Effectiveness of Online Education over Traditional Education System during COVID 19 – An analysis

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ABSTRACT

Online Education System is becoming more relevant especially in the times of Coronavirus(COVID-19). However, the retention of students in MOOCs and distance learning universities is significantly lower(1/4th) than the traditional educational system. The low retention of students is harmful to both the university and the students. Several studies have tried to address this issue but they rely on the study by psychologists to assess motivation and intent. The fundamental purpose of this study is to identify the motivational factors and engagement behavior impacting the retention of a student on such platforms. The interaction with faculty and mentors also play a significant role in the retention of the student. The data will be collected from external sources as well as surveys from students telling their reasons for factors in their retention. Significant factors are to be identified and prepared. The model will predict the retention of the student. This study will provide insight into solutions to increase retention among students in a virtual learning environment.

Introduction

The coronavirus is a once in century pandemic which has affected everyone's life. It has created a situation of economic crunch and people have shortage of money to spend. With the cost of education increasing over the past few years, students are reconsidering their investment and are looking for better opportunities. Many people have lesser money to spend on education and are not joining the educational institutions as they had earlier planned before the pandemic. During the 2008 economic recession, people lost jobs as well and wanted to improve their career which led to an increase in the enrolment in online platform for education which was a positive sign [1]. Online courses are courses in which eighty percent of the learning is delivered without interaction face to face. Whereas traditional education is defined as learning imparted through interactions when students and teachers meet face to face [2]. Programs based on online education are existing in some way or the other [3]. Online education may generate more meaningful outcomes as compared to traditional education [4]. There have a been a lot of job cuts and more and more people are getting unemployed. People need to keep having income and if they had money to spend money of learning, they would invest that on online learning [5]. This has created a need for reskilling and upskilling to sustain in this economic turmoil.

During this period of COVID 19 schools and colleges are shifting to virtual classes. This is new way of teaching is now a compulsion. Colleges and institutions are trying to provide laptops or internet hotspots of students who are in need financially [5]. There has been massive technological advancement in the digital space over the past few years. With this new education system, students can keep a better track of their progress and gain knowledge with more depth, clarity and understanding at their own pace.

Literature Review

The education system has made advancements along with the digital revolution with many online educational platforms being set up and run successfully like Coursera, edX, Udemy etc. These platforms do provide knowledge and at much lesser price along with certificates of learning. Usually most of the courses are from area of computer science [6]. But these do not provide full time degrees and interactions which full time courses do provide. MOOCs have the ability to make a broad impact on the educational system [7]. These courses are way to remove inequality where richer people are unable to afford institution fees whereas people from un-wealthy background have the equal opportunity to learn [8]. They have been successful and quite popular. MOOCs are available in around 190 countries [6]. MOOCs will be an essential supplement of traditional courses rather than a replacement for the goal of quality teaching in higher education [8]. There is a hope of providing world class quality education to everyone having access to internet [9]. But the retention of students in these courses has been quite low due to lack of motivation and focus from students enrolled in these online courses. However, with the pandemic affecting the lives of people Coursera is having collaborations with various educational institutions affected by the pandemic to provide free education and certificates to students to help them recover and grow despite the pandemic and its effects. There has been a tremendous increase in the use of the Courera platform during the pandemic [5]. Another platform edX which has collaborations with Harvard and MIT is also providing free knowledge to students affected by the pandemic all over the world. Many institutions have increased the courses they offer online as increasing number of students are in favor of online courses [2]. With these

platforms providing courses to students free of costs and also the students having more free time to explore other options due to vacation and temporary shutdowns of educational institutions, these courses have become more and more popular and a favorable choice among students to gain knowledge and skill with the ease of staying at home and progressing at self-defined pace which is more comfortable and suitable to students as every individual has different learning speed and comfort level in different subjects. It is anticipated that online education will continue to grow in presence through changes in structure, shapes and formats [1].

