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COVID-19 PANDEMIC AND PARADIGM SHIFT IN HIGHER EDUCATION: ANALYSIS OF ONLINE DIMENSION

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ABSTRACT

COVID-19 pandemic was one of the few incidents in the human history that have profound impact on the all sectors of human life. This pandemic has transformed education sector through re-orienting and re-shaping it. The post-pandemic paradigm shift has been swiftly altering all segments of life. The process of transition is rapid and impulsive in the field of higher education. This study had been designed to analyze the paradigm shift in higher education due to COVID-19 with a focus on the online dimension. This study was guided by two main objectives; to analyze the paradigm shift in higher education in pre and post COVID era and to find out challenges faced by people in the wake of new paradigm shift. This study employed Google Trends data on Comparison of five major teaching platforms; Coursera, EdX, Google Classroom, Google Meet and Zoom. Google Trends provides search analysis. It gives multifaceted comparisons of search volume over time. Research studies found Google Trends data both valid and reliable. We collected past twelve months Google Trends data on the selected five major teaching platforms. Data was analyzed through t-test. On the basis of findings of the study it can be safely concluded that COVID-19 pandemic has proved as a source of Paradigm Shift in the world. It has shifted higher education from on-campus to online mode. It has promoted the paradigm shift from *real to virtual world* including education; particularly it has resulted in more technology reliance in higher education.

Keywords: *Paradigm Shift, Higher Education, Online, Dimension*

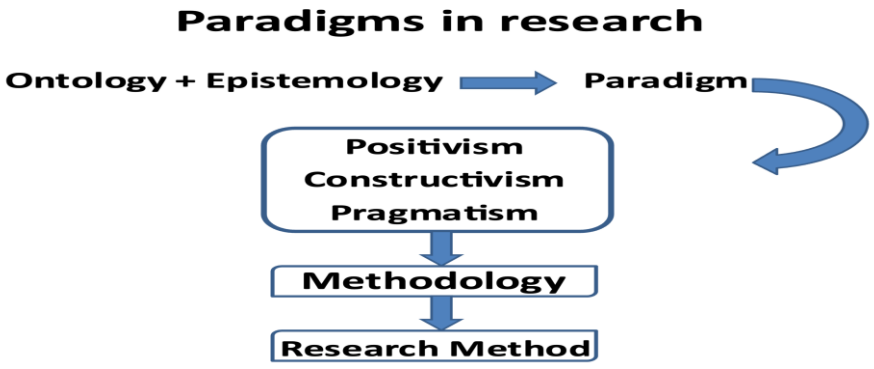
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1. INTRODUCTION

The China is the first country in the world that faced Covid-19 disease and with the passage of time the covid-19 spread all over the globe. As all the countries were facing problem in terms of sectors. Same as educational institution had introduced virtual classes in all over the world. China had started online teaching before the covid-19, but this educational teaching creates problems or issues from the first day and all stakeholders were not prepared to maintain technical issues or problems immediately and same condition in all around the world during pandemic. Warsi (2021) writes in her paper that, factors affecting online learning during Covid-19 pandemic positively and negatively. But Pakistani universities such as AIOU (Allama Iqbal Open University) need more improvements in LMS (learning management system). A change in the way of thinking about or doing something**.** Replacing the old mindset or method with a new one. It can be Research, Technology, Education, Governance, Daily Life ad etc. Nanotechnology led Paradigm shift, two examples SMART & AI.

1.1. Application of Paradigm in Research

A paradigm determines how researchers view phenomenon and the research methods that should be employed to study it.



A journey from simple to smart paradigm shift people used before lighten then they shifted to bulb then bulb to LED bulb and then remote light bulb or fans etc. Similarly, a paradigm shift in communication technology people used before the skin of animal as a paper and leaf for the purpose of writing's then paper and pen developed, then telephone then mobile and then smart mobile all applications such WhatsApp, Facebook Instagram and etc. Now, people can communicate within a second with each other's.

ToexploreparadigmshiftinhighereducationinthewakeofCOVID-19. The study aims to analyze the paradigm shift in higher education impend post COVID era. Moreover, the study tries to find out challenges faced by people in the wake of new paradigm shift.

2. LITERATURE REVIEW

Maqsood et al. (2021) write in their paper that during the COVID-19, the mode of delivery lectures on all levels primary, Secondary and higher educational institutions becomes digital and this is paradigm shift in the educational system. Although, COVID-19 is a big challenge specially to expand national education systems. Covid-19 has the cause of positive and negative paradigm shift in all the fields and in the education system. It is concluded that a positive shift but cannot deny the lack of resources throughout the world but especially in Pakistan. Moreover, mostly people in Pakistan during covid-19 did not utilize their time in productive, efficient work or teaching and learning activities. Additionally, people in Pakistan were more engaged in entertainment activities. The online teaching and learning are not a new dimension, many universities was conducting online mode of teaching and learning from different perspectives in previous era as according to (Prem et al., 2020), virtual model of teaching and learning many institutions have started and this is not new phenomena. Dhahri et al. (2020a) states that several countries including Pakistan faced lots of technical and monitoring challenges in the phase of COVID-19 in online education. Therefore, collaboration with the technologically advanced educational and technical organization can perform better to encourage online learning (Dong et al., 2020).

3. DATA AND METHODOLGY

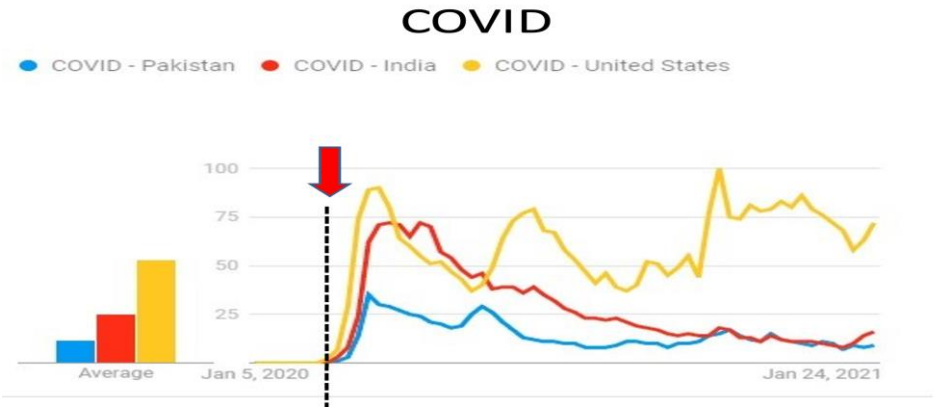
There are many online search data sources, i.e. Alexa, Kaggl, Altmetric, Googletrends etc. This study employed Google Trends data. Google Trends provides search analysis. It gives multifaceted comparisons of search volume over time. Research took as an assumptions Google Trends search data is a predictor of application. Data on teaching and learning platforms search include Higher education as well.

