

STUDENTS' LEARNING COMPARISON PRE AND DURING COVID-19

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Abstract

This study compared the students' achievement on the basis of face to face and online learning. The Positivist paradigm, Quantitative approach and survey method was used for the data collection. This was a causal comparative study as the researcher couldn't manipulate the variables. Rather the researcher just explored the already available data. The Cluster sampling technique has been utilized by the researcher for the selection of the sample comprising 160 males and females students. The instrument for the data collection was the students' achievement tests that have been used to determine the students' terminal achievement level. These were their university's terminal exam papers as well as their oral presentations and written assignments. The students' scores in their oral presentations, written assignments and the final exams of one face-to-face and one online semester were taken. The collected data was analyzed while using the Descriptive Statistics including Mean, Standard Deviation and Paired sample t-test to examine the difference of students' achievement on the basis of online and face-to-face learning. Based on the findings, it is revealed and concluded that the students' achievement in face-to-face instructions/learning regarding "presentations", "final exam score" and "over all achievement" was higher than their achievement in online instructions/ learning. However, there was no statistical difference was found regarding students' achievement in "assignment". On the basis of the results, it is recommended that the Higher Education Institutes should arrange the alternate days attendance but with face-to-face learning approach so that the students' performance may not be affected.

Keywords: Face-to-face learning, online learning, students' achievement

Introduction

Learning is a vital part of human life. No one denies of Learning as one keeps on learning throughout the life. This is said to be a positive change that occurs in one's behavior. One acquires the knowledge and skills as a result of learning. The process of learning also involves the expansion of the knowledge and skills. This expansion can either because of the study or the experience (Tatlah, 2015). The previous learning is also improved by learning. This is learning which makes an individual at ease to adjust into the society and function effectively. One's life become stagnant if one stops learning because the world is changing day by day. So, it is the need of the life to keep on learning the new things in order to walk hand in hand with the rest of the world (Zulfiqar, 2016).

Face-to-face learning is an approach to learning that has been used widely across the globe. In such an approach to learning, the students formally attend their institutes for getting the education (Arias, 2018). Similarly, the teachers also comes to school and teach the students usually within the premises of the institutes. Even if the teacher teaches the students out of the institute premises, the teacher remains there with the students and interacts with them face-to-face (Christmann, 2017).

The Face-to-face approach to learning is very famous in the whole world because it is convenient for the less privilege students as well. On the other hand, the students can also interact with their peers and learn together (Zulfiqar, 2020). As the teacher remains in the

classroom, the primary effort is for clarifying the concepts to the students. The teacher can easily ask the questions to the students frequently to assess the teaching and learning progress. Similarly, the students are also at ease to ask the teacher for the difficult concepts and more examples if they remain unable to understand the concept (Paul, 2019).

No matter either a student has any gadget like personal computer, laptop or mobile phone, he/ she can be benefitted by the teaching because teacher is almost always available in classroom. Even the internet is also not a pre-requisite for attending the Face-to face class (Mgutshini, 2013). This mode approach to learning is very convenient for those students who are not in a position to afford the costly gadgets. On the other hand, the class time is fix that the students have to attend their classes during the pre-specified or pre-determined time. Even the students with low socio-economic status can work in part time to meet their educational expenses (Watkins, 2005).

Although the online learning has had been in the use before 2019 to an extent. However, Face-to-face learning was being used on a large scale throughout the world and online learning was being used by the Distance education Institutes only. These institutes usually used to offer the education from Secondary to Post-graduate level (Smart, 2001). These institutes were established to educate such individuals who either couldn't get their education in the childhood and now they were supposed to get the adult education or they were working due to low socio economic status. So, their low socio-economic status was a hurdle to the way of their education attainment. So, they were given the distance education online. The mechanism of such online classes is flexible as compared to the Face-to-face. The students are at ease to take their classes whenever they have time. They are not supposed to attend their classes on campus. Rather, they can attend their classes on line with the help of computer or tablet etc., (Altman, 2007).