With more and more students doing such courses and training online, a study can be done over effectiveness of such programs over traditional courses and what the online platforms can do to increase the retention of students over such platforms. Effective learning needs effective system of delivery of education [10]. About ninety percent of studies on online education found that online education is as effective as traditional education or even more effective, however the result is not conclusive [9]. Students in traditional courses get better assignment scores and overall grade as compared to students in online course [3]. It will also help us to understand how the pandemic affects the retention rates of the such MOOC courses and online platforms. This will help us pave way into the future of how these platforms can impact the traditional educational system. Dhawal Shah, whose website Class Central writes about massive open online courses and points potential students to the free, non-credit classes, reported that it had 5.4 million users in March, up from 490,000 in February [5]. There is no study as of now o*f how educational retention has* increased in COVID 19 scenario and what effect it is having on the career of the students as compared to earlier when the traditional full time education system was more preferred. Earlier studies were solely based on MOOCs retention of students and analysis on why and when students leave the course and what impact does it have on the student lives. Also there have been ideas and suggestions provided of how to increase student retention based on psychological and motivation factors. Earlier the motivation for students to complete such courses was different and it has now changed with the pandemic affecting the lives of students in multiple ways. There is not enough data readily available for free of students who have actually enrolled or completed these online courses. This will provide a unique way of analysis in which we will have data of students who have studied both traditionally and online. The increase in the popularity of online education has made it accessible to everyone and the authenticity and credibility of online education has always been a concern as well. It is a great opportunity for us to analyse importance of such educational platforms in transforming knowledge of students. We can compare the two and look at the pros and cons and get an idea of what the students feel. Which is having a better impact on their learning and career? Students can provide information of what they feel is working for them or what is not working for them. What suggestions for improvements in the ongoing system can be implemented to better align the courses and curriculum so that they stay relevant with time? Feedback to the instructor is considered to be an essential hallmark for both traditional and online education [3]. This way of feedback will help narrow the gap between the conception of the students and experts [8].

Which education is more impactful and better with the pandemic at hand? With the changing trends we have seen new streams and specializations being added to bachelors and masters programs to meet the demands and interests of students like systems, IT, analytics, healthcare being added to masters programs and mechatronics, agricultural, petroleum, biomedical, forest etc. to the bachelors programs. Also there is a difference in the level of investment between online and traditional education system. The completion rates differ as well with traditional educational system having much higher rates as compared to online education. The success in career is also higher for full time students with more companies visiting campuses for hiring future talent. This study will help us find answers to how much of the education can change in the future? Earlier studies do not help us understand the whole story especially with the pandemic at hand now. We will go into more depth with statistical analysis and try to find impact while also taking data available from MOOCs easily available online as well from students who enrol into these courses.

Research Methodology

A. Methodological Approach: The main purpose of the study is to gain more understanding on the impact of pandemic on educational system.

The survey will be a quantitative study for which we will collect primary data ourselves. However, the interview will be more of a qualitative study which will help us draw conclusion. But we shall take into account the bias of the person as this can be heavily impactful in our case.

Will such questions help us to understand the good and bad of both the modes of learning? We will need to find some pattern and do some statistical analysis on the data we will capture from the above mentioned process.

B. Methods of Data Collection: We will take survey to gather data first hand from students. We know by this that the data will be reliable and we can analysis on that. We will float several questions on the survey about online vs traditional education and what they find useful and how much and what recommendation they would like to give for a better experience. The pre survey and post survey helps in reducing bias in different groups [7]. The questions take the form of Likert Scale with scale of 1 to 7. 1-7 indicating the level of importance. We need to know people opinion especially students whose life is impacted with the educational system. If we know and understand the students better, we can come up with recommendations. We will target student form MBA colleges as well as Bachelor college where more of a technical education is granted. We will try to understand if these courses have made their understanding better or they were a lot cumbersome or unnecessary as they were already enrolled in full time education. They can provide recommendation for online courses which could be better curated and also recommendation for full time education and how they can stay more relevant. How much these courses are helping the students to upskill themselves in this situation of the coronavirus pandemic. We will also target working professionals who might have lost their job or have been

impacted due to the pandemic. Also we will try to find can such courses help them to reskill and look for job that might be available in the market.