The paradigm shift in Education, before covid-19 educational institutions were not used to online learning system, educational institutions used physical classes where limited students can attend classes. But during the covid-19 educational institutions developed LMS (Learning Management System), where not only limited students can attend classes, but number of students can attend classes at the same time and no matter where they live. This Covid-19 paradigm shift also impacted negative effect as this online learning system has created social distances and before that, students learn through activity-based learning, teamwork, or cooperation as well. But this online system also created a distance learning environment which may be not good in future. Because this distance learning system, disconnects from the combine learning environment which is not good for the individual in future as well. Additionally, Online learning system also connect different people from different regions in single platform without changing their locations. Moreover, this online paradigm shift also enhance the effective use of technology in the education institutions. Therefore, this paradigm shift is a positive impact also in this world.

4. RESULTS AND DISCUSSION

This graph shows that the term covid, how many times has searched in different countries. The graph clearly shows that before 5 Jan 2020 nobody had searched the word covid in Pakistan, India, and United States, but after the searching was increased in United States 80%, in India 74% and in Pakistan 30 % had searched the term covid.

Figure 1: The Term COVID



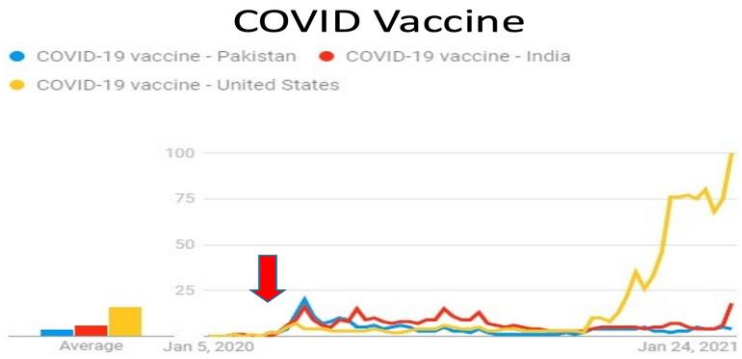
Source: Google Trend, 2021.

The graph 2 shows that the term covid vaccine, how many times has searched in different countries. The graph clearly shows that before 5 Jan 2020 nobody had searched the term covid vaccine in Pakistan, India, and United States, but after that the searching was increased in United States 100%, in India 23% and in Pakistan 5% had searched the term covid vaccine.

The figure 3 shows that the term online, how many times has searched in different countries. The graph clearly shows that before 5 Jan 2020 people had searched the term online in Pakistan, India, and United States, rarely but after that the searching was increased in United States 100%, in India above 50% and in Pakistan above 25% had searched the term online. This is again a positive paradigm shift of the perception of the people. But this graph also indicates that the flow of searching was decreasing till the Nov 29, 2020.

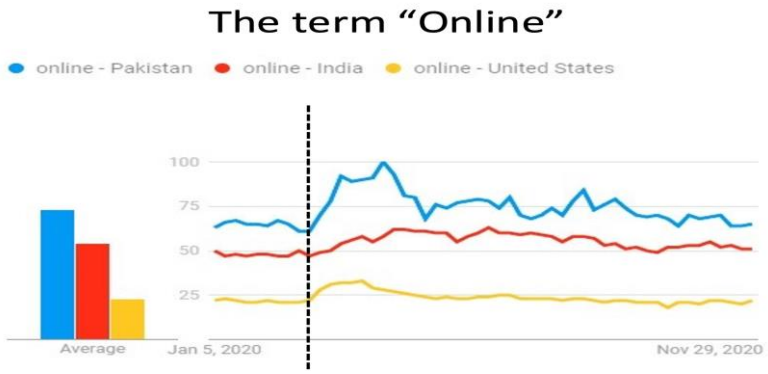
The figure 4 shows that the term online learning, how many times has searched in different countries. The graph clearly shows that before 5 Jan 2020 people had searched the term online learning in Pakistan, India, and United States, 25% but after that the searching was increased in United States 73%, in India above 73% and in Pakistan 100% had searched the term online learning. This is again a positive paradigm shift of the perception of the people. But this graph also indicates that the flow of searching was decreasing and till the Nov 29, 2020, it has been reached above 25% in these three mentioned countries.

Figure 2: The Term Covid Vaccine



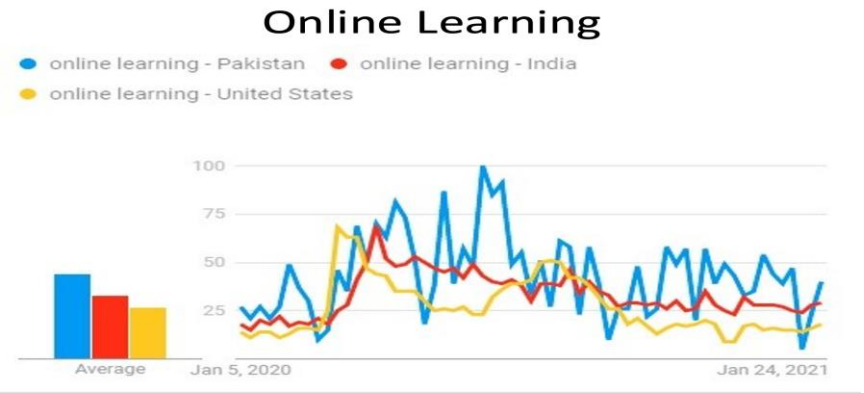
Source: Google Trend, 2021.

Figure 3: The Term Online



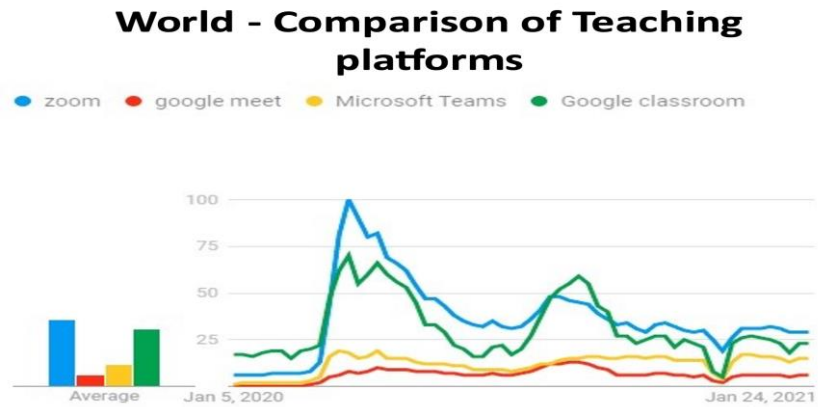
Source: Google Trend, 2021.