The start of online instruction can be tracked in 1990s. It became possible with the spread of computer along with the facility of internet technology. The online learning is also planned like that of the face-to-face learning. However, the teachers and students are not required to present physically in the classroom/ institutions. Rather, the teacher either from the home or the institution, records the lecture and post to the institutional website and students can attend to the lecture at any time as per their convenience (Arias, 2018). Inverse to the aforementioned, the teachers delivers the lecture online through the teleconference. For this, both the teacher and students are required to be present online on any of the pre-specified platform. There, the teacher delivers the lecture and students attend him. In this scenario, both the teacher and the students are at ease to interact with each other (Christmann, 2017).

The online learning was not so common before the COVID-19 pandemic. When this pandemic came in Pakistan in 2019, the educational institutions were closed so that the students may not be affected of it. It was assumed that the people would get rid of COVID-19 with a short period of time. However, all the assumptions proved to be false when it could be eradicated even after the closure of educational institutes and the lock down at a large scale. Then the universities decided to switch their instructions and students' learning to the online learning from that of the face-to-face instructions and learning (Zulfiqar, 2020).

Anyway, the online learning has been started here in Pakistan regardless of the circumstances and now there is the need of hour to examine the effect of online learning on students' achievement. Let's have a look on the prior researches on the aforementioned phenomenon.

Zulfiqar (2020) conducted the research and investigated the students' views regarding the online as well as the Face-to-face instructions and learning. They took the university students for the collection of their data. The students given their views that they were more satisfied while learning with Face-to-face instead of the online learning.

Paul (2019) conducted a research to investigate the difference between the face-to-face learners' achievement and on-line learners' achievement. For this purpose, there were 548 students were taken by them as sample and for the data collection. However, the results showed no significant difference between the face-to-face learners' achievement and on-line learners' achievement.

Arias (2018) conducted the research to compare the online and the face-to-face learning. They sampled the undergraduate students and conducted an experiment. The results revealed that the students' achievement was not statistically different on the basis of the online and face-to-face instructions/ learning.

Christmann (2017) also endeavored to examine the difference between the online learning and the Face-to-face learning. It came to known that the students' performed higher while studying with face-to-face instructions as compared to the online classes and students preferred the Face-to-face instructions and learning.

Summers (2005) investigated the difference of students' views regarding their satisfaction of approach to learning. The students' views were taken to know that either they were satisfied with the on-line learning or face-to-face learning is more satisfactory for them? On the basis of the results, it was concluded by them that no significant difference was found among the students' views. Similarly, the difference regarding their achievement was also sought. The results were same as for the aforementioned.

In the light of the aforementioned literature, it can be said that there is a lack of researches on the phenomenon understudy especially in Pakistani context. So there was a dire need to investigate the difference of students' achievement on the basis of the online and Face-to-face learning.

Methodology

The Positivist paradigm, Quantitative approach and survey method was used for the data collection. This was a causal comparative study as the researcher couldn't manipulate the variables. Rather the researcher just explored the already available data. All the students of BS Physics at a Public University based in Lahore were the population for this study. These students included both the males and the females. There are almost eight sections and 320 students enrolled in BS Physics here. The Cluster sampling technique has been utilized by the researcher for the selection of the sample. There were 320 total students including the males and the females studying in eight sections of BS Physics. So, the Sections have been considered as the clusters each of which consisting of 40 students. The sampling detail is as under:

Table 1 *Sampling of the Students*

Steps	
Population identification	40 students × 08 sections = 320 students
Intended sample size	50% (160 students)
Cluster identification	Section
Total clusters	08
Average no. of students in each cluster	40
Randomly selected desired no. of clusters	4
Total Sample	4 Sections × 40 = 160

The instrument for the data collection was the students’ achievement tests that have been used to determine the students’ terminal achievement level. These were their university’s terminal exam papers as well as their oral presentations and written assignments. The students’ scores in their oral presentations, written assignments and the final exams were taken. These scores belonged to their one face-to-face semester and online semester.

Results

The collected data were analyzed while using the Descriptive Statistics including Mean, Standard Deviation and Paired sample *t*-test to examine the difference of students’ achievement on the basis of online and face-to-face learning.

