

## Dimensions of E-Learning and COVID-19: a Study on Students Pursuing Higher Education in Howrah district of West Bengal

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**ABSTRACT:** The entire world is passing through a harsh occasion due to the occurrence of COVID-19 and our country India is also relentlessly affected of the same. The education sector is also a victim in the sense to face difficulties in imparting knowledge to the students. On such a backdrop, we have tried to analyze the impact of COVID-19 on the students and whether the e-learning process is benefitting them or not. We have also tried to identify the potential platform of e-learning in providing classes to the students. We have further made an attempt to identify whether there is any interdependency between classes of reliability and gender, range of comfortability and gender, advancement in technology and gender, level of reciprocal communication and gender, examination and evaluation process and gender and level of financial background and gender along with interdependency between classes of reliability and area of residence, range of comfortability and area of residence, advancement in technology and area of residence, level of reciprocal communication and area of residence, examination and evaluation process and area of residence and level of financial background and area of residence in the district of Howrah in West Bengal. To complete our study, we collected 128 samples from the students' pursuing higher education in Howrah district using Google form keeping in view the presence of COVID-19. We used a 5 point Likert scale in a well-structured questionnaire and a convenient sampling technique to collect the same. Cronbach's alpha suggested reliability in scaling. A Shapiro-Wilk test suggested that the constructs are non-normal indicating performing non parametric test. We applied a Mann-Whitney test to judge the nature of dependency among the variables on the basis of gender and area of residence. We found that there is no dependency between the grouping variables (gender, area of residence) and the construct variables which supposes that e-learning

is a successful medium of learning among the students in Howrah district irrespective of their gender and the area of their residence from the viewpoint of reliability, comfortability, advancement in technology, reciprocal communication, examination and evaluation process and level of financial background.

**KEY WORDS:** COVID-19, Dimensions of e-learning, Reliability test, Shapiro-Wilk test, Mann-Whitney test.

### I. INTRODUCTION

COVID-19 has been originated in 31 December 2019 and since then it has spread widely to almost all the countries of the world where out of 13119239 confirmed cases as on 15 July, 2020 at 9.20 am, 573752 deaths have taken place as per World Health Organization (<https://covid19.who.int/>). The whole world is fighting against it with togetherness. As direct impacts of Covid-19 different sectors are mostly affected drastically in developed countries as well as developing countries like India are fighting another challenge at educational sector. Ultimate scenario in India that private colleges somehow moved with steps, but the Government and government aided colleges especially in rural area are suffered because of less number of facilities and are not able to cope up with situation. Despite all preventive measures taken at utmost care by all people in whole world, till now, there is no hope of ending the COVID-19 war. Thus, in the present paper an attempt has been made to evaluate the ease of e-learning among the higher education students in Howrah district of West Bengal.

E-learning has been introduced as a tool in the world wide learning process. This term is defined by any learning that involves using internet and intranet. E-Learning term has become very popular during Covid-19 Pandemic worldwide. It has grown in significance as an educational tool just like technology has developed and progressed

over the years. This pandemic situation has forced the educators and the different stakeholders to adopt this means in place of face to face learning. The 21st Century has seen the rapid progress with such things as the internet and online learning. E-learning has become an integral part of our daily life and advantages of this platform has attracted rather it can be said that habituated with all stakeholders. During the crisis, education through online mode is the only way to provide classes to students in order to compensate the loss whereas in past few years, the number of people using online educational platforms is increasing as well as anticipated to augment in future. (Kamra & Sahib, 2020)

The traditional set up of learning is evolving into a form mostly refer to as E-learning when the process of learning has been done with the advent of Computer technology and internet. E-learning is the term which is explained to a kind of instruction and learning System in which both party i.e. students and teachers do not need to meet physically but they can share informative information between them. Teachers and students are separated from each other's but this separation is connected with the help of Communication technology including the internet and other educational technical tools.

Now-a-days, Covid-19 has become a pandemic according to WHO, which has created a problematic situation in every sector, education sector is not an exception during this situation. To maintain the process of teaching learning, ICT has become more popular among the stakeholders of education Sector.