Figure 4: The Term Online Learning



Source: Google Trend, 2021.

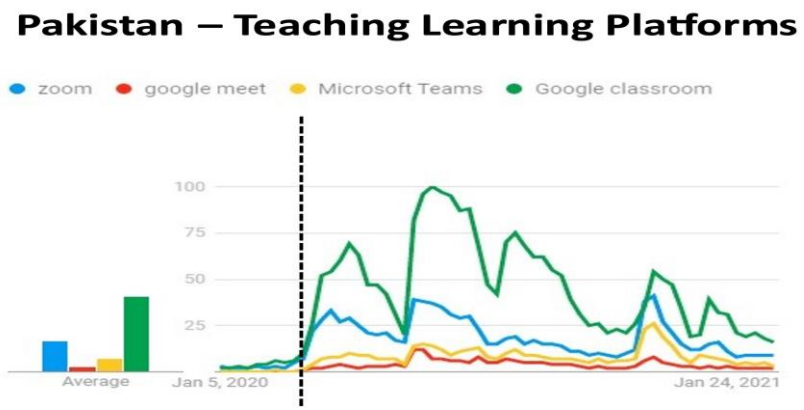
Figure 5: World -Comparison of Teaching Platforms



Source: Google Trend, 2021.

The figure 5 shows that the world- comparison of teaching platforms in terms of Zoom, Google meet, Microsoft teams, and Google classroom. This graph clearly shows that the all mentioned above teaching platforms before 5 Jan 2020 was not much used but after that rapidly change or shift. Moreover, on world level Zoom is the platform that was much used 100% as compared to other platforms, google classroom less than 75%. Similarly, Microsoft teams and Google meet less than 25%. This graph also indicates that this flow of changed with the passage of time and till the Jan 24, 2021, all platforms reached less than 50% in all over the world.

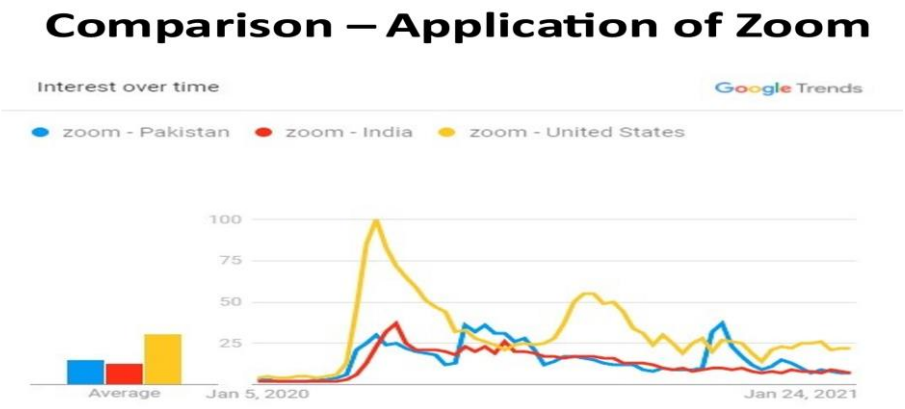
Figure 6: Pakistan – Teaching Learning Platforms



Source: Google Trend, 2021.

The figure 6 shows that the Pakistan- Teaching Learning platforms in terms of Zoom, Google meet, Microsoft teams, and Google classroom. This graph clearly shows that all mentioned above teaching platforms before 5 Jan 2020 was not much used but after that rapidly change or shift. Moreover, in Pakistan Google Classroom is the platform that was much used 100% as compared to other platforms, than zoom above 25%. Similarly, Microsoft teams and Google meet less than 25%. This graph also indicates that this flow of changed with the passage of time decreased and till the Jan 24, 2021, all platforms reached less than 25% in Pakistan.

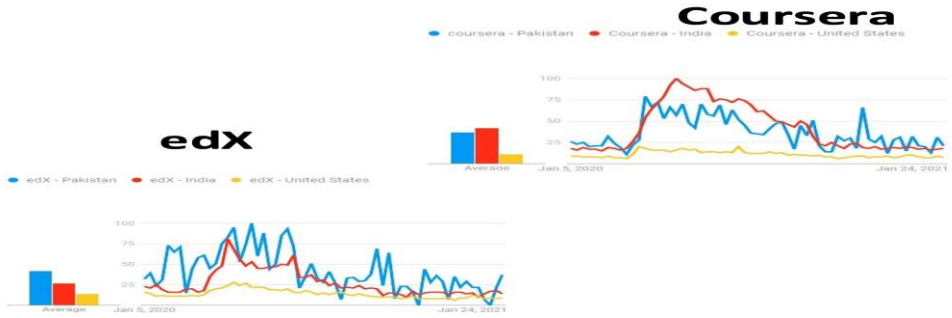
Figure 7: Comparison – Application of Zoom



Source: Google Trend, 2021.

The figure 8 shows that the world- comparison – Application of Zoom, in different countries. This graph clearly shows that the all mentioned above comparison application of zoom before 5 Jan 2020 was not much used in Pakistan, India and even in USA, but after that rapidly change or shift. Moreover, Zoom application that was much used 100% in USA as compared to Pakistan and India. This graph also indicates that this flow of changed or shift with the passage of time decreased and till the Jan 24, 2021, the use of zoom application in three different countries less than 25%.

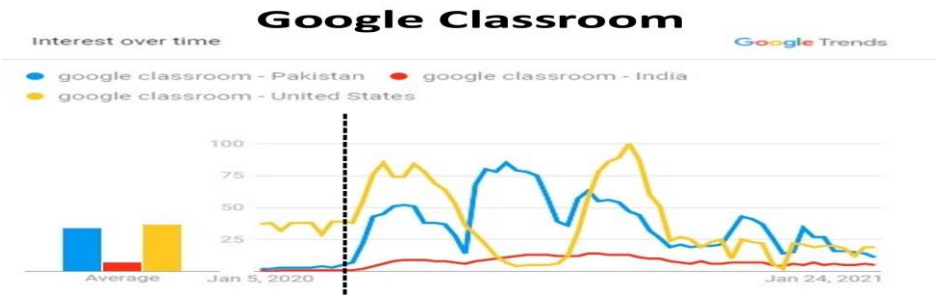
Figure 8: Application of Coursera and EDX



Source: Google Trend, 2021.

