

## EVOLVING HORIZONS

An Interdisciplinary International Journal of Education,  
Humanities, Social And Behavioral Sciences

(A Peer Reviewed Journal)

Volume 9 • November 2020 • ISSN : 2319 - 6521

---

# ONLINE EXAMINATION AS AN ALTERNATIVE OF PAPER BASED EXAMINATION: PROS AND CONS

Sanjib Kumar Gupta<sup>1</sup>

---

### Abstract

The Corona virus has uncovered rising vulnerabilities in the field of education around the globe. Considering the mounting worries about the spread of pandemic COVID-19, a large number of educational institutions have been forced to close down concerning face to face classes comprehensively. As a result, to cope with this unexpected situation schools, colleges and universities are moving increasingly more towards web based learning or e-learning. This shift in pedagogical medium is forcing academic institutions to rethink about the examination process as well. It has been observed the most of the examinations are cancelled recently in West Bengal as well as in India due to pandemic COVID-19. So, the online examination may be an alternative of paper based examination. This paper conducts a comparison between paper-based testing and online testing. Some selected students of undergraduate level from Sarsuna Colleges were given a paper based and two online examinations with the same standard of questions. There was a time gap of 15 days between the two online tests. Moodle learning management system (LMS) was used for conducting the online examination. The examinations were based on multiple choices (MCQ), fill in the blanks, short and descriptive type questions. Parametric and non- parametric tests are performed to compare the means and medians of the scores. The result shows that, however the average score of the first online test is significantly less than the paper based examination, but there is no significant difference between the second online test and the paper based test scores. This paper also illustrates the advantages and disadvantages of online examinations.

**KEYWORDS:** Online examination, Moodle, Parametric test, Nonparametric test, Higher education

---

1. Assistant Professor of Statistics, Sarsuna College, University of Calcutta Email: [gsanjib.stat@gmail.com](mailto:gsanjib.stat@gmail.com)

**INTRODUCTION**

At the present situation, the whole world is suffering from the pandemic COVID-19. The first corona patient was reported in December 2019 in Wuhan and it becomes a global public health issue. The number of infected persons and death due to the spread of COVID-19 are increasing

day after day in India. The exact medicine of the diseases is still not invented or is under clinical trial and thereby social distancing is one of the basic criteria to keep away from Coro-

na virus. Most of the countries are still also in the phase of lock down. The education system is also being affected badly by this pandemic. Educational institutions have been temporally closed around the globe. The closure of the educational institutes impacts on students, teachers and even guardians. UNESCO (2020) shows as on 25<sup>th</sup> June, 2020 there are 1,184,125,508 learners are affected world-wide. In India, 320,713,792 students are not able to go to their educational institute (World Bank, 2020). The following table indicates the closure status of educational institute in the wholeworld.

Table 1: Number of countries with closure status

Status	Fullyclosed	Closed in selected area	Seasonal closure	Open with limitations	Open	No information
No of Country	128	4	1	55	7	7

Source: World Bank Date as on 26/06/2020

The intervention of information communication technology (ICT) is thus useful in this situation. Many countries have adopted several ICT-based educations to continue the education. Different mobile application tools, various social Medias, artificial intelligence, Websites and dashboards etc. ICT tools are effectively used for this purpose. Information and Communication Technology or ICT is thus an integral part of modern education for the present unexpected situation. In last two decades its use has been significantly increased. ICT tools are important resource used for communication, creation, dissemination, storing and managing information. Michiels and Van Crowder

(2001) have defined ICTs as a scope of electronic technologies which when converged in new set up are adaptable, versatile, empowering and equipped for changing associations and rethinking social relations. These apparatuses empower the student’s inside and out turn of events and their full and dynamic support in the learning procedure. As per Ballew et al. (2015) ICT apparatus are making various open doors for helping information building, permitting administrators to coordinate a virtual world boundless by time and spot.

The key benefits of ICT in education are:

- It attracts students
- It enhances the quality of education
- It improves learning skill of students
- Some ICT tools are attractive
- Students can access from their own location
- Classes can be recorded
- It makes education more accessible
- It is a good tool for inclusive education
- It provides knowledge network to the students
- It promotes collaborative learning
- It produces a creative learning environment
- It helps to develop critical thinking

Only online class is not enough for any educational institute to carry on learning process. To promote students from one class to another it is also required to conduct examinations. School and college examinations are postponed at present due to the pandemic almost all over the world. Few students, teachers and guardians are also not satisfied to promote a student in the next class without any examination. As the days pass by with no quick answer for stop the incident of Covid-19, school, college and university may think of online examination an alternative of paper based examination. The institutes may utilize Moodle learning management system or some other available system for this examination purpose. The ad-

vantage of this tool is that teacher can upload assignments and student can answer those questions on computer or even mobile screen. Most of the answer of the questions is also automatically checked here. Thus it reduces time for a teacher to check answerscript.