On the basis of involvement of E-learning Content, researchers can classify it into two major type's content;

**Complete Online learning** - This type of learning depends completely on tools of E-learning process. From providing notes, Course Material, discussion, examination and evaluation everything can be done through online mode. Flexibility regarding place and time of learning is maximum in this method of E-learning.

**Blended learning** - As the name suggests it is the mixture of face to face learning and E-learning. This kind of learning tool basically introduced to reduce face to face Contact time. (Gaur, 2015)

According to Keegan (2002), definition of distance education can be summarized as "teaching and learning in which learning normally occurs in a different place from teaching". He further describes that in distance education, materials and support structures are planned and prepared by an

educational organization which uses technical media to unite teacher, learner, and content. He also said the another angle of distance education when physical classroom teaching is next to impossible due to some personal and professional reason but in today's context distance education by using digital platform has become mandatory and quite obvious to protect all stakeholders from this pandemic attack. As per descriptions provided by Keegan regarding the distance education environment highlights various interacting components of distance education such as instructor, students, and content. Information and communication technology (ICT) makes interaction in this environment possible where every component plays a significant and crucial role in producing the expected outcome.

Online Assessment which becomes an integral part in today's situation is the use of digital technologies to create, distribute, assess and provide feedback for formative, summative, diagnostic or self-assessment. Technological developments and advancement with time to time have afforded new ways of assessing student learning and providing feedback. Online assessment is the process used to measure certain aspects of information for a set purpose where the assessment is delivered via a computer and other e-learning devices connected to a network. Most often the assessment is some type of educational test. Different types of online assessments contain elements of one or more of the following components, depending on the assessment's purpose: formative, diagnostic, or summative. (Keegan, 2002)

## II. LITERATURE SURVEY

Following research publications from national and international context has been minutely surveyed and some interesting outcomes have been exhibited here:

- **Kamra & Sahib (2020)** highlights the observation of students on online education and also emphasized on the development of students during the pandemic. They collected both primary and secondary data to analyze the merits and demerits of online education with a sample of 30 respondents from Punjab including both under graduate and post graduate students.
- **Raheem & Khan (2020)** demonstrated the implication of e-learning in COVID -19 disasters. The technology has been playing an immense role during the present crisis.
- **Allo, Markus. D. G. (2020)** inspected the sensitivity of the learners on e-learning during

COVID-19 pandemic. A semi-structured interview through whatsapp calling was performed to collect the data with a thematic analysis. The respondents stated the importance of e-learning during COVID-19 pandemic with stress on availability of internet access, financial issue and accomplishment of online learning. They suggested that voice note will be successfully used when giving instructions. It implied that the material and instruction executed by the lecturer in the online learning were not easy to use.

- **Bao, Wei (2020)** emphasized on Peking University in the context of online education. Six specific instructional strategies were implemented to sum up the present situation of online learning. The study concluded that there is significant relevance between online instructional design and learning of students, there is effective delivery on online instructional information, necessary support is provided by the faculty and the teaching assistant to the students, high participation in online education and emergency plan to deal with unexpected occurrence of online education platforms.

- **Murphy, Michael. P. A. (2020)** quarreled that in addition to COVID-19 being framed as a general hazard, face-to-face schooling was also represented as a hazard through these policies. Further, he stated that securitization theory is a significant device for educators not only for monitoring the happening of emergency eLearning but also for promoting the de-securitization of schooling after the COVID-19 emergency.

- **Pham et al. (2019)** inspects the associations among e-learning service quality attributes, overall e-learning, service quality, e-learning student satisfaction and e-learning student loyalty in the background of Vietnam. 1232 samples were collected from college students and analyzed through exploratory factor analysis, confirmatory factor analysis, and structural equation modeling using SPSS 25 and Smart PLS 3.0. The results point toward that e-learning service eminence was a second-order construct including three factors namely, e-learning system quality, e-learning instructor and quality of course materials and e-learning administrative and support service quality. E-learning service quality was positively related to e-learning satisfaction of the students.

- **Somayah et al. (2016)** in their review study examined the efficacy of e-learning in learning. The review study carried out using Medline and CINAHL databases and Google search engine including review articles and English meta-analysis of language. Results of studies recommend positive impact of e-learning on

learning and hence it is suggested that this approach be used more in education which requires building the required grounds.