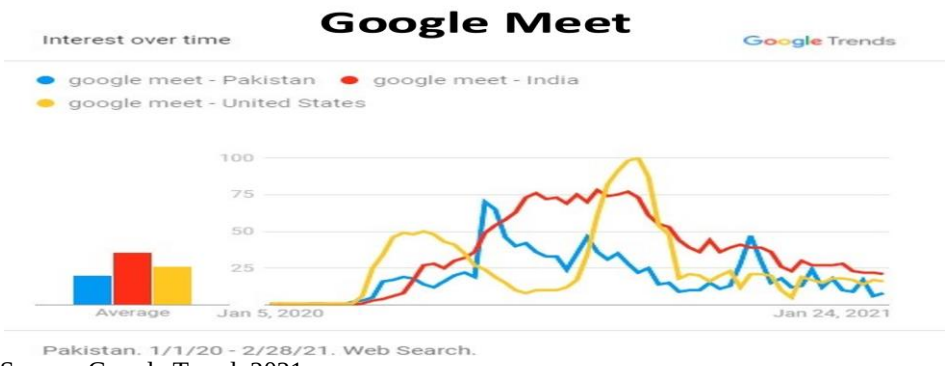
The figure 9 shows that the world- comparison – Application of Coursera and edX in different countries. This graph clearly shows that the above-mentioned comparison application of coursera and edX before 5 Jan 2020 was not much used in Pakistan, India and even in USA, but after that rapidly change or shift. Moreover, coursera application that was much used 100% in India as compared to Pakistan and USA. This graph also indicates that this flow of changed or shift with the passage of time decreased and till the Jan 24, 2021, the use of coursera application in three different countries less than 25% in India and Pakistan but in USA was 25%. Similarly, the edX applications that was much used in Pakistan, then India and then USA.

Figure 9: Application of Google Classroom



The figure 10 shows that the Application of Google Classroom usage in different countries. This graph clearly shows that the above-mentioned comparison application of google classroom before 5 Jan 2020 was not much used in Pakistan, India and even in USA, but after that rapidly change or shift. Moreover, google classroom application that was much used 75% - 100% in USA as compared to Pakistan and India. This graph also indicates that this flow of changed or shift with the passage of time in zig-zag flow and till the Jan 24, 2021, the use of google classroom application in three different countries less than 25% in India Pakistan and even in USA.

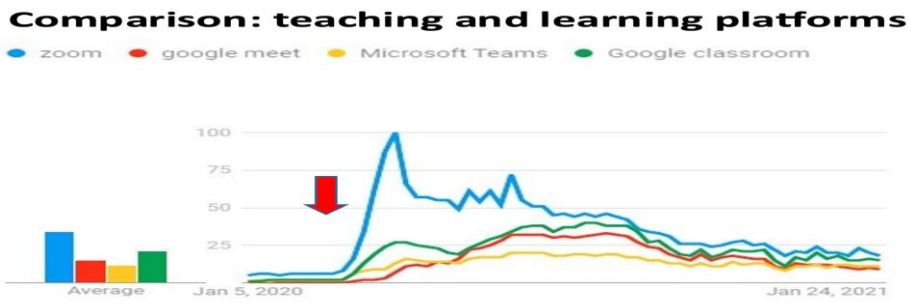
Figure 10: Application of Google Meet



Source: Google Trend, 2021.

The figure 11 shows that the Application of Google Meet usage in different countries. This graph clearly shows that the above-mentioned comparison application of google meet before 5 Jan 2020 was not much used in Pakistan, India and even in USA, but after that rapidly change or shift. Moreover, google meet application that was much used 100% in USA as compared to Pakistan and India. This graph also indicates that this flow of changed or shift with the passage of time in zig-zag flow and till the Jan 24, 2021, the use of google meet application in three different countries less than 25% in India Pakistan and even in USA.

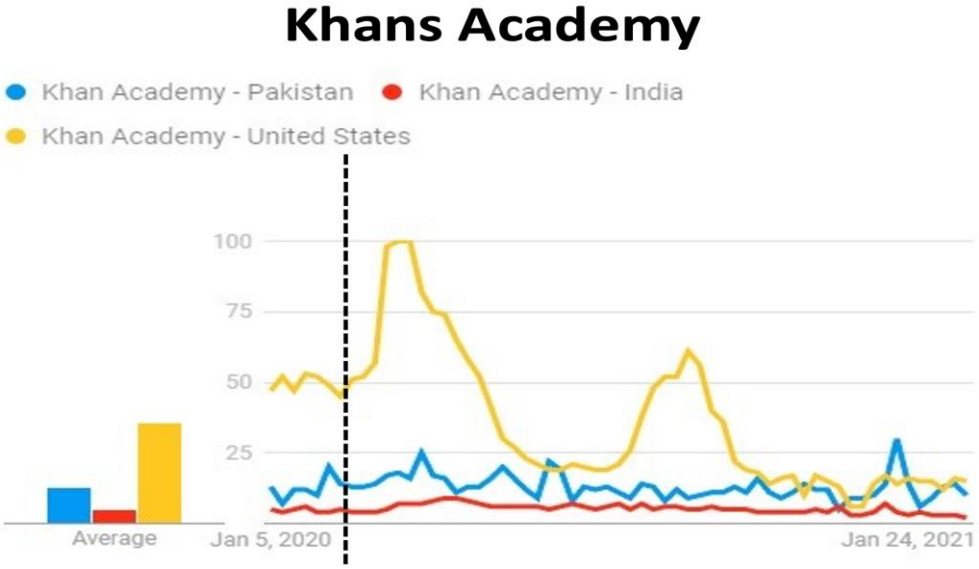
Figure 11: Comparison: Teaching and Learning Platforms



Source: Google Trend, 2021.

The figure 12 shows that the use of application such as zoom, google meet, Microsoft teams and google classroom, comparison: in teaching and learning platforms in different countries. This graph clearly shows that the above-mentioned applications in teaching and learning before 5 Jan 2020 was not much used all over the world, but after that rapidly change or shift. Moreover, zoom application that was much used 100% in teaching and learning in all over the world as compared to other applications. This graph also indicates that this flow of changed or shift with the passage of time and till the Jan 24, 2021, the usage of all applications less than 25% in all over the world.

