

## HIGHER EDUCATION STUDENT'S OUTLOOK TOWARDS ONLINE ASSESSMENT: A MULTIVARIATE ANALYSIS

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### ABSTRACT

In the present study an attempt has been made to identify the outlook of students who are pursuing undergraduate and post-graduate programs towards the continuous and term end assessment, appeared for online evaluation. The aim is to understand the outlook of students from different domains on the effectiveness of the online assessment.

Besides secondary data, the primary has been collected through a self-administered questionnaire with close ended questions. The respondents were the students who have been assessed through online mode in continuous as well and term end examinations of graduate and post-graduation programs. The single cross sectional descriptive research design has been used. For reliability and data analysis Cronbach's Alpha, Chi-square test and MANOVA have been used. In this study it is found that there is a significant difference in the outlook of students of different degree programs, about online assessments. They differ in their outlook about online assessment being effective in all subjects, give opportunity to use unfair means, not results in feeling of having command over the knowledge of the subjects after examination and anxiety issues about proper working of digital infrastructure before examination.

**Keywords:** Online assessment, Effectiveness, Higher Education

### INTRODUCTION

The COVID-19 pandemic has brought radical changes in the education system worldwide. The commotion in education system has impacted over 90% of the student population of the world (UNESCO, 2020). The education systems in pandemic affected countries' have adopted the virtual live sessions or Massive Open Online Course (MOOC)-styled ones, to handle this unusual situation.

Platforms such as Google Classroom, Blackboard, Zoom, and Microsoft Teams used are widely used to enhance student education and learning

This disruption in the education industry due to pandemic has become noticeable due to the sudden, need for learners to shift to virtual learning during this period. The academic assessments have been done through online mode, on an untested and unprecedented scale with the limited infrastructure.

Amidst COVID-19, online learning is beginning to take root as part of the educational environment, especially in higher education and skills development, and certificate programs.

Many educational institutions have started using e-learning platforms to impart education to their students. In this study an attempt has been made to understand the effectiveness of online mode of assessment in various degree programs.

It is realized that there is need to assess the effectiveness of this mode of online assessment in case of different degree programs in various faculties like Science, Arts/Humanities and Commerce and Management, as online assessment has emerged as the most feasible option to evaluate the learning levels of the students.

This abrupt migration from traditional education system to online learning has created disruptions in the life of students, staff, and faculty members. The educational institutions continued imparting education to the students by conducting online sessions. The required changes were made which included more flexibility with deadlines for assignments and pattern of examination and structure of question papers. Colleges offering various degree programs such as B.Sc., B. Com, BBA or Law etc., had no option and had to conduct online examination. The students appeared for objective type of examination, irrespective of the nature of the subject. During COVID-19 the institutions offering higher education had to deal with some complex and unique challenges where they to find ways to deal with practical examination and laboratory-based assessments.

## REVIEW OF LITERATURE

The COVID-19(Corona Virus Disease 2019), pandemic has created crisis all over the world and derailed our social, political, economic, religious and financial structure. The tradition education set up faced substantial disruptions, as a result the education institutions were forced to use virtual classes/e-learning for the continuance of learning of the students. The E-learning emerged as life saver for the higher education institutions, which opted for online sessions for the timely completion of the syllabus as well as for conducting online assessment to validate the learning levels of the students.

Buchanan, T. (2002) have studied the possible uses of worldwide based tests and found that though the online assessments are very important but not unproblematic. They concluded that evidence exist that Web-based versions of tests may not always measure the same constructs as their traditional antecedents: equivalence cannot be assumed.

Denise Woit and David Mason (2003) studied the effectiveness of online assessment of student programming abilities for introductory programming courses in Computer Science. They found that online evaluation can be implemented securely, efficiently, and can result in increased student motivation and programming efficacy; however, unless online components are integrated throughout the course evaluations, student competence will be underestimated. Our data reveals disadvantages of online evaluations, but also shows that both students and faculty benefit when online evaluations are implemented appropriately.

M. Yasar Özden (2004) in his study investigated students' perceptions of the use of computer-assisted assessment (CAA) and the potential for using student feedback in the validation of assessment. For the study web site was developed and implemented as part of the assessment of Masaüstü Yayıncılık (Desktop Publishing), a course given by the Department of Computer Science at Kocaeli University, Turkey. It was concluded that the most prominent features of the online assessment system were immediate feedback, randomized question order, item analysis of the questions, and obtaining the scores.

Bopelo Boitshwarelo, Alison Kay Reedy and Trevor Billany (2017), studied the literature to explore the role of online tests in higher education, particularly their relationship to student learning in a digital and changing world, and the issues and challenges they present. They concluded that online tests, when used effectively, can be valuable in the assessment of twenty-first century learning and they synthesized the literature to extract principles for the optimization of online tests in a digital age.