We will also do structural interview from a student who is doing online distance education (degree course) in an evolving new field. He has already done full time education earlier. We will ask him questions about his experience and what he thinks is more suitable for him.

Questions will be related to his experience while doing online education, out of the two which has helped him to gain more knowledge and skills, which has a better return on investment in terms of money and time, which one will have better long term prospect for him career-wise, satisfaction level on the two types learning modes, etc. The interview is aimed to be of 20 minutes and we will observe his opinion on our topic at hand. The will be a great in depth analysis on top of the survey data we have gathered. We can check if the survey results align with the interview explanations. The observations can tell a story in great detail and how actually the person feels relating to the two courses.

Also we take into account some secondary data for analysis. This data will provide with the satisfaction level of the students in the times of pandemic. How the students actually perform when they are to face. Where the focus of the students is and how much they are willing to learn and invest for themselves especially when the times are to testing and the focus of every individual to earn and feed their mouth and look out for the family in the future. This data can be collected with the increase in the rating, or popularity increase of some courses, some change in skill demanded by the industry in order to adapt to a new normal. We will also need to understand how the companies are adapting these online courses in their learning and development of their employees which is of much increased importance in the times of the pandemic. Instead of send their employees of colleges for a training stint, do these companies now resort to online courses and the growing popularity of such courses due the ease of time and money. The secondary data can give a new insight which might not be present in the data that we are collecting since our sample data might be restricted to students of India and those who are studying in colleges as well for they education. We can see the example of some students who have improved their career through informal education and are earning good money. We will look at the research of people who get jobs in firms which are technologically advanced and how they fair in forums and portals and if studying online in MOOCs i.e. online courses affected their success. These stories will also tell us if these results are based on pure talent or skill which they have acquired through online education and courses on platforms we are researching on.

C. Methods of Analysis: The data we gather from the survey is of demographic nature which will help us in making segmentations of students who are doing the courses. Then the data which we have taken for the motivational factors are ordinal in nature have lower limit of one and an upper limit of seven. We will do some clustering algorithm as well which comes under unsupervised machine learning. We will use K-Means clustering in particular to make segments of students so that we can understand the pattern of such individuals and how they are likely to behave and respond to different learning styles. For this we will have to define the number of clusters. For simplicity we will take only four clusters. This will help us better target them. The data points of individuals in the clusters will have certain similarities to other individuals in their own cluster. Through this we can derive different conclusions for different type of students. This is also supported by the fact that all individuals are unique and have different learning patters. We can also do some predictive analytics in that we can find if students are can better perform in either of the modes of learning or some changes in type or parameters can increase their satisfaction level or learning curve for a better future for them.

D. Evaluation and justification of methodological choices: Questions relating to the pandemic and how many online courses have they enrolled in, how many courses they were able to complete, their age, their specialization of masters or bachelors program, all these give an idea of the diversity of the student and the success parameters.

Other questions asked the basis of selection of courses and how they were able to complete the course. Did the course design affect their course completion, did the course had to be from reputable institute with a high rating, did the course being relevant to their interest played a role in completion of course, what was the duration of course, was support provided by course, etc. The videos on Coursera are of duration of eight to ten minutes with a short quiz to help students have retention of the topics discussed [8]. Whereas traditional education classes are of much longer duration.

Some questions related to the student's motivation were also asked like what was the main reason for pursuing the course for the student. Some students complete the courses to showcase their skills in the CV or in an online profile, did they take the course for the knowledge gain purpose only, was it made compulsory by college, or did they pursue the course out of interest and curiosity in a particular field. Their feelings regarding necessity of the course and utilization of time while completing the course. Was the course taking too much time for completion. Also a comparison whether which mode of learning was more effective to them in terms of gaining knowledge and skills was asked. How the students feel about face to face interaction which might be compromised in online education via MOOCs. What are the perspectives of the students for better career opportunities when comparing the two modes of education? Also we try to understand if students feel that a degree is more beneficial to them long term or not. How the students have been utilizing time during this pandemic and did they gain knowledge and skills, do these courses consume too much time and if they are worth it. These questions will give us an idea of what the students think about the courses online as compared to traditional education.