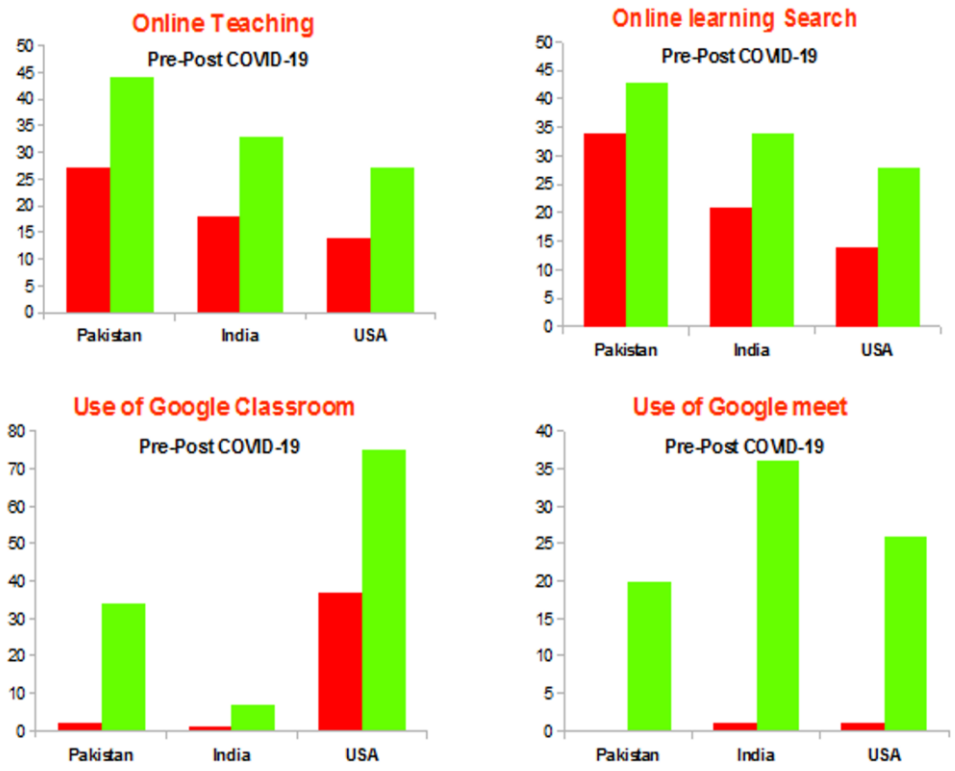
Figure 12: Khans Academy



Source: Google Trend, 2021.

This graph shows that the use of Khans Academy in different countries. This graph clearly shows that the above-mentioned free online tool that created by Salman Khan in 2008, before 5 Jan 2020 10%-50% was used in Pakistan, India and USA, but after that rapidly change or shift. Moreover, Khan Academy that was much used 100% in USA as compared to Pakistan and India. This graph also indicates that this flow of changed or shift with the passage of time and till the Jan 24, 2021, the usage of all applications less than 25% in all over the world.

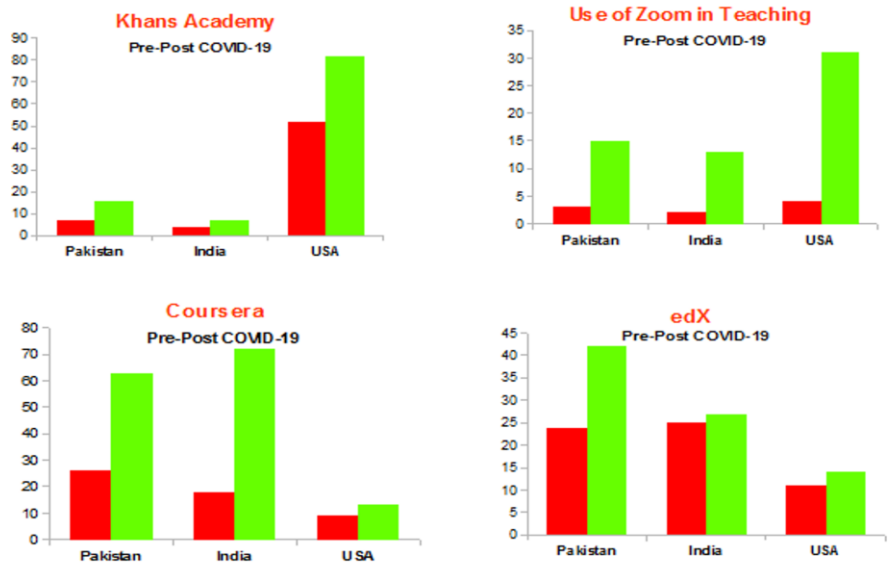
Figure 13:Pre-Post Covid-19 Effects in Teaching And Learning



Source: Google Trend, n.d.

The red colour indicates pre covid-19 and the green colour indicates post covid-19. These tables reveals that the term online teaching searched more in Pakistan then India and then USA, in both conditions' pre-post Covid-19. In addition, the term online learning searched more in Pakistan then India and then USA, in both conditions' pre-post Covid-19. Further, the use of technology application Google classroom more used in USA, then Pakistan and then India, in both conditions' pre-post Covid-19. Moreover, the use of technology application Google meet more used in India and then USA, in both conditions pre-post Covid-19. But in Pakistan the use of technology application Google meet not used in pre-covid 19 but after that approximately 20%, people of Pakistani used this application.

Figure 14: Pre and Post Covid-19 Effects on Teaching and Learning

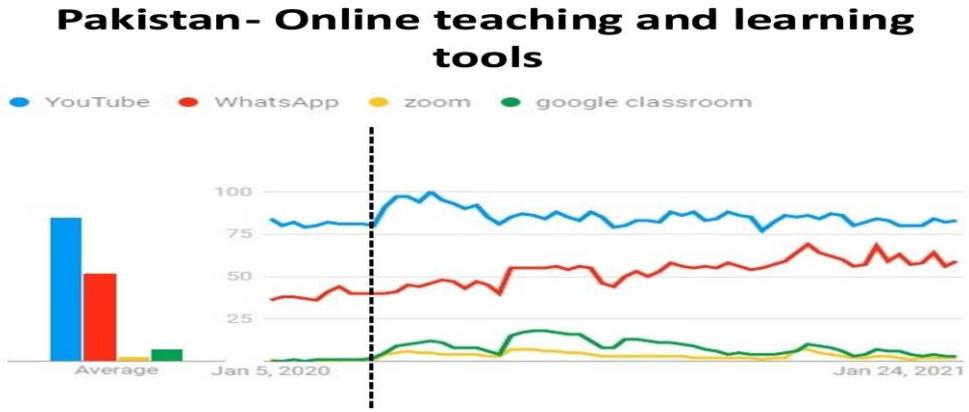


Source: Google Trend, 2021.

