



## Impact on Student's Achievement in Learning Science after COVID-19 at Grade 8<sup>th</sup>

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### ABSTRACT

The objective of the study was to find out the impact of students' achievement in learning science after covid-19. The current study was the survey in nature and quantitative approach was used for the present study. In order to collect data from school students and to check their interest in science and online learning during and after COVID-19 we used one questionnaire and one achievement test. The population of this study were male and female 8th grade school students from one public and two private institutes of Lahore District. A sample of this research was 100 male and females students of the Public School; Laboratory High School IER PU, Private School; The Pilot School and Private Academy; Adan Science Academy, Lahore by using convenient sampling technique. The instrument of the study was questionnaire. Descriptive and inferential statistics was used. The findings of the study was revealed that there was a highly significant impact of students' achievement in learning science after covid-19.

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## 1. Introduction

In this age of technological progress and globalisation, education is seen as the foundation of all human endeavours. It is associated with an individual's well-being and prospects for a better life, and it is essential to the development of human capital. It guarantees that people gain the information and abilities needed to boost their output and enhance their quality of life. This rise in productivity also creates new revenue streams, which further boost a nation's economic expansion. For educators, the calibre of student performance continues to be paramount. Its purpose is to effect change on a local, regional, national, and international level. Researchers, educators, and trainers have long been interested in examining the factors that positively impact learners' performance quality. These factors impact pupils' academic progress both inside and outside of the classroom. These elements might be referred to as peer, family, school, and student factors (Di Pietro, 2023). Formal research on the significance of these demographic determinants dates back to the seventeenth century. These variables often include age, gender, marital status, ethnicity, geographic belongingness, socioeconomic position (SES), parental occupation, educational attainment, language, income, and religious affiliations. Usually, these are covered under the demographics heading. Demography is used more broadly to describe a method of investigating the characteristics and implications of demographic data in the biological and social setting. Regretfully, determining and assessing the quality of education is a difficult task, and the complexity of this process rises as a result of the shifting values of quality traits linked to the perspectives of various stakeholders (Stevanović, Božić, & Štrboja, 2023). In addition to other variables, educational experts have studied and discussed socioeconomic status as one of the most important elements influencing students' academic achievement. The most common defense is that students' socioeconomic situation has an impact on the

calibre of their academic work. The majority of specialists contend that pupils of poor socioeconomic level do worse academically because their basic requirements are not met, which hinders them from improving their performance (Lee & Ha, 2023). Students with low socioeconomic status have poor environmental quality, which lowers their self-esteem (US Department of Education, 2003). More precisely, the goal of this research is to pinpoint and examine the variables that influence how well kids perform academically. The effects of COVID-19 are widespread and evident in practically every industry, but they are most noticeable in the fields of education, health, and the economy. Numerous daily updates detailing the virus's impact on millions of people worldwide have been released since it was declared a pandemic in March 2020. As a result, stopping the virus's spread and lessening its consequences on society as a whole—and on the most vulnerable groups in particular—have become the top priorities for all nations. Medical research suggests that infectious disease experts and public health officials worldwide appear to agree on restricting in-person instruction to prevent the pandemic from spreading among students and the community as a whole (Kurnianto, Rahmat, & Kuswanto, 2023).

The "level of student success in learning the subject matter in schools that are expressed in the form of scores obtained from the results of tests on a particular subject matter" is what Shah (2008) defines as learning achievement. Concurrently, "learning achievement is the acquisition of knowledge or skills that are developed by subject matter, usually indicated by test scores or numerical value is assigned by teachers" From this, it can be deduced that learning achievement is the percentage of pupils in schools that succeed, represented as a numerical figure. A number of elements can influence learning outcomes; generally speaking, these aspects are grouped to potentially impact the study's success. According to Wenning et al. (2003), each state is free to design its own science curriculum, conduct its own assessments, and establish its own performance requirements for scientific competency. The definition of learning can be seen as generally stable behavioural changes brought about by experience and training (Fortus, Lin, & Passentin, 2023). If a student changes, then learning was effective. However, not all behavioural changes brought on by learning can be considered successful because those changes typically exhibit embodiment traits (Alon, Sung, Cho, & Kizilcec, 2023). According to Ali Muhammad (2004), learning is a change in behaviour brought about by interactions with the environment. Whether or not learning involves purposeful interaction with the environment, learning is considered successful if the learner experiences a change. On the other hand, learning is unsuccessful if the individual does not change. The outcome of an action completed, whether alone or in a group, is an achievement (Anthonysamy & Singh, 2023). The completion of the learning process, learning outcomes are the product of an interaction between learning acts and teacher-led instruction. Teaching actions conclude with the assessment of students' learning outcomes (Sun et al., 2021; Suraj, Kohle, Prakash, Tendolkar, & Gawande, 2023).