From the interview we might get some explanations of the findings we will be getting from our data analysis that we will be doing. Through this we will also get some domain knowledge on this subject and what are variables, thresholds in many variable, the significance level of certain variables.

Results and Analysis

For our sample 66 percent of the students were between the age 25-27. Rest 34% were with varying age ranges from 20-24 and 27-30. The students have some experience of working in an industry prior to joining the traditional course.

The 20-24 and 27-30 age ranges have 18 percent and 16 percent students respectively.

Looking at the specialization of the students, we see that 54% of the students need strong technical foundation and knowledge for their careers. The technical foundation being spoken of is the necessary prowess in using certain software which is expected in the market like Python, SQL, Tableau, Power BI, etc.

When we asked the students about the courses that they have taken online, the majority of the students had taken 2 courses which is 28 percent of the sample. Surprisingly, 8 percent of the students had not taken or enrolled in any of the online courses till date. 10 percent of the students had taken one course. Again, 10 percent of the students had taken 3 courses. 15 percent of the students had taken 4 courses. 8 percent had taken 5 courses. But around 20 percent of the students had taken 6 or more courses online during the pandemic.

Then we asked about the completion of courses as we are interested in factors affecting completion of such courses as well. Again, the 28 percent had completed 2 courses. Students completing no courses or one course had similar share with 21 percent each. Only 7 percent of the students were able to complete 6 or more courses. A meagre 3 percent of the students were able to complete 5 courses. Around 20 percent were able to complete either 3 or 4 number of courses.

After that we started investigating the factors which might have affected their course completion rate. Majority of the students agreed that the course design was very important for them to complete the course with 89 percent of the sample population marking it 'slightly important to highly important'. 20 percent rated it 'slightly important', 31 percent rated it important and 38 percent rated it 'highly important'. There were 5 percent neutral responses and 5 percent said that it was 'highly unimportant' for them.

We proceeded to ask if the course being from a reputable institute affected their probability of completing the course. Again, it was highly skewed with most participants agreeing that it was an important factor. With around 75 percent of the students in favor. 26 percent students rated 'slightly important', 20 percent rated 'important', and 28 percent rated 'very important'. Neutral responses were 13 percent. 8 percent said 'slightly unimportant' while 5 percent said 'very unimportant'.

Then the question was about if the rating of the courses on the platform on which they are pursuing affects their selection and completion of the course. It was observed that most students tend to favor courses with high rating. 56 percent of the students said that they preferred high rating courses with a section of 28 percent of the sample each rating it highly important and important respectively. 18 percent said it was slightly important while 10 percent were neutral. 10 percent said that it was slightly unimportant, while 6 percent said it was unimportant or very unimportant.

Then we considered if interest in the subject played a role. Most of the students said it was very important with 54 percent of the students saying so. 28 percent said it as important while 10 percent said it was slightly important.

Many students were in favor of courses requiring a shorter time period. 67 percent of the students said that the duration and time consumed was quite a significant factor as well in completion of the course online. 20 percent sad that it was 'slightly important' factor. 13 percent said that it did not affect them much in regards to their probability of course completion.

We tried to see how much support provided by the courses affected the student's completion of the course MOOCs are successful mainly because of participation of students in discussion boards and forums [6]. Their participation in discussion forums and how much it affected the success of the course. 23 percent were neutral for the participation. 31 percent said that it was important while 18 percent each said it was slightly and very important respectively. Around 10 percent of the students considered it as unimportant.

Students undergoing online education experience remoteness and contemplation due to less interaction with their instructor [10]. We asked about the motivational factors for pursuing an online course. The main reason came out to be 'Gaining Knowledge'. There were other motivational factors as well. The second highest factor came out to be 'interest in a particular field that they had earlier.' The 3rd most important factor came out was 'Getting Certificates for LinkedIn or Resume'. The least important factor was that it was mandated by the college to complete it and was put in as a credit course.