### III. RESEARCH GAP

After minutely surveying the existing literatures, following gaps could be identified:

- No such works could be found on e-learning during the COVID-19 pandemic considering parameters like reliability, comfortability, technology, reciprocal communication, examination and evaluation and financial background
- Application of different econometric tools is rarely found
- Sample sizes in the existing works are too small and unrealistic
- Research work on any particular district extensively is rarely found

### IV. OBJECTIVES OF THE STUDY

On the basis of the research gaps, following objectives has been finalized for our study:

- To measure whether there is any impact of COVID-19 on students pursuing higher education at Howrah
- To measure the dominance of e-learning on students pursuing higher education at Howrah
- To identify the potential platform for providing e-learning to students pursuing higher education at Howrah during the COVID-19 pandemic
- To identify whether there is any interdependency between classes of reliability and gender, range of comfortability and gender, advancement in technology and gender, level of reciprocal communication and gender, examination and evaluation process and gender and level of financial background and gender
- To identify whether there is any interdependency between classes of reliability and area of residence, range of comfortability and area of residence, advancement in technology and area of residence, level of reciprocal communication and area of residence, examination and evaluation process and area of residence and level of financial background and area of residence

### V. RESEARCH METHODOLOGY

#### 5.1 Type of research

The study is purely primary in nature. Also, there exists a theoretical part by way of literature survey which is meant for identification of research gaps and deciding the objectives.

### 5.2 Population, Sample and Sampling Techniques

Based on the objective of our study, our population includes all the students pursuing higher education at Howrah district. Samples were collected through well-structured questionnaire using Google form from students from Howrah by Likert 5 point scale on the basis of convenient sampling technique keeping in view the present situation of COVID-19. In our study, we have ensured the representation of students from both rural and urban area to address the research hypothesis. The sample size was finalized at 128 after going through the data screening process and rejecting the incomplete responses.

### 5.3 Tools Used

On the basis of our objectives, following tools have been used:

- Charts
- Cronbach Alpha
- Shapiro-Wilk Test
- Mann-Whitney (U) test

To complete the analysis work, SPSS 20.0 was used.

## VI. RATIONALE OF THE STUDY

At this vital juncture, when the entire world is combating against COVID-19 and is trying to find a way-out from the same, this paper will enable the students, researchers, teachers and academicians with a new viewpoint to analyze the impact of COVID-19 on the students and how e-learning can emerge as an alternative medium against traditional learning to teaching – learning process. Even the potential platform of e-learning can also be identified and understood through this work. Additionally, this paper also looks to provide valuable insights in regard to the nature of dependency between different dimensions of e-learning from student’s viewpoint and their gender and area of residence.

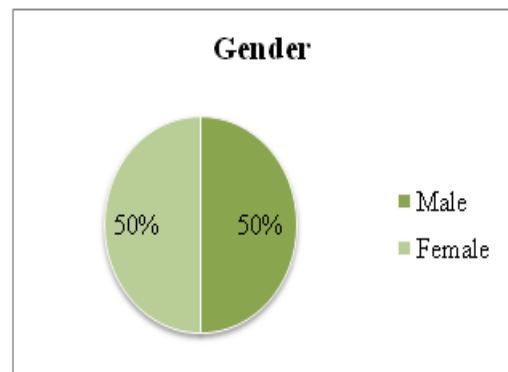
## VII. DATA ANALYSIS AND FINDINGS

This section deals with the different parameter that has been considered in our study. On the basis of the parameters, following constructs were prepared, reliability,

comfortability, technology, reciprocal communication, examination and evaluation and financial background. We have also tried to study certain other factors besides these constructs.

### 7.1 Demographic Data Analysis

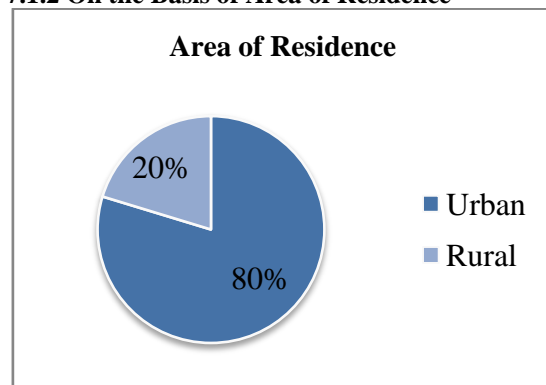
#### 7.1.1 On the Basis of Gender



Source: Computed from data collected through Primary Data

The above pie chart depicts the percentage of male and female respondents in our sample. Out of 128 respondents, 64 male and 64 female respondents are there.