According to the explanation given above, learning activities are what lead to students' attainment of learning by using all of their potential. By setting up test assessments of learning outcomes, one can determine whether learning outcomes have been met. The purpose of assessment is to determine the degree to which the student has successfully applied the teacher's lessons. Teachers also have the authority to decide how much of their own teaching and learning is done in the classroom. In addition to student accomplishment, natural scientific learning achievement can be defined as the result of actively and directly incorporating every student's potential in cognitive (knowledge), affective (attitude), or psychomotor (skills) aspects of science instruction (Kurt & Tas, 2023). One way to think of the outdoor cooperative learning paradigm is as an approach to learning outside of the classroom. The majority of learning activities take place outside of the classroom. Since natural science is concerned with discovering a systematic nature, it is a process of discovery as well as a means of mastering knowledge in the form of ideas, facts, or principles (Acheampong, 2023; Mohsin, Kamran, Nawaz, Hussain, & Dahri, 2021). It is anticipated that science education will serve as a means for students to gain knowledge about the environment and themselves, as well as opportunities for future advancement in its application to everyday life. The emphasis of the learning method is on giving students hands-on experience in order to build competency in order to investigate and comprehend scientific nature. The goal of science education is to pique students' curiosity so they can have a deeper comprehension of the natural world. Enhancing children's learning abilities can be achieved in part through outdoor learning.

Instead of learning in a classroom with numerous constraints, children might learn more deeply by working with the objects that they encounter. Learning outside of the classroom can also assist kids in applying what they have learned (Awaah et al., 2023). Rather than being an addition to schools, outdoor learning is an alternative educational philosophy that should be seen as fundamentally distinct from regular teaching. The removal of structural restrictions placed on outdoor education centres by the national curriculum and government-funded curriculum enhancement initiatives, together with a decrease in or elimination of the requirement that these facilities continuously assess the results of their operations. Due to their unrestricted thoughts outside of the classroom walls, pupils who learn outside experience a greater sense of freedom (KISACIK, Sonmez, & Ozdas, 2023). According to Husamah (2013), outdoor learning is a technique for teaching science that involves going on adventures around the neighborhood while closely observing the surroundings and documenting the findings on observation worksheets (Nnoli & Samuel, 2023).

Students was happier and feel more satisfied when outdoor learning is implemented since they will have firsthand experience. Therefore, they will become more motivated. Student achievement in science will increase with motivation and the utilisation of the outdoor cooperative learning paradigm. The threats we confront increase in tandem with the world's increasing interconnectedness. National boundaries have not halted the COVID-19 pandemic (Lamery, Valera, & Limos-Galay, 2023). People of all genders, nationalities, educational attainment levels, and income levels have been impacted. However, this has not been the case for its effects, which have disproportionately affected the most vulnerable have estimated the long-term economic impact of this loss at roughly one-third of a year's worth of education for the present (Taj, Tahir, Ishfaq, & Iqbal, 2023). When they go to the next level of study, a lot of students in the COVID-19 cohort are concerned that they may experience long-term disadvantages in comparison to their face-to-face study counterparts. It's not always reassuring to hear from postsecondary institutions that they will follow the relevant admission requirements (Relyea, Rich, Kim, & Gilbert, 2023). There has also been a dearth of empirical data regarding the pandemic's actual effects on student learning worldwide. Only a few, non-peer reviewed research surfaced in November and December 2020. After visiting and speaking with teachers at 380 schools, Ofsted, (2020) stated that basic skills and knowledge were lost for kids of all ages in the UK.