Then we did a comparative analysis of online classes vs the traditional classes. 26 percent students were neutral or indecisive on which mode of learning provided better knowledge. While other 26 percent strongly agreed that they gained more knowledge in traditional/offline education system. 28 percent of the students said that they preferred online education to gain knowledge as compared to offline education. We asked the students whether they were more invested in one of the modes. 29 percent of the students agreed on a scale of 1 to 7 with a rating of 6 that their time was better invested while doing these online classes. 15 percent of the students were neutral on the subject.

We asked about face to face interaction which is not prevalent in online courses and MOOCs. Students said that it was an important factor for them as well. 65 percent of the students said that peer interaction is important for learning and that online courses failed to do so. 13 percent of the students stayed neutral while 22 percent of the students had no problem with lack of peer interaction in such courses which has a lesser face time.

While asking about which education mode provides the students with better career opportunities, most students favored traditional education. Around 25.5 percent each considered traditional education as 'very important and 'important' over online education respectively. 18 percent students stayed neutral in this case and 13 percent traditional education is slightly more preferred over online education. Whereas a meagre 18 percent preferred online education over traditional education in varying levels of importance.

However, when we just talk about the online courses during the pandemic period, students said that these courses helped them gain a lot of knowledge and skill with 64 percent of the students supporting the claim. Also, 25 percent of the students were neutral on this issue of gaining knowledge in the pandemic period through online courses. Moreover, when asked about the consumption of time by the courses to complete the courses, 61 percent students said that this was not an issue for them for learning through an online course,

further stating that these courses were definitely worth their time. Doing a structural interview provided in depth knowledge on some of the topics. When asked about the student experience and what was more suitable for them, the students said that being in a traditional mode of study provided them with a lot of opportunity to learn and interact with peers. Their experience with traditional education was more preferred over online education. When it came to gaining knowledge and skill the students still preferred traditional education as it created an environment for them to learn and study. It made them go back and learn the concepts so that they can stay on track with the class on subjects and topics learnt. There was more of a motivation for them to go back learn and develop skills. When talked about return on investment in terms of money they said that online education is much cheaper and feasible. If a student wants to go back, clear doubts and re-learn, online education is favorable. Also, if a student has his own speed of learning and wants study to be self-paced, then online education is a great complimentary option and more suitable as well. However, when it comes to return on investment, the student said that the networking aspect is very important as well. With traditional education, there is a greater chance to create contacts which are more meaningful, whereas in online education, the opportunities to create more meaningful contacts are lower. The knowledge gained through online education is on the good side, however, it lacks on the other aspects. When asked to rate the two modes of learning, the students said that they would give online education a rating somewhere in between six and seven. However, they would rate the traditional system an average rating of eight.

Discussions

We see that students have a preference for traditional courses despite online courses being cheaper and easier to access as they might help the students in the long run to develop their careers. The Coronavirus pandemic has increased the importance of online learning and put it in a spotlight, however, it should not be considered a solution in times of the pandemic alone, but also a supplement for traditional education [11]. At the same time, during the period of the pandemic, when the traditional education isn't possible anymore for the foreseeable future, students have shifted to online education especially the MOOCs present on platforms like Coursera, Udemy, edX etc. This was a great way for these students to gain knowledge and skills to upgrade and reskill themselves. We analyzed the factors affecting their commitment to a particular course. The courses that the students preferred should be of particular interest. This interest will help students explore areas in which they are interested. The students will not only be more attuned and motivated to complete these courses, they will also be able to know upon further research and study whether this field is suitable for them to develop a career and build upon. All these learning will help the students keep preparing and getting industry ready despite a setback in the times of the pandemic. This pandemic period has provided students with an alternative to utilize their time in an effective way to improve their skillset. They see online courses as an engaging source to follow interests. The duration of the course does not matter and affect the

selection and completion of the course. The courses preferred by the students are of high ratings and from reputable sources. The performance of the student can be predicted based upon the responses of a student and analyzing the performance and keeping track of it can help the student on continuing the course rather than abandoning it [12]. A predictive model can be developed using Recurrent Neural Network which can make prediction in the first few weeks to find the students at the highest risk of dropping out [13].