The red colour indicates pre covid-19 and the green colour indicates post covid-19. These tables reveals that the use of Khans Acadmy more in USA then Pakistan and then Inda, in both conditions' pre-post Covid-19. In addition, the use of zoom in teaching more in USA then Pakistan and then India, in both conditions' pre-post Covid-19. Further, the use of technology application Coursera more in India, then Pakistan and then USA, in both conditions' pre-post Covid-19. Moreover, the use of technology application edX more in Pakistan, then India and then USA in both conditions pre-post Covid-19.

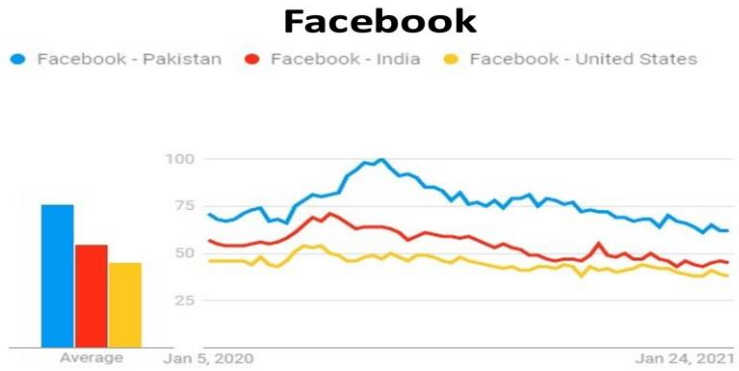
The graph 15shows that the in Pakistan different technological tools are using for the purpose of teaching and learning such as YouTube, WhatsApp, Zoom and Google Classroom. Therefore, this graph clearly indicates that before the five January 2020 these technologies were using for the purpose of teaching and learning as graph shows the figures less than 100% YouTube were using for the purpose of teaching and learning, less that 50% WhatsApp were using for the purpose of teaching and learning, and 0.1% zoom and google classroom, were using for the purpose of teaching and learning in Pakistan. But after that the shift increased for few months but again this flow of changed or shift with the passage of time decline and till the Jan 24, 2021, the usage of all these technologies for the purpose of teaching and learning in Pakistan ,YouTube less than 100%, WhatsApp less than 75%, and zoom and google classroom less than 25%.

Figure 15: Online Teaching and Learning Tools in Pakistan



Source: Google Trend, 2021.

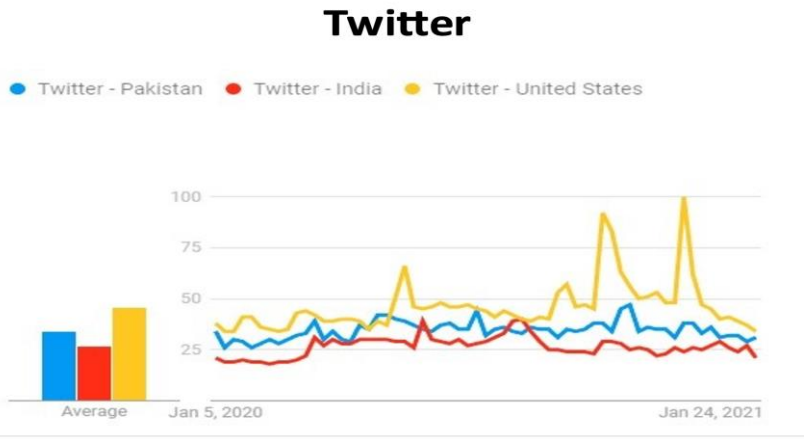
Figure 16: Comparison of three countries- the use of technology



Source: Google Trend, 2021.

This graph shows the world comparison technology usage before Jan 5,2020. In Pakistan people were using Facebook less than 75%, in India more than 50% and in USA less than 50%. But with the passage of time during covid-19 and after 5 Jan 2020 the use of this technology increased in all three mentioned countries. Pakistan is the country where people were using Facebook 100% as compared to other countries like India and USA.

Figure 17: World Comparison-Use of Technology

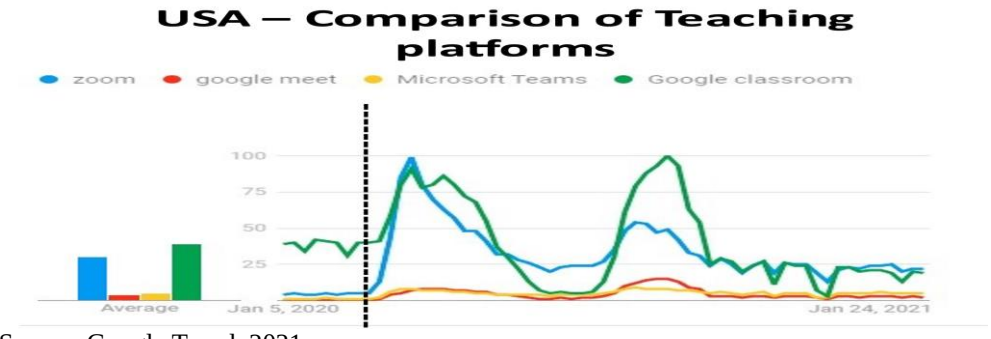


Source: Google Trend, 2021.

This graph shows the world comparison technology usage before Jan 5 ,2020, in Pakistan, India and USA people were using Twitter less than 50%. But with the passage of time during covid-19 and after 5 Jan 2020 the use of this technology increased more in USA where people were using Twitter 100% as compared to other countries like Pakistan and India.