### **1.1. Significance of Study**

The Covid-19 pandemic has disrupted education worldwide, negatively affecting students' lives and, regrettably, likely having a long-term effect on their future academic performance. Over 90% of schoolchildren worldwide were affected by the COVID-19 pandemic, which caused unprecedented disruptions to over 190 education systems worldwide (Psacharopoulos, Collis, Patrinos, & Vegas, 2021). Relatively little is known about how much more of a problem it has caused in emerging nations. This is because these nations already lacked government policies for localised education technology development, e-learning solution providers, internet accessibility, and student personal resources. Pakistan set an example for the rest of the globe by handling the Covid-19 situation better than many other nations and avoiding the necessity for a complete lockdown. Its clever strategies even managed to keep the economy afloat. Pakistan, with a recovery rate of about 98 percent, is unexpectedly safe when compared to Europe and the U.S., despite being close to China, the country where the first Covid-19 infection was discovered, and India, the country that is second most impacted.

### **1.2. Statement of the Problem**

This study focuses on how scientific education affects students' academic performance in the wake of the COVID-19 pandemic. Eighth-grade science students experienced negative effects from distance or online learning. "Impact of students' achievements in learning Science after Covid-19 at grade 8th" is the theme of our study.

### **1.3. Research Objectives**

This study was conducted to achieve following objectives:

- Identify interest of students in science at grade 8<sup>th</sup>.
- To explore the impact of Covid -19 on student's achievements.
- Explain how online learning affected their achievement in science during this period.
- Identify problems they faced during online learning of science.

- Identify the difference between the higher achievers and lower achievers in physical classes.
- Find the effect of demographic variables on students learning in science.

#### 1.4. Research Questions

The research was conducted according to following research questions:

- How students interest in science effect their learning in science?
- How student's achievement is affected by online learning?
- What are the problems faced by students during online learning?
- How online learning affected student's learning in physical classes after the pandemic?

## 2. Methodology

The current study was the survey in nature and quantitative approach was used for the present study. In order to collect data from school students and to check their interest in science and online learning during and after COVID-19 we used one questionnaire and one achievement test. The population of this study were male and female 8<sup>th</sup> grade school students from one public and two private institutes of Lahore District. A sample of this research was 100 male and females students of the Public School; Laboratory High School IER PU, Private School; The Pilot School and Private Academy; Adan Science Academy, Lahore by using convenient sampling technique.

**Table 1**

Sr. no	Names of institutes	Male	Female	Total
1.	The Laboratory High School	23	0	23
2.	The Pilot School	33	0	33
3.	Adan Science Academy	17	27	44

One questionnaire and one achievement test were used as a research instrument to collect information about the interest of students in science and effect of online learning on their achievements of grade 8<sup>th</sup> students of three different institutes through survey. Students' achievement was assessed by using the achievement test which was made from their general science textbook. It consisted of 30 mcq's. The questionnaire was used to assess their interest in science subject and experience of online education.

**Table 2: Scoring procedure for interest in science**

Scale	Positive statements	Negative statements
Strongly Disagree	1	5
Disagree	2	4
Neutral	3	3
Agree	4	2
Strongly Agree	5	1

## 3. Data Analysis

Data analysis was done by using statistical package for social science software (SPSS) version 15.0, by which frequency and percentage of every statement of the questionnaires/tests were calculated. Researchers applied t-test, ANOVA and Pearson r for comparison, effect and relationship respective.

### 3.1. Data Analysis and Interpretation

- 70.3% students like science while 21.8% do not like Science.
- 69.3% students enjoy learning science while 19.8% do not enjoy learning Science.
- 61.4% students look forward to a Science lesson while 22.8% do not.
- 60.4% students said that science is a boring subject for them while 21.8% disagree.
- 59.4% students claim that they find Science applicable in other subjects while 22.8% said they do not find Science applicable in other subjects.
- 56.5% said they need Science for their career while 27.7% differ.
- 62.4% believes that it is important to do well in science while 24.8% deviate.
- 57.5% belives that science is a difficult subject while 30.7 % find it eassy.
- 57.5% students thought that they would avoid Science if it were optional while 31.7% disagree.

- 61.4% students were excited to for going their class room back while 26.7% were not excited.
- 60.4% were eager to attend physical classes while 22.8% were differ.
- 57.5% said they like online learning while 22.8% said they like physical classes
- 49.6% students have internet access during online classes while 36.6% do not have internet access.
- 60.4% students believes that they can get good marks in online sessions while 27.7% do not think so.
- 54.4 % students find online learning difficult while 29.7% find it eassy.
- 54% students admit that online learning effect their performance while 31% do not admit this.
- 60% are satisfied from their learning while 23.9% are not satisfied.
- 66.4% of students have support of their teacher during online learning while 20.8% do not have their teacher support
- 61.4% students are satisfied from online evaluation system while 27.7 % are not.
- 61.4% find it difficult to manage physical classes while 21.8% deviate.
- 60.4% students agree that pandemic period effect their learning while 23.8% disagree.
- 66.4% students said they are following SOP's during physical classes while 18.8% do not do this
- 69.3% students said that the COVID effects the traditional learning while 19.8% disagree
- 54.4% find it difficult to meet assignment deadline in physical classes while 24.8% dissent.
- 65.3% said that in future it will be easy for them to maintain online classes while 24.7% discord this.