However, when it comes to face to face interactions and peer learning, the courses do not seem to satisfy the students' needs. Team work and interactions which are face to face are not replaceable in education [10]. They do not feel that such courses can replace long term traditional courses for career growth and development. There has been considerable debate as to which mode of learning is more rigorous and which is easier to complete [2]. It is such a difficult task to go online find relevant courses with a variety of them present at these platforms and YouTube as well, but some of the criteria of selection has helped these students to choose these courses and go on to complete them. Even corporations like Tata Steel have come up with 27 training programs for 1Rs in the lockdown period [14].

The MOOC evaluations are subject to bias, which could be reduced using pre-MOOC measures for comparison or by controlling for confounding variables [15]. Online courses can help students gain clarity over a topic but when it comes continuity or desire to learn over a long period of time, traditional courses are much more useful. These offline courses set a tone and schedule for learning which makes it more voluntary for the student to go on for a long duration and complete the courses. Students who are disciplined to set schedule for themselves and follow them on a regular basis and also who are slow learners or need more clarity on a topic which is much better explained are compatible with online learning. Online learning provides learning opportunities for self- paced learning with a lot of pause, rewind and research. Institutions should address flexibility, and try to limit obstacles to provide seamless learning experience [2]. Such type of study will help to delve into much deeper waters and gain an intricate understanding. Courses should try to avoid long duration lectures and written material to keep the attention of students effectively for adapting to the new learning mode [11]. Institutes should develop online education services and libraries of resources should be enhanced [16]. Students who are more comfortable with online learning perform better in the course [3].

But this is not always the case. In the time of adversity where exams were cancelled or postponed, students had a lot of free time. In these times, online courses became more and more popular and students started to taken then with a structure provided by these platforms only. Most of the students took courses in large quantities like 3-4 and above. Since the students had a lot of time to pursue these courses, the students took courses in large amounts. But when we look at the completion rate of these courses, most students were able to complete only two courses. This puts the completion rate at just 50 percent for most of the students. There is a trend that most of the students are not able to complete the courses they are taking up. This could be due

to various factors, one of them is lack of engagement among students. The students don't have something to look upon and do not have the liberty to ask questions directly to faculty and engage in more of a human connection which validates the learning of the students. This mentorship role is not available in online courses as teachers are not able to connect and guide students according to their personal needs and interests. The retention of students in the online course mainly depends on their interest and motivation and most students leave within the first few weeks of commencement. Other factors such as lack of time, feelings of isolation, insufficient backgrounds are also responsible for attrition among online students in MOOCs [17]. MOOCs should include analytics, gamification and tools for automatic translation to improve these scenarios [18]. It is important for the students to stay in the courses and grow themselves for the future and also select the courses after proper research and study which will complement their passion and interests. Online education should make use of the pandemic situation and also provide mental health related services to meet the needs which are changing with the pandemic as well [19].

Conclusion and Recommendations

We can conclude that in the age of digital transformation and advancement, teaching methodology has improved and become more accessible to the students to follow a wide range skills and knowledge areas. This has enabled students to go on see online course as an alternative. In these times of coronavirus pandemic students have a great opportunity to look at courses and explore those which are of their interests and try out new things. This will enable students to look at other career alternatives and see what suits them more. The students can take this opportunity and use it to the fullest. To avoid the feeling of lack of communication students can discuss their learning with the friend group they have and also the students taking the similar courses online from the same platform.

Various activities are to be done to utilize online education platform for optimum use [10]. The process of learning through the use of MOOCs is lacking the feature of team and group work which is vital to the learning environment [6]. There is a lack of face to face interaction among student who are doing such courses. So it is important for course makers to look at this as an opportunity to improve the engagement of students and better involve the students from the very beginning.