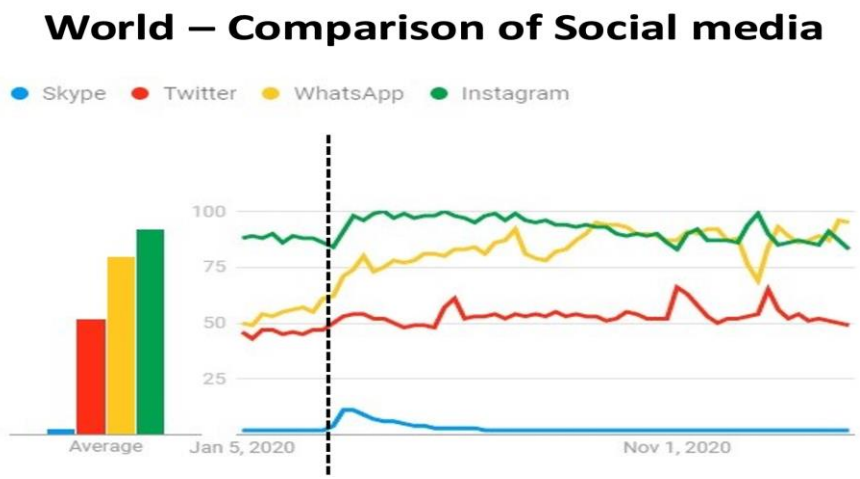
The above graph shows the USA comparison use of technology applications in teaching and learning, before Jan 5 ,2020, in USA people were using these technology applications less than 50%. But with the passage of time after 5 Jan 2020, Zoom and Google classroom were using 100% in teaching platforms in USA and Microsoft Teams and Google meet not much in used before Jan 5, 2020 to till Jan 24, 2021.

Figure 18: USA-Comparison-Use of Technology Application In Teaching And Learning Platforms



Source: Google Trend, 2021.

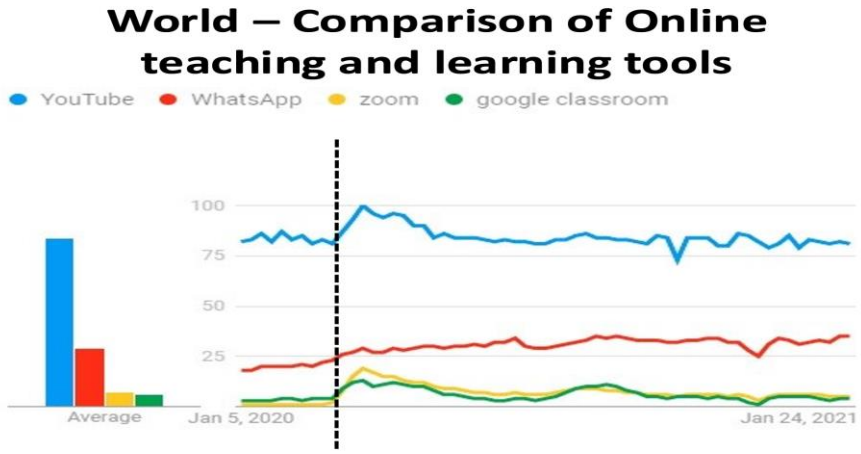
Figure 19: World Comparison of Social Media



Source: Google Trend, 2021.

This graph shows the world comparison use of social media before Jan 5 ,2020, people were using Skype, Twitter, WhatsApp, and Instagram less than 100% all over the world. But with the passage of time during covid and after 5 Jan 2020 the use of social media increased in all over the world. Moreover, in all over the world Instagram people were using 100%, WhatsApp approximately 99%, Twitter 50% -70% and Skype 10%-0% till the Nov 2020.

Figure 19.1: World Comparison of Online Teaching and Learning Tools



Source: Google Trend, 2021.

This graph shows the world comparison of online teaching and learning tools before Jan 5 ,2020, people were using YouTube, WhatsApp, Zoom and Google classroom less than 100% all over the world. But with the passage of time and after 5 Jan 2020 the use of online teaching and learning tools increased in all over the world. Moreover, in all over the world YouTube people were using 100%, WhatsApp approximately 40%, zoom and Google classroom less than 25% till the Jan 24, 2021.

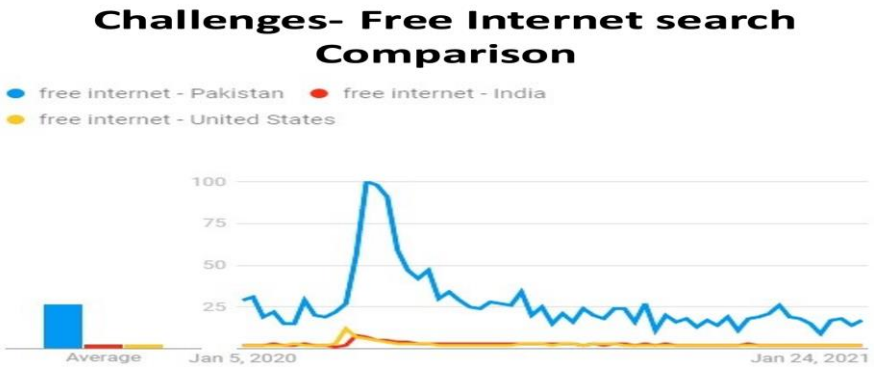
Figure 20: Challenges in the free access



Source: Google Trend, 2021.

This graph shows the world challenges in terms of free courses, free books and free internet before March 1 ,2020, these challenges were rare but after that the biggest challenge people faced free internet 100% as compared to free books and free courses 25%-30%. Moreover, this graph also indicates that in all over the world these challenges decreased and reached less than 25% till the August 30, 2020.

Figure 21: Challenges-Comparison of Search for free internet



Source: Google Trend, 2021.

This graph number 20 shows the challenges- free internet search in Pakistan, India and USA, before Jan 5, 2020, these challenges were rare in these mentioned countries but after that rapidly change especially in Pakistan people were searching for free internet more as compared to India and USA. 100% Pakistan, and less than 10% in India and USA. Moreover, this graph also indicates that the above-mentioned countries searching for free internet decreased and reached less than 25% till the JAN 24, 2021.

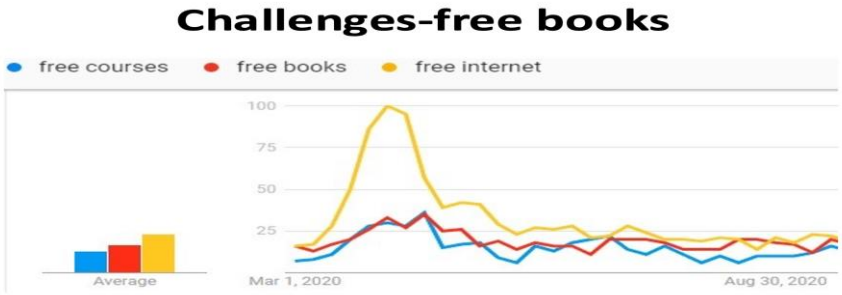
Figure 22: Challenges-Search for free internet in Pakistan



Source: Google Trend, n.d.