**Table 3: Frequencies**

Statements	SA	A	N	D	SD
Do you think you like science?	43	28	7	8	14
	42.6%	27.7%	6.9%	7.9%	13.9%
Do you enjoy learning science?	27	43	10	10	10
	26.7%	42.6%	9.9%	9.9%	9.9%
Do you look forward to a Science lessons?	22	40	15	11	12
	21.8%	39.6%	14.9%	10.9%	11.9%
Is science a boring subject to you?	29	32	17	8	14
	28.7%	31.7%	16.8%	7.9%	13.9%
Do you find Science applicable in other subjects?	30	30	17	13	10
	29.7%	29.7%	16.8%	12.9%	9.9%
Do you think you need Science for your career?	33	24	15	17	11
	32.7%	23.8%	14.9%	16.8%	10.9%
Do you think it is important to do well in Science?	35	28	12	12	13
	34.7%	27.7%	11.9%	11.9%	12.9%
Do you believe that Science is a very difficult subject?	34	24	11	16	15
	33.7%	23.8%	10.9%	15.8%	14.9%
Do you feel like you would avoid Science if it were optional?	35	23	10	14	18
	34.7%	22.8%	9.9%	13.9%	17.8%
Were you excited about going to your class room back?	31	31	11	18	9
	30.7%	30.7%	10.9%	17.8%	8.9%
Were you eager to attend physical class?	25	36	16	8	15
	24.8%	35.6%	15.8%	7.9%	14.9%
Do you like online learning?	25	33	19	15	8
	24.8%	32.7%	18.8%	14.9%	7.9%
Do you have internet access during online classes?	25	25	13	19	18
	24.8%	24.8%	12.9%	18.8%	17.8%
Do you think you can get good marks in online classes?	33	28	11	17	11
	32.7%	27.7%	10.9%	16.8%	10.9%
Do you find online learning difficult?	29	26	15	17	13
	28.7%	25.7%	14.9%	16.8%	12.9%
Do you think online learning effects your performance?	17	37	15	14	17
	17.0%	37.0%	15.0%	14.0%	17.0%
Are you satisfied about your learning?	20	40	17	12	11
	20.0%	40.0%	17.0%	12.0%	11.9%
Do you have support of your teacher during online learning?	33	34	12	13	8
	32.7%	33.7%	11.9%	12.9%	7.9%
Are you satisfy from the online evaluation system?	28	34	10	17	11
	27.7%	33.7%	9.9%	16.8%	10.9%
Do you now find it difficult to manage physical classes?	31	31	16	12	10
	30.7%	30.7%	15.8%	11.9%	9.9%
Does this pandemic period effect your learning?	26	35	15	19	5
	25.7%	34.7%	14.9%	18.8%	5.0%

Are you following SOPS in your physical classes?	35	32	14	11	8
	34.7%	31.7%	13.9%	10.9%	7.9%
Do the covid effect the traditional learning?	33	37	10	13	7
	32.7%	36.6%	9.9%	12.9%	6.9%
Do you find it difficult to meet your assignment deadline in this physical classroom environment?	27	28	20	12	13
	26.7%	27.7%	19.8%	11.9%	12.9%
In future will it be easy for you to maintain the online classes?	28	38	9	16	9
	27.7%	37.6%	8.9%	15.8%	8.9%

**Table 3: Independent sample t-test**

Variable	N	Mean	df	t	Sig.
Male	65	41.0462	98	2.732	.684
Female	35	35.4857			

Table 3 indicates that, at the  $p \leq 0.05$  level of significance, the t value (2.732) is not significant. Therefore, it is believed that there is no significant mean difference between the interest in science among male and female students in grade 8. It is determined that eighth-grade boys and girls share a comparable interest in science.

