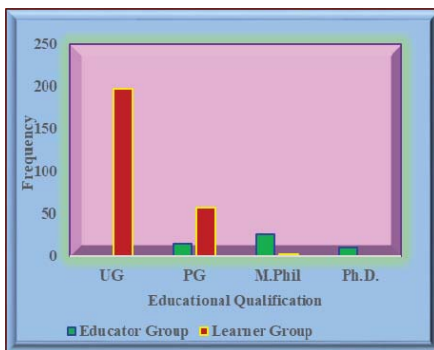


Figure 3: Descriptive of Educational Qualifications

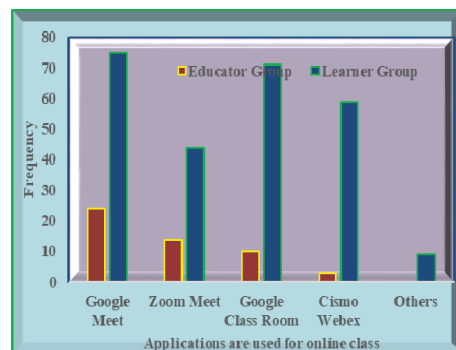


Figure 4: Descriptive of Applications are used for online classes

In terms of impact on the comparison between online and offline class, which described that majority 76.47% of the educator and 68.60% of the learners were said online and offline both are same. From the result, chi square test is used to find the association between educator and learner (0.037). It is observed that greater than the significant value ($p > 0.05$) and it is concluded that there is no association between online and offline classes.

Regarding the effect on the feeling of during online classes, which reported that majority 76.47% of the educator and 69.77% of the learners were very happy to attend online classes. From the result, chi square test is used to find the association between educator and learner (0.926). It is observed that greater than the significant value ($p > 0.05$) and it is concluded that there is no association between educator and learners are very happy to attend online classes.

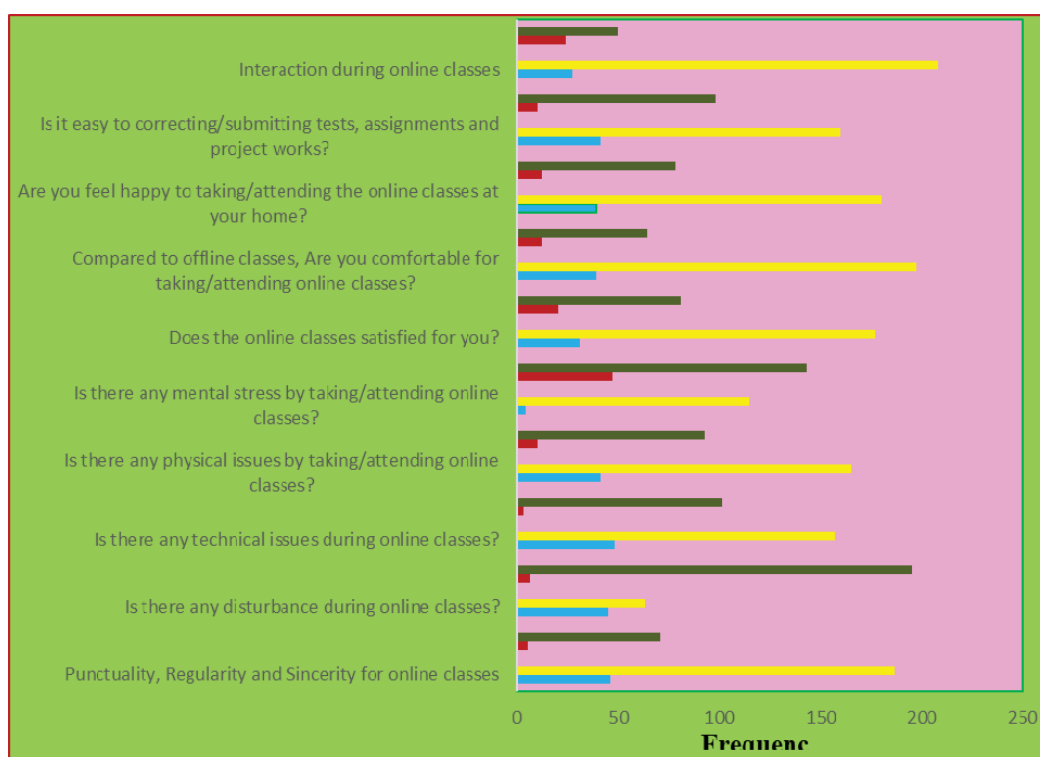


Figure 5: Descriptive of variables

In terms of impact on the correcting/submitting tests of during online classes, which stated that majority 80.39% of the educator and 62.02% of the learners were very happy to attend online classes. From the result, chi-square test is used to find the association between educator and learner (30.943), It is observed that less than the significant value ($p < 0.05$) & it is concluded that there is an association between educators and learners are correcting/submitting tests of during online classes.