Table 2 *Descriptive Statistics of Face-to Face Learning*

	M	SD	Skewness	Kurtosis
Presentations	8.50	.66	-.32	-.19
Assignment	8.67	1.10	-1.29	2.07
Final Term Scores	39.14	7.68	.13	-.55
Students’ Overall Achievement	56.31	7.75	.05	-.62

Table 2 shows the Descriptive statistics of Face-to-face learning that the Mean of “Presentation” is 8.50 with SD= .66. Similarly, Mean is 8.67 of the “Assignment” along with the SD= 1.10 followed by the Mean 39.14 of Final Term Scores along with the SD= 7.68 whereas the Mean of “Students’ over all Achievement” is 56.31 along with the SD= 7.75. The results of Table 4.3 further reveals that the Skewness of “Presentation” is -.32 and Kurtosis is -.19. Similarly, the Skewness of “Assignment” is -1.29 and Kurtosis is 2.07. The Skewness of “Final Term Scores” is .13 and Kurtosis is -.55. However, the Skewness of “Students’ Overall Achievement” is .05 and Kurtosis is -.62. The data is

normally distributed because all of the values of Skewness are up to ± 2 and Kurtosis are ± 7 which are up to acceptable range.

Table 3 *Descriptive Statistics of Online Learning*

	M	SD	Skewness	Kurtosis
Presentations	8.23	.47	.56	-.09
Assignment	8.40	1.88	-2.4	7.95
Final Term Scores	35.78	6.62	1.20	.53
Students' Overall Achievement	52.41	6.55	1.06	.52

Table 3 shows the Descriptive statistics of Online learning that the Mean of “Presentation” is 8.23 with SD= .47. Similarly, Mean is 8.40 of the “Assignment” along with the SD= 1.88 followed by the Mean 35.78 of Final Term Scores along with the SD= 6.62 whereas the Mean of “Students’ over all Achievement” is 52.41 along with the SD= 6.55. The results of Table 4.4 further reveals that the Skewness of “Presentation” is .56 and Kurtosis is -.09. Similarly, the Skewness of “Assignment” is -2.4 and Kurtosis is 7.95. The Skewness of “Final Term Scores” is 1.20 and Kurtosis is -.53. However, the Skewness of “Students’ Overall Achievement” is 1.06 and Kurtosis is .52. The data is normally distributed because all of the values of Skewness are up to ± 2 and Kurtosis are ± 7 which are up to acceptable range.

Table 4 *Comparison of Students’ Achievement in Presentation based on Face-to-Face and Online Learning*

	N	M	SD	df	t	p
Face-to-Face Learning		8.50	.66			
Online Learning	160	8.23	.47	159	4.13	.000

The results revealed by Table 4 depicts that there were 160 participants in this study. The mean of “Face-to-Face Learning” is 8.50 along with SD= .66 is statistically significantly higher than the mean of “Online Learning” which is 8.23 along with the SD= .47 as the $t= 4.13$ and $p=.000$ ($p<.05$). Therefore, the “Ho: There is no significant difference of students’ achievement in presentation based on online-learning and face to face learning” is rejected.

Table 5 *Comparison of Students’ Achievement in Assignment based on Face-to-Face and Online Learning*

	N	M	SD	df	t	p
Face-to-Face Learning		8.67	1.10			
Online Learning	160	8.40	1.88	159	1.52	.128

The results of Table 5 depicts regarding the comparison of students' Achievement in Assignment based on Face-to-Face and Online Learning that there were 160 participants in this study. The mean of "Face-to-Face Learning" is 8.67 along with SD= 1.10 is not statistically significantly higher than the mean of "Online Learning" which is 8.40 along with the SD= 1.88 as the $t= 1.52$ and $p=.128$ ($p>.05$). Therefore, the "Ho: There is no significant difference of students' achievement in assignment based on online-learning and face to face learning" is failed to be rejected.