This graph shows the challenges- free internet search within Pakistan, Azad Jammu and Kashmir is the area where free internet searched more 100%, than in Punjab and Baluchistan 97%, than Khyber Pakhtunkhwa 91% and Islamabad Capital Territory 83% only.

Figure 23: Challenges- Search for online free books, courses and internet in Pakistan



Source: Google Trend, 2021.

This graph shows the challenges- free courses, free books and free internet search in Pakistan, before March 1, 2020, these challenges were rare or less than 25%, but after that rapidly change especially in free internet search, where people were searching for free internet more or 100% as compared to free course and free books, approximately 30%. Moreover, this graph also indicates that the above-mentioned searching for free internet decreased and reached less than 25% till the 30 Aug 2020.

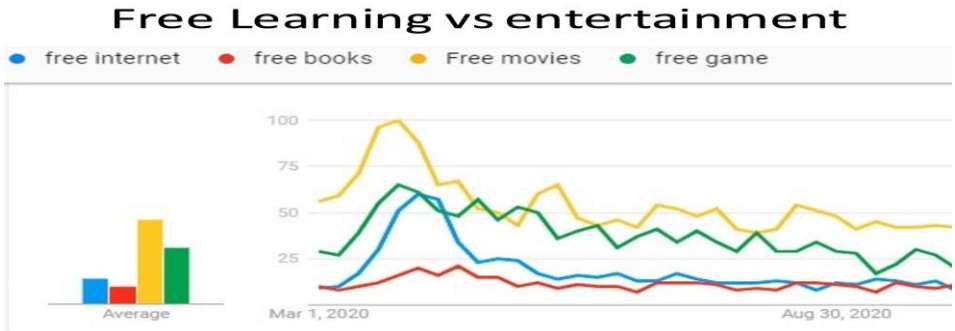
Figure 24: Challenges- Search for online free books in different regions of Pakistan



Source: Google Trend, 2021

This graph shows the challenges- free books search within Pakistan. Gilgit-Baltistan is the area where free books searched more 100%, then Khyber Pakhtunkhwa 75% , then Azad Jammu and Kashmir 74%, then Islamabad Capital Territory 73%, and the last one Balochistan 73% .

Figure 25: Comparison of Free learning and entertainment in Pakistan



Source: Google Trend, 2020.

This graph shows the free learning vs entertainment search comparison in the following learning and entertainments tools in Pakistan. According to this graph before March 1st,

2020, people were using all these tools, but free movies searched high 50% and with the passage of time this percentage increased and reached 100% and this this very high parentage as compared to free books less then 25%. Similarly, people in Pakistan were more searching free games and free internet as compared to free books. Moreover, this graph also indicates that after the March 1st, 2020 to August 30, 2020, people were more inclined to search free entertainment tools as compared to free learning tools.

Figure 26: Search on internet for free Games in different regions of Pakistan



Source: Google Trend, 2021

This graph shows the free games search comparison in Pakistan. Balochistan is the area where free games searched more 100%, then Sindh 99%, then Islamabad Capital Territory 94%, then Punjab 89%, and the last one Gilgit-Baltistan 87%.

Figure 27: Search on internet for free Movies in different regions of Pakistan



Source: Google Trend, 2021

This graph shows the free movies search comparison in Pakistan Gilgit-Baltistan is the area where free movies searched more 100%, then Punjab 96%, then Balochistan 94%, then Sindh 93%, and the last one Islamabad 89%. Therefore, the people in Pakistan were more engaged in entertainment activities as compared to learning activities.

Table 1: Quantitative Analysis: Inferential statisticsT-test

	T- test (P-Values)
Covid-19	0.034*
Coursera	0.050*
Distance Learning	0.105
Facebook	0.395
Google meet	0.005**
Online Learning	0.008**
Online Teaching	0.003**
Twitter	0.010*
WhatsApp	0.086
YouTube	0.033*
Zoom	0.042*

The above data reveals the statistical results of t-test (P-values), The word covid-19 searched score is 0.034, the word Coursera searched score is 0.050, the word Google meet searched score is 0.005, the word online learning searched score is 0.0008, the word online teaching searched score is 0.003, these values are lower than 0.05. This is statistically significant. Additionally, the use of technology applications for the purpose of teaching and learning, Twitter statistical score is 0.010, YouTube score is 0.033 and the Zoom score is 0.42, these values are less than 0.05 and this is statistically significant.
Moreover, this table also indicates the statistical results of t-test (P-values), the score of Distance learning is 0.105, the score of Facebook is 0.395, and the score of WhatsApp is 0.086 these values are greater than 0.05 and these scores are not statistically significant.

Hypotheses Testing

Therefore, we reject the null hypothesis ($H_0$1) and retain the alternative hypothesis (H_a1) that there is a paradigm shift in higher education as a result of COVID-19 Pandemic. Similarly we on the basis of P-value we also reject the second null hypothesis ($H_0$2) and consequently we retain the alternative hypothesis (H_a2) that there is a significant change in the use of technology in higher education in pre and post COVID-19 era.

5. DISCUSSION AND CONCLUSION

Most of the students struggled hugely due to the internet providers' low quality and connectivity issues throughout Pakistan. The challenges of the 'transition of the existing face-to-face teaching system to embrace the digital education method adequately says, (Bhamani et al., 2020). Yancy (2020), says that, It would be positive step to learn how higher educational institutions universally have prepared themselves for shifting their

education to the digital platform during and after the Covid-19. According to Ali (2021) the findings of his paper the participants were more agreed that the quality of online learning has increased in the online educational system during the covid-19. Additionally, participants were feeling more comfortable in online classes as compared to physical classes and the participants of the UAE agreed that online through online education they can manage or balance family and work more easily. Therefore on the bases of finding it is concluded that despite of extreme challenges faced by people all over the world, the online paradigm shift in education is evident during Covid-19 period. It is also safe to conclude that COVID-19 pandemic has proved as a source of Paradigm Shift in Higher education. Furthermore a significant change in the use of technology in higher education in pre and post COVID-19 era has been observed.

This grand shift has paved the way for a transformation of higher education from on-campus to online mode and promoted the virtual learning model. Ultimately COVID-19 pandemic was a blessing in disguise as it has resulted in more technology reliance in higher education.

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