

## ORIGINAL ARTICLE

**Student Perception and Comparison of their Academic Performance in Online Formative Assessment Vs Summative Assessment during Covid Period**UZMA NASEER<sup>1</sup>, TAYYABA MAHMUD<sup>2\*</sup><sup>1</sup>Professor, <sup>2</sup>Assistant Professor

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Correspondence to Dr. Tayyaba Mahmud, Email: [tayyabamahmud@hotmail.com](mailto:tayyabamahmud@hotmail.com), Phone +923334794840, +924236605550-1, Ext: 492**ABSTRACT****Background:** Covid pandemic forced the teachers and students to adopt e-learning to replace traditional pedagogy.**Aim:** To see student perception on altered teaching methodology, its effectiveness by comparison of their academic performance.**Methodology:** In this cross-sectional analytical study, 141 students of 1<sup>st</sup> year MBBS (session 2019-20), participated. After taking informed consent, data was collected from score sheets of online formative assessment, 'Socrative,' and marks obtained in on-campus summative assessment in histology. Different parameters regarding student perception for e-learning and assessment were measured by using a 5-point Likert-scale questionnaire. Data were analyzed using SPSS version 26.**Results:** Paired Samples t-test was used to see the effectiveness of online teaching and was found to be insignificant (P = 0.307). Pearson Chi-square test showed a statistically significant result (P < 0.001) between the responses on learning and assessment tools, with linear association, (P value < 0.001). A correlation between learning and assessment scores (r= 0.727, P value < 0.001) was observed.**Conclusion:** Online learning can assist the teaching process in medical studies without influencing their academic performance. Practice of online teaching has prepared both students and teachers for blended learning in routine days as well as in case of a future pandemic.**MeSH Keywords:** Feedback, Academic Performance, Perception**INTRODUCTION**

The COVID-19 pandemic caused extraordinary challenges in the global education sector. In Pakistan, like in other parts of the world, the physical closure of educational institutions accelerated the use of online pedagogical methods<sup>1</sup>. Thus, teachers and facilitators were forced to adopt measures that would allow them to carry out academic activities online all over the world. For this purpose, effective use of technology-based teaching and learning tools became significant to deliver the coursework efficiently<sup>2</sup>.

According to the Universal Declaration of Higher Education in the 21st Century, modern educational methods enhance students' critical thinking and creativity<sup>3</sup>. With advancement in technology, the shift toward online learning is immense. Online learning provides resilience for the students and allows them to learn in a comfortable environment<sup>4</sup>. The transition from in-person to online learning required facilitators to introduce affordable and user-friendly technologies that would serve the purpose effectively; multiple web-based applications are now available for online learning and teaching e.g. Socrative<sup>2</sup>.

Assessment is a fundamental component of every teaching-learning process; it includes the activities teachers and students can adopt to obtain information for altering the learning process. Formative assessment includes formal and informal procedures carried out by teachers to improve the learning activities. Formative assessment aims at helping students in finding their weaknesses and strengths and target areas that need work. Early assessment feedback can help the teachers bridge the gap between the knowledge provided and the desired goals, thus making the necessary changes to the teaching strategy<sup>5</sup>.

Several modest, reliable and effective soft ware are available to aid the assessment process; broadly they are classified as Classroom response systems (CRS), e.g. Clickers, Socrative, Kahoot and Plickers<sup>6</sup>. Formative assessments provide a favourable environment for the students and encourage students to perform better<sup>7</sup>.

Socrative is a student response system that permits teachers to involve their students. It is a helpful medium for the students and also assists the lecturer to promote the spirit of learning among the students. It gives an immediate chance to see

the effectiveness of pedagogical methods; hence the teacher can make necessary amendments to improve the students' learning. Socrative facilitates learning and feedback irrespective of time and place<sup>8</sup>.

This study was conducted to see whether online teaching and assessment methods were as effective as routine methodologies as during COVID, the shift of teaching and learning shifted to complete and then partial online mode of teaching. We also aimed at getting feedback from students in our setup regarding their perception on the online teaching methods and tools utilized by us during COVID-19.

**METHODOLOGY**

This was a cross-sectional analytical study conducted in the Department of Anatomy, CMH Lahore Medical College & Institute of Dentistry, Lahore Cantt, Pakistan. The total duration of the study was six months. Ethical review committee (Case# 564/ERC/CMH/LMC) provided approval for this study. The students of 1st-year MBBS, academic session Dec 2019-Dec 2020 were part of this study; this session had 151 students. We used non-random convenience sampling method. The required sample size was 149, as calculated by the Cochran formula:

$$n = \frac{p(1-p)z^2}{e^2}$$

Students of 1st year MBBS who appeared in both summative and online formative assessments were part of the study. Students absent from either summative or online formative assessment were excluded from the study; hence the final data count became 141. Consent was taken from the students for using their records of summative assessment and scores obtained in their Socrative assessment. Names and roll numbers of students were kept anonymous to avoid bias.