González-González, C. S., Infante-Moro, A., & Infante-Moro, J. C. (2021) in their study said that although, there are already e-proctoring tools (electronic proctoring) that allow this process to be carried out remotely, without requiring that physical presence. Their paper focused on a bibliographic and a causal study carried out by experts in online teaching, focused on locating the determining motivational factors when accepting and implementing this evaluation system as a method of remote supervision and tries to encourage its use through them. The list obtained consists of the following motivational factors: Quality management, available information, external conditioning, trust, perceived compatibility, perceived usefulness, attitude and intention, and the most decisive factor in this whole process is trust.

## **RESEARCH GAP AND PROBLEM STATEMENT**

The research gap is found when it comes to study the effectiveness of online assessment in different degree programs offered by educational institutions in India. Accordingly, in the present study the research question is framed as:

Whether the online assessment is effective in different degree programs or not?

## **OBJECTIVES OF THE STUDY**

1. To check whether perception of the students of different programs towards online assessment differ with reference to demographics.
2. To assess the effectiveness of online assessment in different degree programs.

## **RESEARCH METHODOLOGY**

The present study is a descriptive type of research. The sources of data used for the study includes both primary as well as secondary sources. The self-administered and well-structured questionnaire with close ended questions has been designed, to conduct online survey. The questionnaire comprised of three sections: demographic profile, Use of technology and outlook about online evaluation. The data has been collected from 544 respondents located in

Maharashtra, India but 507 responses were complete to proceed the study. These respondents are from different Degree Programs such as B. A B. Com, B.Sc., MA, LLB, LLM, M. Com, PGDM etc. A convenience sampling has been used initially and later snowball sampling has been used.

The Five Point as well as Seven Point Likert-type scale has been used to identify outlook of the respondents. For data analysis cross tabulation, Cronbach's Alpha, Chi-square test and one-way MANOVA is used.

The present study is limited to effectiveness of online assessment in the different degree programs offered by educational institutions. The study is focused to the period of year 2020-2021 when online assessment was available as the only option to assess the learning of the students, the situation was pertaining to Covid-19 Pandemic constraints.

## DATA ANALYSIS AND INTERPRETATION

### Reliability Analysis

Reliability Analysis refers to the fact that a scale should consistently reflect the construct it is measuring. In this study Cronbach's Alpha has been used to check the relationship between each of the constructs in the scale and main dimension. As a rule, 0.70 or more represent satisfactory reliability of the items measured.

**Reliability analysis for the following variables:**

**Table No.1**

Reliability Statistics			
	Cronbach's Alpha	Cronbach's Alpha Based on Standardized Items	N of Items
Benefits of Online Assessment	.859	.865	11
Challenges in Online Assessment	.737	.759	8

The value of Cronbach's Alpha (Table No.1) are above .70 which indicates that all the constructs considered under the given dimensions are statistically reliable and valid.

### Descriptive Analysis

The data has been collected from 507 respondents who are students pursuing different Degree Programs. The data shows that 55% of the respondents were females and 45% were males. The respondents represented the three domains in which education institutions are offering Degree

and Post-Graduation programs. The majority (37.67%) of respondents were from Commerce /Management domain consisting of programs such as B. Com, BBA-LLB, BAF, BMM, BBA, MBA and PGDM. From the Arts/ Humanities domain, the representation of respondents was 30.38%, this included programs – B. A, B.Voc, B.A LLB, LLB, LLM and M.A. From the Science domain 31.95% was the representation which included students from B.Sc and M.Sc programs.

The majority (61%) of respondents were from urban area and majority (89%) have said that they have appeared for online assessment to complete their regular Degree programs. It is found that 94.5 % of the students appeared for online assessment for the first time due to pandemic constraints. There were 44% of the respondents who used mobile phone to appear for online assessments whereas 38% of the respondents have used both desktop/laptop and mobile phone. Most respondents have accepted that they have intermediate level of expertise in using internet based as well as mobile app-based services. It is good to discover that 50% of the respondents have said that they are comfortable in using e-platforms being used for online assessments and 31.6% of the respondents were not familiar with the e-platforms earlier, but they learned and now they are able to use them comfortably.

It is evident from the study that the youth is open to accept technological advancements and ready to use technology for educational purposes. When asked about the duration of online assessments, the majority (72%) of the respondents said it was less than an hour, whereas 26% have said that the duration of their online examination was ranging from 1-2 hours.