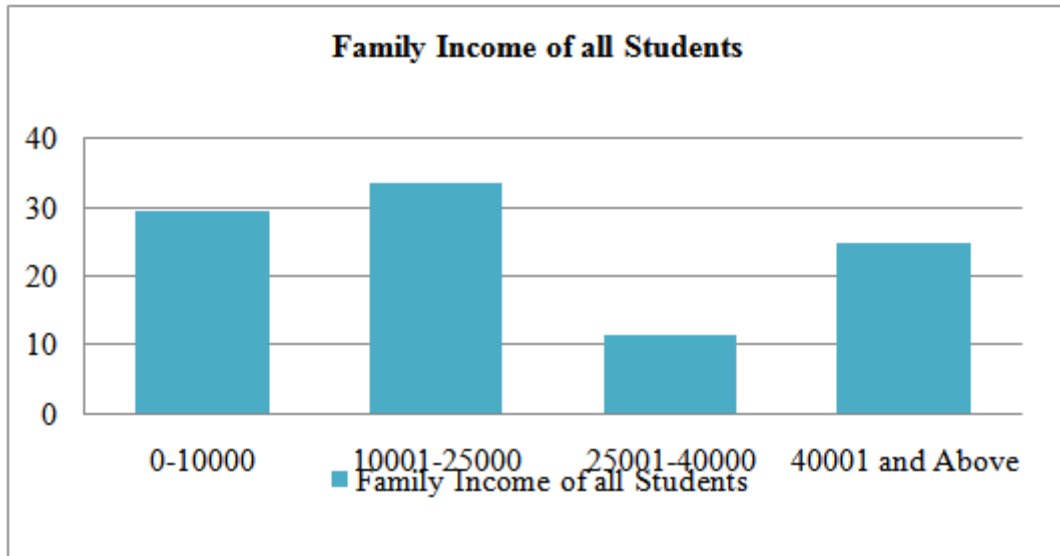
#### 7.1.2 On the Basis of Area of Residence



Source: Computed from data collected through Primary Data

The above pie chart depicts the percentage of respondents in our sample from rural and urban area. Out of 128 respondents, 102 are from urban area and 26 are from rural area.