Online assessment was carried out in the subject of histology using the Free version of Socrative, which allows only 50 students at a time. Thus, the class was divided into three equal groups: Group A, roll no's 1-50, Group B, roll no's 51-100, and Group C, roll no's 101-151. Students were informed ahead of time about their test batch, date, and time of examination.

To minimize cheating and exchange of information among batches, three sets of papers were prepared with ten questions each. Questions were of two types: firstly, histology-based MCQs of cognitive level C1, and secondly, questions based on

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photomicrographs of relevant histological slides (C3). After launching the quiz, the 'Open Navigation' option was utilized for the test. This option allows the facilitator to shuffle questions and answers, to further minimize the chances of cheating. Options of 'Question feedback' and 'Final score' were unselected. As the Free version of Socrative was used, we could not choose the option of 'One attempt' of the test. In addition, we wanted to allow the students to re-take the test in case of electricity shutdown or internet connectivity issues.

During the post-lockdown period, revision classes were carried out followed by traditional paper-based assessment (module exam). Examination comprised of a theory paper (MCQs and SEQs), and a practical examination (OSPE and Viva). Percentages of the marks obtained in Socrative and paper-based assessments were acquired for statistical analysis.

To gain an idea about student perception on the effectiveness of learning and assessment tools used during the Covid pandemic, a survey was planned. For this purpose, a 5-point Likert-scale questionnaire based on student perception was used in which eight parameters for e-learning and eleven parameters for assessment were measured. The questionnaire was comprised of 5-point Likert scale questions with responses ranging from 1 (strongly disagree) to 5 (strongly agree)<sup>9,10,11</sup>. At the end of the module examination, questionnaire was distributed among the students.

**Statistical analysis:** Statistical analysis was performed by using SPSS version 26. Level of significance (P value) was set at < 0.05.

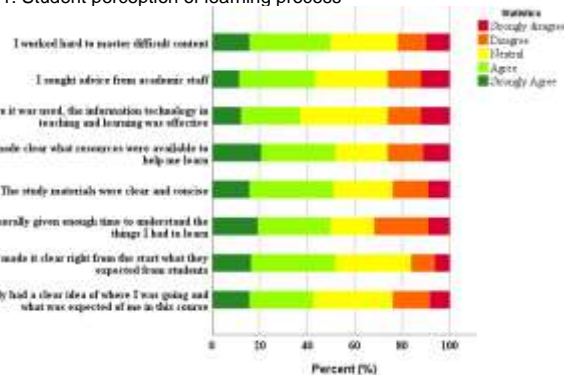
**RESULTS**

Paired t-test revealed that the scores obtained by the students in the online Socrative-based examination were slightly higher (Mean ± SD = 59.54± 22) than those obtained in the paper-based assessment (Mean±SD = 57.22±17.6) conducted during post lockdown period. However, this apparent decline in the academic performance was statistically insignificant (P value = 0.307). Out of a total of 141 respondents, overall 48% of students (n= 66) believed that their facilitators had set learning goals and standards. Fifty percent (n= 70) agreed that the academic workload was appropriate though 32% of students (n= 45) disagreed with the statement.

Nearly half of the students agreed that the learning resources provided to them in the form of study materials 72(51%) and technological aids 52(37%) were readily available and helpful.

In addition, students actively sought advice from their facilitators 61(43.2%) and also put in the effort themselves 70(50%). However, 37% of students didn't approach their teachers, while 31(22%) admitted they did not work hard on their studies (Figure 1).

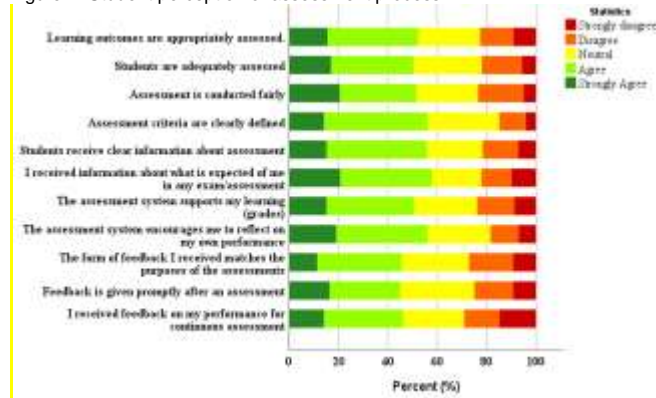
Figure 1: Student perception of learning process



Regarding student perception on assessment method, a little less than half of the respondents 64(45%) approx believed that they received prompt and effective feedback on their academic performance. Fifty-six percent (n= 79) of students were of the

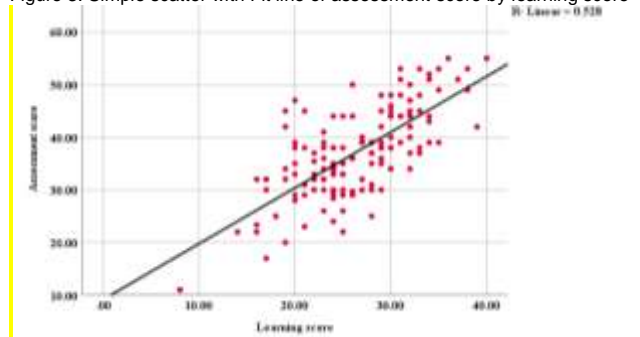
opinion that the assessment system allowed them to reflect on their academic achievement and supported their learning process 70(50%). Slightly more than half of the respondents 79(56%9) expressed satisfaction with the availability of information and instructions regarding the assessments. Furthermore, about half of the students were content with the assessment procedures (Figure 2).