Lloyd et al. (1996) mentioned that computer-based assessment saves time. Al-Qdah and Ababneh (2017) compared the online and paper-based examination. Male students from Computers and Information technology, and female students from arts background were selected for their study. Hosseini et al. (2014) also made a comparative study between online and paper based examination among English language learners in Iran. Kim and Huynh (2007) compared paper based mode with computer oriented assessment for Algebra and Biology. Al-Mashaqbeh and Al-Hamid (2010) depicted that students of Jordan were very much interested in online examination. Noyes and Garland (2008) showed that for objective based questions computer based examination is performing well. Jamil et al. (2012) collected the perceptions of University teachers. Woit and Mason (2003) discussed about the effectiveness of online assignments. Al-Amri (2007) pointed out whether the test administration mode matter or not.

In this paper different advantages and disadvantages of online examinations have been discussed. Then a comparative study between paper based and online examination is carried way based on the outcome of the experiment that I have conducted with my students. Perception of students on different aspects of online class is reported thereafter.

## ADVANTAGES AND DISADVANTAGES OF ON-LINE EXAMINATION

### Advantage

- It is paperless
  - It is time saving
  - It is environment friendly
  - Reduce cost of paper, transportation and logistics
  - It is secured. The chance of question paper leaking is less
  - It can be taken anytime
  - It is easy to access
  - Students can sit for examination from their convenient location
  - The records of examination can be stored and there is less risk to lose it
  - The result can be published quickly
  - Not required specific examination centre
  - It is reduced the number of supervisor
  - Easy to generate question paper
  - The answers can be checked from anywhere
  - Last minute changes of a question can be made
  - Result can be analyzed in a better way
- Dis-advantage
- Technological setbacks or glitches can disrupt. Complete dependence on technology is a hindrance

- Inadequate knowledge or training for the examination process may hamper
- Connectivity of internet is not very well in rural and backward areas
- It is slight difficult to write mathematical symbols and equations in computer and within time
- It is based on computer or mobile and that may create several problems at the time of examination
- If the number of students is large then it is difficult to invigilate at the time of examination
- There is a chance that student may cheat at the time of examination

## DATA COLLECTION AND METHODS

A paper based examination on Statistics subject was taken just 25 days before the lock down to the undergraduate students of Saruna College. The question paper consists of 5 multiple choices, 5 fill in the blank, 10 short and 5 descriptive questions. The answer script was checked and the marks were written in excel set. Due to lock down, the classes were taken online thereafter using Zoom, TeamLink and Google Meet. Study material was sent to students through Moodle LMS. An online test with same standard and same pattern of the paper based examination was taken at the end of April. I invigilated the students by Zoom. They submitted their answer through Moodle. The MCQ, fill in the blanks and short questions were automatically checked by the software. The answer documents were marked thereafter. A questionnaire was distributed after the completion of examination to all the students to gather information related to their experi-

ence and satisfaction of online class. Second online test was conducted in the 2<sup>nd</sup> week of May. The scores of the paper based and two online classes were compared. Again students are asked to fill a questionnaire with same questions to know whether the perception of the students about online examination is changed or not.

## RESULT

Pair sample t-test was adopted to test the mean difference of marks for paper and online - 1 test, online-1 and online-2 tests, and paper and online-2 test. The result is depicted in the table 1. SPSS software was used to perform the paired sample tests.

Table 1: Paired t-test for different combination of paper and online examinations.

### Paired Samples Test

		Paired Differences					
	Mean		Std. Deviation	Std. Error Mean	t	df	Sig. (2-tailed)
Pair1	Paper -Online1	9.52941	5.77838	1.40146	6.800	16	.000
Pair2	Online1-Online2	-8.94118	4.86660	1.18032	-7.575	16	.000
Pair3	Paper -Online2	.58824	2.37326	.57560	1.022	16	.322

The result shows that the average marks of paper based and online-1 and online- 1 and online-2 tests were not equivalent. The mean difference suggests that the average score of online-1 test was less than the paper based examination and the same for online-2 test is more than online-1. However, there is no significant difference in the score between the paper based and online-2 examinations.