### 7.1.3 On the Basis of Family Income

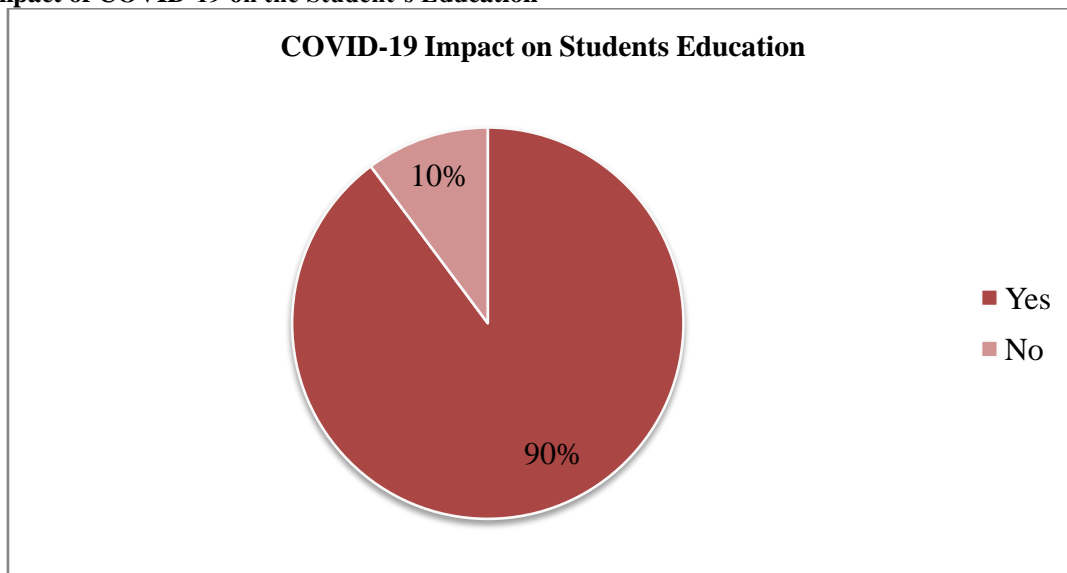


**Source:** Computed from data collected through Primary Data

The above bar chart depicts the percentage of respondents in our sample from different classes of family income. Out of 128 respondents, 38 are from family income between 0 to 10000, 43 are

from family income between 10001 to 25000, 15 are from family income between 25001 to 40000 and 32 are from family income of 40000 and above.

### 7.2 Impact of COVID-19 on the Student's Education

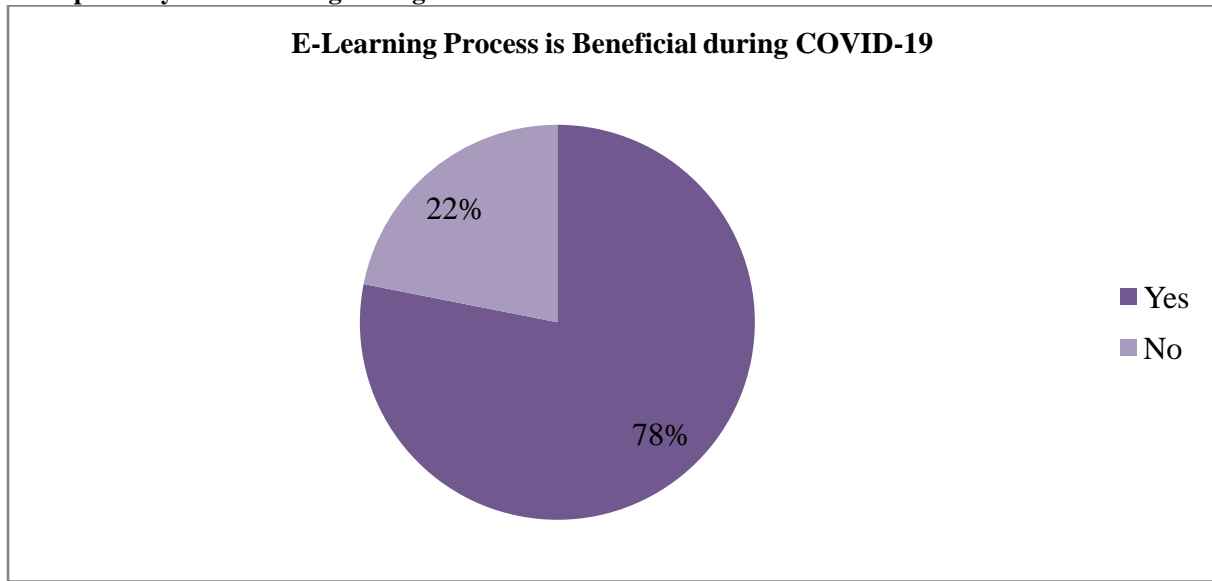


**Source:** Computed from data collected through Primary Data

The above pie chart clearly indicates that there exists a high impact of COVID-19 on the student's education in view of a 90 percent i.e., 115

respondents stating in favour of the impact and a 10 percent i.e., 13 respondents stating against the impact.