Regarding the effect on Interaction during online classes, which described that majority 52.94% of the educator and 80.62% of the learners were very happy to attend online classes. From the result, the chi-square test is used to determine if there is a link between educator and learner (17.912), it is observed that ($p < 0.05$) there is a statistical association between educator and learners are interacting during online classes.

4. CONCLUSION

Online education is already well-known around the world. This study provided insights that may help in the move of successful online pedagogical approach that can profit the conventional for real classroom. The majority of educational organisations are beginning the alternative teaching and learning process, and many of them have developed their activities over the internet. As a result, there is a need to provide educators with enough technical expertise on how to conduct online

classes in order for them to be effective. The statistical relationship between educator and learner groups in terms of age, educational qualification, application use for online classes, truly and frequently conducting online lessons, learners attending their regular online classes on time, and facing disruption for taking/attending online classes is investigated in this study. There are no technological barriers to taking and attending online classes, and there are no physical barriers to taking and attending online classes. Neither of them has felt mentally strained as a result of taking/attending online programmes. This training technique aids learners in overcoming some of the difficulties that were associated with this procedure of learning environment and encouraging teaching practises that were changed to this context crucial to ensure that teaching learning processes were successfully leveraged. Finally the research paper is concluding that both Educators and Learners are adopted and highly satisfied to taking and attending online classes during this pandemic period.

5. REFERENCES

- Baber H, Determinants of Students' perceived outcome and satisfaction in online learning during the pandemic of COVID-19. *Journal of Education and e-Learning Research*, 2020; 7(3):285–292.
- Gopal R, Singh V & Aggarwal A, Impact of online classes on the satisfaction and performance of students during the pandemic period of COVID 19. *Educ Inf Tech*. 2021; <https://doi.org/10.1007/s10639-021-10523-1>
- Jeffrey S Jones, Kent P Ragan, Douglass Witte H, Jenny Zhang Y, The impact of online learning tools on student success in college of business core finance classes, *Journal of Education for Business*, 2021; DOI: [10.1080/08832323.2021.1932705](https://doi.org/10.1080/08832323.2021.1932705)
- Khan, N.U.S., & Yildiz Y, Impact of intangible characteristics of universities on student satisfaction, *Amazonia Investiga*. 2020; 9(26):105–116.
- Lockman A.S, Schirmer B.R. Online instruction in higher education: Promising, research-based, and evidence-based practices. *Journal of Education and e-Learning Research*, 2020;7(2):130–152.
- Maqableh M, Jaradat M, Exploring the determinants of students' academic performance at university level: The mediating role of internet usage continuance intention. *Education and Information Technologies*, 2021; <https://doi.org/10.1007/s10639-021-10453-y>.
- Martin A. M, Instructor qualities and student success in higher education online courses. *Journal of Digital Learning in Teacher Education*, 2021; 37(1):65–80.
- Mensink P J, King K, Student access of online feedback is modified by the availability of assessment marks, gender and academic performance. *British Journal of Educational Technology*, 2020;51(1):10–22.
- Sandeep Grover, Sandeep Kumar Goyal, Aseem Mehra, Swapnajeet Sahoo, Samta Goyal, Parents views about online classes during the ongoing COVID -19 pandemic: A web based cross sectional survey, *J. Indian Assoc. Child Adolesc. Ment. Health* 2021;17(3):127-142.
- Tawafak R M, Romli A B, Alsinani M, E-learning system of UCOM for improving student assessment feedback in Oman higher education. *Education and Information Technologies*, 2019;24(2):1311–1335.
- Yunusa A A, Umar I N, A scoping review of critical predictive factors (CPFs) of satisfaction and perceived learning outcomes in E-learning environments. *Education and Information Technologies*, 2021;26(1):1223–1270.