Medians of the scores were also tested using Wilcoxon Signed rank test. The result is presented in the table 2. This table also suggested that there was no significant difference in median of the paper based and online-2 tests. However, there were difference in other two comparisons.

Table 2: Wilcoxon Signed rank test

**Test Statistics<sup>a</sup>**

	Online1 – Paper	Online2 - Online1	Online2 – Paper
Z	-3.625 <sup>b</sup>	-3.585 <sup>c</sup>	-1.002 <sup>b</sup>
Asymp. Sig. (2-tailed)	.000	.000	.316

Wilcoxon Signed Ranks Test

- a. Based on positive ranks.
- b. Based on negative ranks.

The perception and experience on online class are also recorded. The responses are depicted in the following table (Table 3)

Table 3: Perception of the students on online class

S.N.	Statement	After online-1 examination		After online-2 examination	
		Agree(%)	Disagree(%)	Agree(%)	Disagree(%)
1.	Online and paper based	36	64	48	52

	examinations are equivalent				
2	I prefer online examination more than paper based	24	76	42	58
3	It is difficult to write the symbols and equations in online examination	82	18	60	40
4	Online examination saves time	48	52	54	46

5	Online examinations are more hassle free	42	58	54	46
6	Online examinations are less stressful	36	64	48	52
7	Online examinations are eco- friendly	60	40	66	34
8	I want to give some online examination in post covid-19 period also	30	70	60	40

The above table illustrates that initially students were not happy with the online examination. They were also not comfortable with online system. But once they were habituated with online class and examination, most of them preferred online examination.

#### **CONCLUSION**

It was evident from the study that if the questions are of equal standard then the online and offline tests are equivalent if students practice online examination. So they need some training before final examination in online mode. Also teacher should know the online examination procedure very well. Since the test is based on computer/mobile and internet, the infrastructure for the students at their home or institution must be good one.

## REFERENCES

- Al-Amri, S (2007). Computer-based vs. Paper-based testing: does the test administration mode matter? Proceeding of the BAAL conference. 101-10.
- Al-Mashaqbeh, I.F, & Al-Hamad, A. (2010). Student's perception of an online exam within the decision support system course at Alal Bayt University, |Conference Publication, May 7-10, 131-35.
- Ballew, M. T., Omoto, A. M., and Winter, P. L. (2015). Using Web 2.0 and social media technologies to foster pro environmental action. Sustainability, 7, 10620-48.
- Bodmann, S.M., & Robinson, D.H. (2004). Speed and performance differences among computer-based and paper-pencil tests," *Journal of Educational Computing Research*, 31(1), 51-60.
- Hosseini, M, Abidin, M.J.Z, & Baghdarnia, M. (2014). Comparability of test result of computer based tests (CBT) and paper and pencil tests (PPT) among English language learners in Iran. *Procedia - Social and Behavioral Sciences*, 98 , 659 – 667
- Jamil, M., Tariq, R.U.L., & Shami, P.A. (2012). Computer-based vs. Paper-based examinations: Perception of university teachers. *Turkish online Journal of Educational Technology*, 11(4), 371- 81.
- Kim, D. H., & Huynh, H. (2007). Comparability of computer and paper-and-pencil versions of Algebra and Biology assessments. *Journal of Technology, Learning, and Assessment*, 6(4), 1-35.
- Lloyd, D., Martin, J. G. & McCaffery, K. (1996). The introduction of computer-based testing on an engineering technology course. *Assessment and Evaluation in Higher Education*, 21(1), 83- 91.
- Michiels, S.I. & Van Crowder, L. (2001) Discovering the 'magic box': local appropriation of information and communication technologies (ICTs). SDRE, FAO, Rome
- Noyes, J.M., and Garland, K. J (2008). Computer- vs. paper-based tasks: Are they equivalent? *Ergonomics*. 51 (9), 1352-75
- Woit, D. and Mason, D. (2003). Effectiveness of online assessment. Proc. SIGCSE 2003: 34th Annual Technical Symposium on Computer Science Education.
- UNESCO (2020) <https://en.unesco.org/covid19/educationresponse>
- World Bank (2020) <https://www.worldbank.org/en/who-we-are/news/coronavirus-covid19>