It is a general perception that if the assessment is online then students tend to secure good marks, to check the validity of this perception, respondents were asked about the marks they have secured when they appeared for online assessments. It is found that only 12.6 % respondents got above 90% marks, 25.8% got 80-90% marks, 27.6% got 70-80% marks, 20.9% got 60-70% marks, 9.5% got 50-60% marks and 3.6% respondents got below 50% marks. The majority (84%) of the respondents said that since year 2020 the examination mode is online only, that is due to pandemic restrictions.

### Inferential Statistics

There is further exploration among some selected variables to know about the association among them. Based on sample size and type of data, cross tabulation and the non-parametric test Chi-Square test and MANOVA have been used with the help SPSS 26.0, at 5% level of significance and 95% level of confidence. The following hypotheses have been tested with the help of Chi-square test (Table No.2).

$H_0$  = There is no relationship between gender and technological expertise.

Table No.2

Chi-Square Tests			
	Value	df	Asymptotic Significance (2-sided)

Pearson Chi-Square	2.635 <sup>a</sup>	4	.621
Likelihood Ratio	2.652	4	.618
Linear-by-Linear Association	1.742	1	.187
N of Valid Cases	507		
a. 1 cells (10.0%) have expected count less than 5. The minimum expected count is 4.52.			

The Sig. Value or P-Value (0.621) > 0.05(ANOVA Table No.14), hence null hypothesis cannot be rejected. It implies that there is no significant relationship between gender and technological expertise.

An attempt has been made to understand if there is statistically significant difference in the outlook of students of different degree programs about online assessment. As different subjects/specializations have different requirements when it comes to assessment. Therefore, one independent variable “Program” has been analyzed in relation with the dependent variables, namely, - No biases in test administration and scoring, reduces exam stress and anxiety, eliminates unethical practices in exam hall, helpful in securing better scores, eliminates cases of discrepancy in handling answer scripts, no feel of exam, comfort in using unfair means as exam is online, adverse effect on confidence of students about knowledge of subject, anxiety before exam about digital infrastructure, MCQ based pattern is more challenging, MCQ pattern and online exam is not uniformly effective for all subjects, enables students to be more tech friendly.

The one-way **MANOVA** has been used with the help of SPSS 26. There is one independent variable i.e., Age and aforesaid twelve dependent variables which signify the outlook of students from different degree programs about effectiveness of online assessments.

H<sub>0</sub> = There is no statistically significant difference in the outlook of students from different degree programs about effectiveness of online assessments.

Table

<b>Box's Test of Equality of Covariance Matrices<sup>a</sup></b>	
Box's M	1658.770
F	1.727
df1	780
df2	32660.822
Sig.	.000
Tests the null hypothesis that the observed covariance matrices of the dependent variables are equal across groups.	

a. Design: Intercept + Program

Table No.4

<b>Multivariate Tests<sup>a</sup></b>							
Effect		Value	F	Hypothesis df	Error df	Sig.	Partial Eta Squared
Intercept	Pillai's Trace	.948	727.566 <sub>b</sub>	12.000	482.000	.000	.948
	Wilks' Lambda	.052	727.566 <sub>b</sub>	12.000	482.000	.000	.948
	Hotelling's Trace	18.114	727.566 <sub>b</sub>	12.000	482.000	.000	.948
	Roy's Largest Root	18.114	727.566 <sub>b</sub>	12.000	482.000	.000	.948
Program	Pillai's Trace	.456	1.497	156.000	5916.000	.000	.038
	Wilks' Lambda	.624	1.506	156.000	4304.880	.000	.039
	Hotelling's Trace	.490	1.507	156.000	5762.000	.000	.039
	Roy's Largest Root	.129	4.881 <sup>c</sup>	13.000	493.000	.000	.114
a. Design: Intercept + Program							
b. Exact statistic							
c. The statistic is an upper bound on F that yields a lower bound on the significance level.							

Table No.5

<b>Levene's Test of Equality of Error Variances<sup>a</sup></b>							
			Levene Statistic	df1	df2	Sig.	
Eliminates biased test administration and scoring	Based on Mean		1.716	13	493	.054	
	Based on Median		1.010	13	493	.440	
	Based on Median and with adjusted df		1.010	13	453.525	.440	
	Based on trimmed mean		1.633	13	493	.073	
Reduces exam stress and anxiety	Based on Mean		2.016	13	493	.018	
	Based on Median		1.483	13	493	.119	
	Based on Median and with adjusted df		1.483	13	419.607	.120	