Figure 2: Student perception of assessment process



Pearson Chi-square test showed a statistically significant result (P < 0.001) between the responses on learning and assessment tools, with linear association, (P value < 0.001). A positive correlation between learning and assessment scores (r= 0.727, P value < 0.001) was observed (Figure 3).

Figure 3: Simple scatter with Fit line of assessment score by learning score



**DISCUSSION**

Traditional teaching methods (including guidance, face-to-face communication, and supervision) play an important role in the development of advanced cognitive skills<sup>12</sup>. However, online lectures, textbooks and lessons have become increasingly available and mobile technology and online tools for learning are becoming more easily accessible<sup>13</sup>.

During the Covid-19 pandemic, traditional teaching completely shifted to an e-learning format without the readiness of educational institutions. In our study, there was a statistically insignificant difference in the academic performance of students, despite a significant change in the teaching and assessment methodology. Previous studies support our findings which showed that well-designed online courses used by students had the same learning impact as regular classes<sup>14</sup>. Other researchers documented the same learning outcomes for online and in-person sessions, while another study showed similar participation scores, for similar pedagogical methods<sup>15,16</sup>.

Therefore, it may be necessary to train learners and instructors to use online platforms to enhance the effectiveness of online learning by designing classes that promote learner motivation, as supported by the previous study<sup>17</sup>.

The present study highlighted prominent factors affecting students' satisfaction with online teaching and assessment. More than 50% of students showed a high level of satisfaction regarding resources and study materials available to them for effective learning; however, they worked hard to master difficult content; in this situation, the instructor needs to be more creative in designing and delivering the course material so that students can understand it without any problem and hence can improve their performance in the exams. Less than 40% of students were not convinced that information technology in teaching and learning was sufficient. Therefore, regular training sessions and workshops should be conducted for both learners and educators.

Our study also highlighted that a significant number of students were satisfied with the online assessment system as it supported their learning and encouraged them to reflect on their performance; this perception was supported by their academic performance in both online and paper-based assessment methods and was found to be insignificant.

Another advantage of online assessment is prompt feedback, which can serve as a good self-evaluation tool for the students, thus improving their learning experience and heightening their satisfaction<sup>17,18,19</sup>.

We found a positive linear trend between learning and assessment scores in our study; the coefficient of determination in this study ( $R^2=0.528$ ) showed that learning scores were probably responsible for 50% of the variation in the assessment scores, however, the remaining 50% could not be accounted for solely by learning environment and techniques, indicating that numerous factors come into play when the student prepares for and appears in the examination<sup>11</sup>. This showed that the students who were satisfied with the learning process were more likely to perform better during assessments.

Overall, the students showed high satisfaction with online learning and assessment, as supported by previous studies<sup>20,21</sup>. One study documented that designing well-structured and systematized e-courses attained student satisfaction, thus influencing knowledge buildup and student performance compared with face-to-face learning<sup>22</sup>. The current research will assist instructors in appreciating the different elements which can boost students' contentment and performance in virtual classes.

**Recommendations:** The Covid-19 pandemic showed us that changing times call for a change in learning and teaching methodologies. The general bias that only conventional teaching methods can be fruitful for the students, should be changed. Newer, technology-based learning methods should be introduced and part of routine teaching.

As Pakistan is a developing country and the general population here has a very traditional mindset, the current study and other similar works can help change the orthodox perspectives of both the teachers and parents of the students.

Government should also play an active role and allocate a sufficient budget for an uninterrupted supply of electricity and internet, as this factor proved to be a big hurdle in the smooth conduction of online classes and assessments.

At the departmental level, regular update and maintenance of photomicrograph bank of histology slides, video demonstrations, and structured and formatted multiple choice questions bank will uplift the quality of teaching.

## CONCLUSION

Our study supports that virtual learning process can facilitate the teaching practices in undergraduate medical schools, but cannot entirely replace face to face teaching and assessment process. Thus, by connecting the advantages of online learning and traditional pedagogical methods we can improve medical education. It is time to move on to another level, the newest

pedagogical concepts of the 21st century, blended learning (BL) which combines in-person teaching with online teaching.

**Conflict of interest:** Nil

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**Declaration of Interest:** The authors report no declaration of interest.

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