### 7.3 Superiority of E-Learning during COVID-19

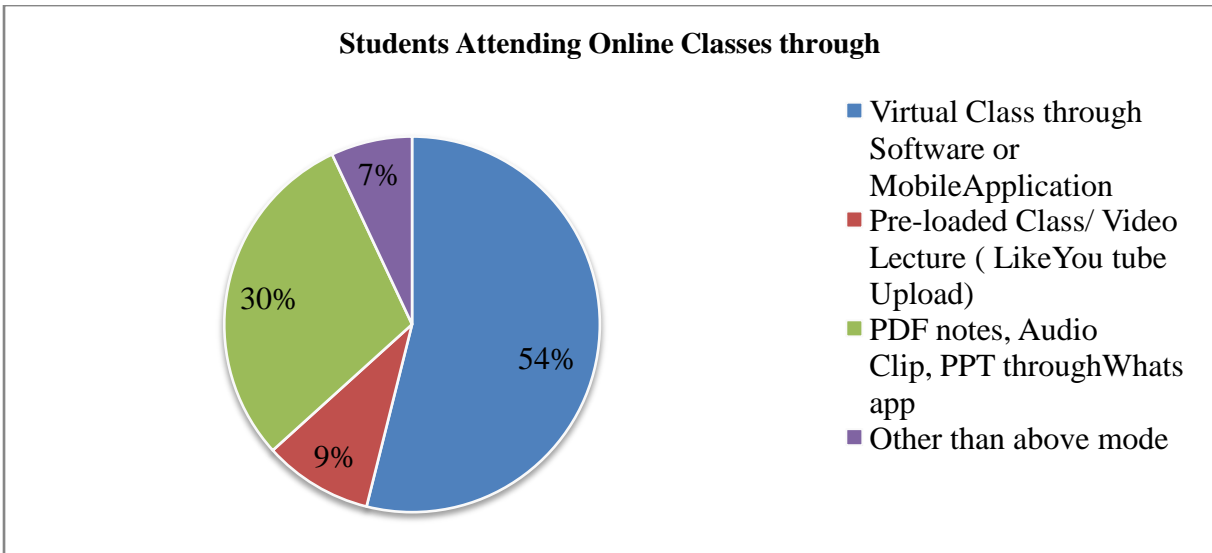


**Source:** Computed from data collected through Primary Data

The above pie chart clearly indicates that there exists a high benefit of E-learning on the student’s education in view of a 78 percent i.e., 100

respondents stating in favour of the benefit and a 22 percent i.e., 28 respondents stating against the benefit.

### 7.4 Potential Platform of Online Education



**Source:** Computed from data collected through Primary Data

The above pie chart depicts the percentage of student respondents participating in online mode of study through different platforms. It is observed that 54 percent i.e., 69 respondents from our sample participates through virtual class using software or mobile applications. 30 percent i.e., 38 respondents from our sample participates through pdf notes, audio clips, ppt files and through

whatsapp. 9 percent i.e., 12 respondents from our sample participates through pre-loaded class and or video lecture which includes YouTube. 7 percent i.e., 9 respondents from our sample participates through other mode. Hence, we may conclude based on our sample that virtual class consists a significant portion in providing online learning during the presence of COVID-19.

### 7.5 Scale Reliability Test

Reliability Statistics		
Constructs	Cronbach's Alpha	No. of Items
Reliability	0.638	4
Comfortability	0.695	4
Technology	0.591	4
Reciprocal Communication	0.775	4
Exam and Evaluation	0.709	3
Financial Background	0.741	3

Source: Computed through SPSS 20.0

The above table depicts the results of scale reliability test through Cronbach's Alpha. Cronbach's Alpha indicates the consistency in the scaling. We can see that reliability has a Cronbach's Alpha value of 0.638 which indicates that 63.8 percent of the variance in scores is reliable. Similarly, comfortability has a Cronbach's Alpha value of 0.695 which indicates that 69.5 percent of the variance in scores is reliable. Technology has a Cronbach's Alpha value of 0.591 which indicates that 59.1 percent of the variance in

scores is reliable. Reciprocal Communication has a Cronbach's Alpha value of 0.775 which indicates that 77.5 percent of the variance in scores is reliable. Exam and evaluation has a Cronbach's Alpha value of 0.709 which indicates that 70.9 percent of the variance in scores is reliable. Financial background has a Cronbach's Alpha value of 0.741 which indicates that 74.1 percent of the variance in scores is reliable. Hence, the overall result predicts that we can proceed with our study.