	Based on trimmed mean	1.854	13	493	.033
Eliminates exam frauds and unethical practices in exam hall	Based on Mean	2.702	13	493	.001
	Based on Median	2.162	13	493	.010
	Based on Median and with adjusted df	2.162	13	480.160	.010
	Based on trimmed mean	2.640	13	493	.001
Helps in securing better scores	Based on Mean	2.348	13	493	.005
	Based on Median	1.226	13	493	.257
	Based on Median and with adjusted df	1.226	13	385.888	.258
	Based on trimmed mean	2.000	13	493	.019
Eliminates case of discrepancy in checking and handling of answer scripts	Based on Mean	2.558	13	493	.002
	Based on Median	2.292	13	493	.006
	Based on Median and with adjusted df	2.292	13	442.004	.006
	Based on trimmed mean	2.594	13	493	.002
Students do not get feel of exam	Based on Mean	2.630	13	493	.001
	Based on Median	1.722	13	493	.053
	Based on Median and with adjusted df	1.722	13	368.751	.055
	Based on trimmed mean	2.473	13	493	.003
Comfort in use of unfair means as exams are online	Based on Mean	2.493	13	493	.003
	Based on Median	1.238	13	493	.248
	Based on Median and with adjusted df	1.238	13	403.634	.249
	Based on trimmed mean	2.333	13	493	.005
Adverse effect on confidence of student about knowledge of subject	Based on Mean	3.205	13	493	.000
	Based on Median	2.119	13	493	.012
	Based on Median and with adjusted df	2.119	13	406.008	.012
	Based on trimmed mean	3.002	13	493	.000
Anxiety about preparedness for exam based on digital infrastructure	Based on Mean	2.720	13	493	.001
	Based on Median	1.708	13	493	.056
	Based on Median and with adjusted df	1.708	13	367.886	.057
	Based on trimmed mean	2.397	13	493	.004
MCQ seems more challenging	Based on Mean	.780	13	493	.682
	Based on Median	.517	13	493	.914



	Based on Median and with adjusted df	.517	13	445.149	.914
	Based on trimmed mean	.708	13	493	.756
MCQ pattern and online exam are not similarly effective in all subjects	Based on Mean	1.242	13	493	.245
	Based on Median	.904	13	493	.549
	Based on Median and with adjusted df	.904	13	447.209	.549
	Based on trimmed mean	1.204	13	493	.273
Enables student to be tech friendly	Based on Mean	1.361	13	493	.174
	Based on Median	1.328	13	493	.192
	Based on Median and with adjusted df	1.328	13	422.928	.193
	Based on trimmed mean	1.393	13	493	.158
Tests the null hypothesis that the error variance of the dependent variable is equal across groups. a. Design: Intercept + Program					

The **Box's Test of Equality of Covariance Matrices**, (Table No.3) shows the **Sig.** Value .000 < 0.05 which signifies the covariance matrices are not equal for the groups. In the **multivariate test** (Table No. 4), it is found that Wilks' Lambda, F= 1.506, Sig. Value p (0.000) < 0.05. It implies that there is a significant difference in the outlook of the students of different programs about effectiveness of online assessment.

The **Levene's test** (as p values for majority of dependent variables > 0.05) (Table No.5), also validates the statistically significant difference in outlook of students of Arts, Science and commerce stream about online assessment's effectiveness. It considered and validated each of the dependent variables. **In case of Tests of Between- Subjects Effect it is found that the variables which have the Sig.** Value .000 < 0.05 are **No** biases in test administration and scoring, reduces exam stress and anxiety, helpful in securing better scores, eliminates cases of discrepancy in handling answer scripts, MCQ pattern and online exam is not uniformly effective for all subjects and enables students to be more tech friendly. This shows that the outlook of students of different programs varies when they opine about the given constructs.

## CONCLUSION

The analysis has shown that students have different outlook towards effectiveness of online assessment. Generally, it is assumed that online assessment avoids chances of biased test administration and the scores obtained are more genuine. For students from diverse programs, the chances of securing better scores are not uniform. It is clear from the study that the same MCQ based pattern is not justifiable for every subject. Depending on the content and application of the subject, the pattern of assessment should be customized. Though online assessment is time saving tool which may help students to validate their learnings and complete

assessment process remotely, it helps the educational institutions to conduct assessment smoothly with limited resources and declaration of result can be fast, but the same pattern of online assessment in different degree programs is not justifying the validation of knowledge base of the student as different subjects have different requirements during assessments. The online assessment is also challenging when there is lack of digital infrastructure and resources at student's end. The customization of pattern of assessment and assurance of technological support can help us to take appropriate benefits of online assessment in higher education. It can prove to be the best tool to make more people educated and employable by imparting education in areas with regional developmental imbalances or in emergency situation like pandemics.

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