

# Comparative Analysis of Student's Academic Performance in Online and Face to Face Teaching of Biochemistry at HITEC-IMS Taxila

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## ABSTRACT

**Background:** During Covid pandemic the teaching/learning shifted from face to face to online. All institutions around the world developed learning environment for the students to facilitate distant learning. Subsequently assessments also followed online. After opening of the institutions on campus learning and assessments were carried out as usual.

**Objective:** To see the effectiveness of teaching methods (online versus on campus) and to suggest improvement in both methods of teaching.

**Study Design:** Retrospective comparative study

**Place and Duration of Study:** Hitec-IMS, Taxila Pakistan from 1<sup>st</sup> September 2021 to 29<sup>th</sup> February 2022.

**Methodology:** One hundred and ninety six academic performances of students in both the methods of learning were enrolled. Using purposive sampling technique, the EOB results of online and on campus were analyzed.

**Results:** The better performance of student in term of summative assessments during online learning.

**Conclusion:** Students found online environment better for learning and performing during examinations.

**Keywords:** HITEC-IMS (Hitec Institute of Medical Sciences), NUMS (National University of Medical Sciences), EOB (end of block)

## INTRODUCTION

WHO declared Covid-19 spread a pandemic on 11<sup>th</sup> March 2020.<sup>1</sup> It has been acknowledged as a significant public health challenge because of human, economic and substantial losses.<sup>2</sup> The first case of COVID-19 in Pakistan was reported from Karachi on Feb 26, 2020, to contain and curb further spread of the disease, lockdown was instituted.<sup>3</sup>

Over years medical education has been changed from traditional apprenticeship teaching to competency based which involves regular teaching and learning activities coupled to regular assessment.<sup>4</sup>

Biochemistry and genetics being integral part of basic medical sciences explains the activities of living systems at molecular level, various metabolic and signaling pathways in health and disease.<sup>5</sup> In HITEC-IMS under NUMS curriculum biochemistry is being taught in 1<sup>st</sup> and 2<sup>nd</sup> year MBBS. To prevent effects of pandemic on health as well as on performance of medical students learning process was shifted to online from on campus.<sup>6</sup>

Commonly used apps worldwide are Zoom, Moodle, Google meet, Microsoft Teams, WebEx etc.<sup>7</sup> Keeping the scenario in mind Learning Management system was launched in HITEC-IMS to ensure continuity of academic session.

Research on impact of online teaching during pandemic is need of time to see effects of what we have done at individual, departmental and institutional level. Different researches have been done at international and national level. Cross-sectional study done at College of Medicine, Qasim University to study benefits of e-learning and online assessment came to conclusion that students perform better during online interactions (problem based learning) as well as on online exams.<sup>8</sup>

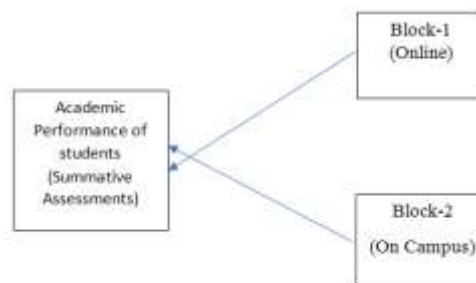
Another research done at department of Biochemistry, Christian Medical College India by means of online questionnaire concluded that online teaching had made positive impact on all aspects of learning and performance.<sup>9</sup>

National research done at different medical colleges of Pakistan have given green light to online teaching by better performances shown by students.<sup>9-11</sup>

## MATERIALS AND METHODS

Ninety eight 98 students appeared both in online and on campus end of the block examinations were enrolled. After taking permission from the Ethical Committee of the Institution, a retrospective comparative study was conducted to analyze and

compare the academic performance of students in on-line and on campus teaching. The study sample was first year session 2020-21. Using purposive sampling technique, a total of 98 students who appeared in both EOB 1 & 2 examinations were included while detainees were excluded to exclude any bias in results. The EOB examination of block 1 was online whereas block-2 was conducted on campus. The multiple-choice questions were administered in both EOB examinations and academic performance of the students in terms of marks in summative assessments was analyzed using SPSS-28. For comparing the academic performance of students in EOB1 & 2, two tailed "t" test was used, and P-value was calculated.



Conceptual framework

## RESULTS

The online mean was  $73.18 \pm 11.24$  and  $55.46 \pm 12.80$  on campus. Online results of students have higher mean value than on campus (Table 1). There is significant difference in the performance of the students in online exam compared with on campus examinations (Tables 2-3).

Table 1: The means of the both groups (n=196)

Group	Mean $\pm$ SD
Online	73.18 $\pm$ 11.24
On Campus	55.46 $\pm$ 12.80

Table 2: Levene's test for equality of variances

Variable	F	Sig.	t	df
Equal variances assumed	.759	.385	10.297	194
Equal variances not assumed			10.297	190.807

Table 3: Independent samples test t-test for equality of means

Equality of means	Sig. (2-tailed)	Mean Difference	Std. Error	Lower limit of 95% CI	Upper limit of 95% CI
Equal variances assumed	.000	1.724	1.721	14.330	21.119
Equal variances not assumed	.000	1.724	1.721	14.329	21.120

**DISCUSSION**

During Covid 19 pandemic not only the health sector is affected but also the burden on teaching as the scenario is changed and physical presence is not possible. This change in paradigm from on campus to online teaching has totally changed the modalities of learning and assessments. The finding of the study showed interesting results. The students while on online teaching performed better than on campus. The end of the block results showed significant difference in the performances. As both teaching and assessments were on same modes of teaching students felt more relaxed environment when they were at home. We have taken all the measures to prevent any cross talk and coordination between the students during exams but still there are chances they might have communicated with each other during the exam which helped them to perform better. When the students are on campus the physical presence of teachers and invigilators reduces the chances of any communication between the students. It is amazing that on campus facilities like more access to library and of course availability of faculty is more beneficial in learning, the students would have performed better than on off campus, but this was not the result.<sup>12</sup>

The findings of our study are supported by Newlands & Mclean<sup>13</sup> and Nielsen & Tutto.<sup>14</sup> They studied the performance of online and on-campus students and found that online students performed at the same level or better than as on-campus students. Similar studies have also supported our results that sometime provision of more facilities of learning in off campus teaching resulted in better performances. The administration, supporting staff and faculty were more vigilant and enthusiastic in providing favorable learning environment to the students during extraordinary situation.

In addition to that in private sector most of the students belong to good socioeconomic background the availability of electronic gadgets is of no problem for them. The ample availability of time, free at will timetable and friendly environment at home all contributed to the better performances of students.

**CONCLUSION**

The academic performance after online teaching was better than face to face teaching.

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