**Table 4: Online Learning: Independent sample t-test**

Variables	N	Mean	df	t	Sig.
Male	65	50.8154	98	1.825	.147
Female	35	46.5714			

Table 4 indicates that, at the  $p \leq 0.05$  level of significance, the t value (1.825) is not significant. Thus, our null hypothesis—that there is a meaningful mean difference in online learning between male and female students—is accepted. The conclusion is that, when it comes to online learning, there is no discernible mean difference between male and female students.

**Table 5: Independent sample t-test**

Variables	N	Mean	df	t	Sig.
Male	65	91.8615	98	2.373	.092
Female	35	82.0571			

Table 5 indicates that, at the  $p \leq 0.05$  level of significance, the t value (2.373) is not significant. With the acceptance of our null hypothesis, which states that there is no significant mean difference between male and female students' learning after COVID-19, it can be said that there is no significant mean difference between learners' learning after COVID-19.

**Table 6: Univariate analysis for effect of fathers' qualification on students' interest in Science at grade 8<sup>th</sup>.**

Source of variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	27.021	33	.819	1.104	.358
Within Groups	48.939	66	.742		
Total	75.960	99			

Table 6 shows that at the  $p < 0.05$  threshold of significance, the F value (1.104) is not significant. Consequently, the null hypothesis we proposed, which states that there is no meaningful relationship between father qualification and pupils' interest in science in grade 8, is accepted. This leads us to the conclusion that there is no significant relationship between father qualification and science interest in grade 8.

**Table 7: Univariate analysis for effect of father qualification on online learning of students' at grade 8<sup>th</sup>**

Source of variance	Sum of Squares	df	Mean Square	F	Sig.
Between Groups	29.310	34	.862	1.201	.259
Within Groups	46.650	65	.718		
Total	75.960	99			

Table 7 shows that at the  $p < 0.05$  threshold of significance, the F value (1.201) is not significant. Therefore, it is determined that student father qualification is independent of

scientific online learning and that our null hypothesis, which states that there is no significant influence of father qualification on students' online learning in grade 8, is accepted.

#### 4. Conclusion

Our research led us to the conclusion that the great majority of eighth graders have a passion for science. Over 50% of kids find science to be enjoyable and of interest. While some students look forward to science, a considerable percentage do not. The majority of pupils think science is a dull subject. The majority of students also believe that they can use their scientific knowledge in other courses. The majority of students believed that science was necessary for their careers. While some students disagree, others share the belief that performing well in science is crucial. A minority of pupils thought science was not a tough subject, whereas some students thought it was. The majority of pupils couldn't wait for their actual classes to start again. While some students were adamant about attending in-person classes, the majority of students were not. While some students prefer in-person instruction, the majority prefer online learning. During this session, a group of pupils has access to the internet. While some students might not think that way, the majority of students think that they can succeed in online classrooms (Gore, Fray, Miller, Harris, & Taggart, 2021).

While some students find online learning easy, a significant portion of students find it challenging. While some students disagreed, the majority of them believed that learning online had an impact on their grades. Some students believed that managing their education during a pandemic was challenging. The majority of pupils are happy with what they have learned. While some students might not receive support from their lecturers during online sessions, the majority do. Few pupils do not adhere to SOPs during class; the majority comply. It was startling to see that while some kids disputed, the majority of students claimed that COVID had an impact on their regular education. While some students find it easy, many find it challenging to turn in assignments by the deadline in traditional classroom settings. While some students disagree, the majority of students believed that maintaining online classes would be simple in the future. Our data indicates that in eighth grade, the interests of boys and females in science were similar. These have an impact on their future academic success. In addition, we may state that science-related issues affect students of both genders equally. However, following COVID-19, we discovered that gender had no bearing on learning.

The father's education has no discernible impact on the student's interest in science. The qualifications of the student's father have no bearing on their online education. After COVID-19, there is no impact on pupils' learning. Additionally, we discover that eighth-grade students' enthusiasm in science was unaffected by their mother's qualification. We discover that the qualification of their mother has little bearing on online learning. After COVID-19, their learning was unaffected by their mother's qualification. The occupation of dads has no discernible effect on students' interest in science. The father's job has no bearing on the online education of the students. Learning after Covid-19 is not influenced by their dads' line of work. The degree to which eighth-grade pupils succeed in their science studies has a big impact. Students' passion in their accomplishments in science study has a significant impact. Online learning has an impact on science students' academic performance. Science achievement among students is impacted following COVID-19 in grade 8.

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