### 7.6 Normality Test

Shapiro-Wilk Test (1965)				
Constructs	Gender	Statistic	df	Sig.
Classes of Reliability	Male	0.836	64	0
	Female	0.829	64	0
Range of Comfortability	Male	0.854	64	0
	Female	0.848	64	0
Advancement in Technology	Male	0.812	64	0
	Female	0.773	64	0
Level of Reciprocal Communication	Male	0.848	64	0
	Female	0.836	64	0
Exam and Evaluation process	Male	0.859	64	0
	Female	0.859	64	0
Level of Financial Background	Male	0.833	64	0
	Female	0.779	64	0

Source: Computed through SPSS 20.0

The above table provides us with the results of normality test that is explained by Shapiro-Wilk test considering gender to be the factor. We find that all the constructs are non

normal in nature due to p value less than 0.05. Hence, we reject the null hypothesis and accept the alternate hypothesis that the construct variables are not at all normal.

Shapiro-Wilk Test (1965)				
Constructs	Area of Residence	Statistic	df	Sig.
Classes of Reliability	Urban	0.841	102	0
	Rural	0.788	26	0
Range of Comfortability	Urban	0.842	102	0
	Rural	0.799	26	0
Advancement in Technology	Urban	0.779	102	0
	Rural	0.855	26	0
Level of Reciprocal Communication	Urban	0.845	102	0
	Rural	0.808	26	0
Exam and Evaluation process	Urban	0.866	102	0
	Rural	0.79	26	0
Level of Financial Background	Urban	0.861	102	0
	Rural	0.863	26	0

Source: Computed through SPSS 20.0

The above table provides us with the results of normality test that is explained by Shapiro-Wilk test considering area of residence to be the factor. We find that all the constructs are non-normal in nature due to p value less than 0.05. Hence, we reject the null hypothesis and accept the alternate hypothesis that the construct variables are not at all normal.

### 7.7 Hypothesis Testing

Our study includes the following hypothesis:

1. Null Hypothesis ( $H_0$ ): There is no interdependency between classes of reliability and gender.
2. Null Hypothesis ( $H_0$ ): There is no interdependency between range of comfortability and gender.
3. Null Hypothesis ( $H_0$ ): There is no interdependency between advancement in technology and gender.
4. Null Hypothesis ( $H_0$ ): There is no interdependency between level of reciprocal communication and gender.
5. Null Hypothesis ( $H_0$ ): There is no interdependency between exam and evaluation process and gender.
6. Null Hypothesis ( $H_0$ ): There is no interdependency between level of financial background and gender.
7. Null Hypothesis ( $H_0$ ): There is no interdependency between classes of reliability and area of residence.
8. Null Hypothesis ( $H_0$ ): There is no interdependency between range of comfortability and area of residence.
9. Null Hypothesis ( $H_0$ ): There is no interdependency between advancement in technology and area of residence.
10. Null Hypothesis ( $H_0$ ): There is no interdependency between level of reciprocal communication and area of residence.
11. Null Hypothesis ( $H_0$ ): There is no interdependency between exam and evaluation process and area of residence.
12. Null Hypothesis ( $H_0$ ): There is no interdependency between level of financial background and area of residence.



Gender (Grouping Variable)	Classes of Reliability	Range of Comfortability	Advancement in Technology	Level of Reciprocal Communication	Exam and Evaluation Process	Level of Financial Background
Mann-Whitney U	1963.500	1990.500	1756.000	1914.000	1781.500	1900.000
Z	-.432	-.297	-1.603	-.688	-1.359	-.754
Asymp. Sig. (2 tailed)	.666	.766	.109	.492	.174	.451

Source: Computed through SPSS 20.0

The above table depicts the result of Mann-Whitney (U) test. This test indicates whether the two groups are interdependent or not. All the p values of the test are more than 0.05 indicating acceptance of null hypothesis and rejection of alternate hypothesis. Hence, we accept the null hypothesis of 1 to 6 and conclude that there is no interdependency between classes of reliability and gender, there is no interdependency between range

of comfortability and gender, there is no interdependency between advancement in technology and gender, there is no interdependency between level of reciprocal communication and gender, there is no interdependency between exam and evaluation process and gender and there is no interdependency between level of financial background and gender.