Table 6 *Comparison of Students' Achievement in Final exam based on Face-to-Face and Online Learning*

	N	M	SD	df	t	p
Face-to-Face Learning	160	39.14	7.68	159	4.08	.000
Online Learning		35.78	6.62			

Table 6 reveals the results regarding the comparison of students' achievement in final exam based on face-to-face and online Learning that there were 160 participants in this study. The mean of "Face-to-Face Learning" is 39.14 along with SD= 7.68 is statistically significantly higher than the mean of "Online Learning" which is 35.78 along with the SD= 6.62 as the $t= 4.08$ and $p=.000$ ($p<.05$). Therefore, the "Ho: There is no significant difference of students' achievement in final exam based on online-learning and face to face learning" is rejected.

Table 7 *Comparison of Students' over all Achievement based on Face-to-Face and Online Learning*

	N	M	SD	df	t	p
Face-to-Face Learning	80	56.31	7.75	159	4.96	.000
Online Learning	80	52.41	6.55			

Table 7 reveals the results regarding the comparison of students' over all achievement based on face-to-face and online Learning that there were 160 participants in this study. The mean of "Face-to-Face Learning" is 56.31 along with SD= 7.75 is statistically significantly higher than the mean of "Online Learning" which is 52.41 along with the SD= 6.55 as the $t= 4.96$ and $p=.000$ ($p<.05$). Therefore, the "Ho: There is no significant difference of students' over all achievement based on online-learning and face to face learning" is rejected.

Conclusion

Based on the findings, it is revealed and concluded that the students' achievement in face-to-face instructions/learning regarding "presentations", "final exam score" and

“over all achievement” was higher than their achievement in online instructions/ learning. However, there was no statistical difference was found regarding students’ achievement in “assignment”.

Discussion

The findings of this study supported the findings from the study conducted by Zulfiqar (2020) who investigated the students’ views regarding the online as well as the Face-to-face instructions and learning. They took the university students for the collection of their data. The students given their views that they were more satisfied while learning with Face-to-face instead of the online learning. The findings of this study showed the students’ higher performance with face-to-face approach to learning as compared to their performance in online learning approach. This shows that the students were more satisfied and learnt better while studying with the face-to-face learning approach than the later one.

However, the findings of this study showed a significant difference between the students’ achievement on the basis of the learning approach (face-to-face and online) which were contradictory to the findings of a study conducted by Paul (2019) who investigated the difference between the face-to-face learners’ achievement and on-line learners’ achievement. For this purpose, there were 548 students were taken by them as sample and for the data collection. However, the results showed no significant difference between the face-to-face learners’ achievement and on-line learners’ achievement.

The findings of this study showed a significant difference between the students’ achievement on the basis of the learning approach (face-to-face and online) which were also contradictory to the findings by Arias (2018) who conducted the research to compare the online and the face-to-face learning. They sampled the undergraduate students and conducted an experiment. The results revealed that the students’ achievement was not statistically different on the basis of the online and face-to-face instructions/ learning.

However, the findings of this study showed a significant difference between the students’ achievement on the basis of the learning approach (face-to-face and online) which supported Christmann (2017) who endeavored to examine the difference between the online learning and the Face-to-face learning. It came to known that the students’ performed higher while studying with face-to-face instructions as compared to the online classes and students preferred the Face-to-face instructions and learning.

The findings by Summers (2005) are also supported by the findings of the current study. They investigated the difference of students’ views regarding their satisfaction of approach to learning. The students’ views were taken to know that either they were satisfied with the on-line learning or face-to-face learning is more satisfactory for them? On the basis of the results, it was concluded by them that no significant difference was found among the students’ views. Similarly, the difference regarding their achievement was also sought. The results were same as for the aforementioned.

Recommendations

On the basis of the results, the recommendations have been stated below:

- A Mixed Method study may be conducted to get a deeper insight into the phenomenon.

- The Higher Education Institutes should arrange the alternate days attendance but with face-to-face learning approach so that the students' performance may not be affected.
- The teachers should take the students' presentations face-to-face instead of the online approach so their performance may not be affected due to any internet availability issue and etc.

The Higher Education Institutes should conduct the students' exams with face-to-face approach so their performance in the academics any not be affected.

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