Area of Residence (Grouping Variable)	Classes of Reliability	Range of Comfortability	Advancement in Technology	Level of Reciprocal Communication	Exam and Evaluation process	Level of Financial Background
Mann-Whitney U	1292.000	1141.000	1120.500	1220.000	1178.500	1065.000
Z	-.216	-1.187	-1.402	-.676	-0.935	-1.653
Asymp. Sig. (2 tailed)	.829	.235	.161	.499	.350	.098

Source: Computed through SPSS 20.0

The above table depicts the result of Mann-Whitney (U) test. This test indicates whether the two groups are interdependent or not. All the p values of the test are more than 0.05 indicating acceptance of null hypothesis and rejection of alternate hypothesis. Hence, we accept the null hypothesis of 7 to 12 and conclude that there is no interdependency between classes of reliability and area of residence, there is no interdependency between range of comfortability and area of residence, there is no interdependency between advancement in technology and area of residence, there is no interdependency between level of reciprocal communication and area of residence, there is no interdependency between exam and evaluation process and area of residence and there is no interdependency between level of financial background and area of residence.

### VIII. LIMITATIONS OF THE STUDY

Our study is confined to Howrah district with 6 dimensions of e-learning from student's viewpoint. As the responses from rural area was comparatively less, a higher sample from rural segment of Howrah could have given a better result in regard to dependency between different dimensions of e-learning from student's viewpoint and their area of residence. Time constrain is also a factor to collect data from students and to prepare this paper.

### IX. FURTHER SCOPE OF RESEARCH

E-learning can also be measured through different other dimensions that has not been considered in our study. Hence, research work can be performed from the viewpoint of those dimensions. Works can also be performed at other districts and at state level. We can also perform

further research at national level also. Different other statistical tools and techniques can also be used to execute research in same area.

## X. CONCLUDING OBSERVATIONS

From the above analysis it is found that there is no dependency between classes of reliability and gender, range of comfortability and gender, advancement in technology and gender, level of reciprocal communication and gender, examination and evaluation process and gender and level of financial background and gender. Also, there is no dependency between classes of reliability and area of residence, range of comfortability and area of residence, advancement in technology and area of residence, level of reciprocal communication and area of residence, examination and evaluation process and area of residence and level of financial background and area of residence. This helps us to arrive at a conclusion that e-learning is a successful medium of learning among the students in Howrah district irrespective of their gender and the area of their residence from the viewpoint of reliability, comfortability, advancement in technology, reciprocal communication, examination and evaluation process and level of financial background.

## REFERENCES

### Papers

- [1]. Alo, M.D.G. (2020). Is the Online Learning good in the midst of COVID-19 Pandemic? The case of EFL Learners. *Journal Sinesthesia*, 10(1), 1-10.
- [2]. Bao, W. (2020). COVID-19 and Online Teaching in Higher Education: A Case Study of Peking University. *Hum Behav & Emerg Tech*, 2, 113-115.
- [3]. Gaur, P. (2015). Research Trends in E-Learning. *Media Communique NIU Journal of Media Studies*, 29-41.
- [4]. Kamra, H., & Sahib, M. (2020). A Study on the Perspective of Students regarding Online Education during COVID-19 Pandemic. *Purakala*, 31(42), 152-168.
- [5]. Keegan, D. (2002). The future of learning: From e-learning to m-learning. <https://eric.ed.gov/?id=ED472435>.
- [6]. Murphy, M.P.A. (2020). COVID-19 and Emergency E-Learning: Consequences of the securitization of higher education for post-pandemic pedagogy. *Contemporary Security Policy*, 41(3), 492-505.
- [7]. Pham, L., Limbu, Y.B., Bui, T.K., Nguyen, H.T., & Pham, H.T. (2019). Does e-learning

service quality influence e-learning student satisfaction and loyalty? Evidence from Vietnam. *International Journal of Educational Technology in Higher Education*, 16(7), 2-26.

- [8]. Raheem, B.R., & Khan, M.A. (2020). The Role of E-Learning in COVID-19 Crisis, *International Journal of Creative Research Thoughts*, 8(3), 3135-3138.
- [9]. Somayehm, M., Dehghani, M., Mozaffari, F., Ghasemnegad, S.M., Hakimi, H., & Samaneh, B. (2016). The effectiveness of E-learning in learning: A review of the literature. *International Journal of Medical Research & Health Sciences*, 5(2), 86-91.

### Books

- [10]. Das, J.K. (2018). *Statistics for Business Decisions*, 274-312.
- [11]. Kothari, C. R. (2004). *Research Methodology – Methods and Techniques*, 111-116.



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