The platforms should not set out the goal to the student directly but also take in inputs from students so that they can customize their learning schedule. Also something needs to be addressed with the motivation level of the student. While the motivation levels of a student can change with time and situations but these platforms should come up with an idea to harness the motivation levels of the student which was present at the beginning of the course. Also the description of the courses need to be better addressed by the makers so that the student exactly knows what all is expected out of him and at what intervals of time. Current descriptions are about 1-2 minutes which do not do the justice to the details and the interest levels of the students who want to do the course. If a student finds the course not in line with interests

and expectations that he had in the beginning, then the student is also looking to leave the course leading to lesser retention of the course.

Also some of the students took more than 6 courses and also 5 courses. These students were largely unable to complete the courses and lost interest in them. So it will be recommended to the take lesser number of courses as lesser number of courses are correlated with higher completion rate of the courses. The students can put in more effort in selection of the courses with more thoughtfulness so as to gain knowledge in more efficient way so that they can take the learning of these courses for a very long time into their careers.

The course makers need to update the technology even more so that the students feel more of a classroom experience in their learning process. Since the students still prefer the traditional education as a way to network and get jobs, this issue needs to be addressed by the platforms of online education. They need to have more virtual get-togethers and bi-monthly or weekly meetings. This will keep the students engaged and let the fellow course takers become friendlier. This will improve social interaction and engagement on common areas of interest to influence each other to get the best possible outcome for all. Emphasis on collaborative problem solving can be provided for more participation and communication in groups [20]. Also these courses need to get more industry exposure so as to get job opportunities for students, especially in the time of the pandemic. Some of the engaging practices that these platforms follow are mobile apps but these do not let students communicate. A chat and information sharing group can be created and experimented for. Also the courses can be more personalized with the way courses progress and students provide more and more data relating to their approach towards the course.

Also as part of the assignment students should be allowed to take part in courses with a group activity or assignment. The formation of the group should be based on the serious intent the student has displayed till then, based on performance and engagement parameters like assignment completion and other activities. Also there should be an option changing of group partners based on reasonable factors like unavailability of the other partner which should be validated by the data which is being stored. These suggestions should a part of A/B testing so that more information can be gathered before making them part of a full-fledged functionality. Responsibility should be taken up by educational institutes to work in collaboration with these platforms to provide the best experience possible to students keeping all aspects of learning and development in mind. Some of the courses should be mandated by the educational institutes and proper discussion should be held on the learning by the students to keep them engaged as they belong to the same institution. With collaboration with these platforms the institutes can enhance the depth of knowledge among students and faculty should be available to clear the doubts and problems of the students encountered while learning through the online during the pandemic period.

These learning changes are now a necessity in the times like these but mixing those for a short period and analysing the results will be a win-win situation for both the modes of education.

The continuous inputs provided by the students will help evolve the education system so that none of them become irrelevant.

The students have the onus on themselves to select the courses in a better way and not stay idle despite education time being at a halt. The learning curve should never stop and students should explore unchartered territory which they had not imagined for themselves earlier. With all this comes a lot of screen time and lack of real connection and communication. There is a need to connect through virtual video calls and inform each other about the progress that they are making in their courses to ensure more face-face interactions. For networking students should have more meaningful conversation online with fellow course takers to build strong and robust networks and share ideas. Also some emphasis should be given on taking care of health, hygiene and staying safe.

Limitations

The data collected for the students was largely of the students who had taken both traditional and online courses. However, most of the students here have not just done online education and therefore do not see the online education as a great career opportunity. They might not have tried to create connections with the same urgency as they have got career opportunity from traditional education system. There can be a cross sectional study of the same students even after the pandemic is over the effectiveness of online courses [7]. Students who invested a great amount of their money on traditional education are less likely to rate online education as more favourable overall. This is the bias some respondents might have i.e. they have affirmation bias. They are looking to validate their decisions of what they have taken and might respond in favour of the decision that they have taken in their learning mode. Also getting first hand data from the online platforms would have given us much better insights of what the platforms are observing in terms of students and their patterns. Overall impact in a career of student might need tracking careers of students who have taken only online education and comparing it with the students who have taken only traditional education. The career path till the end is not available for students who have just done online education as online education in forms of MOOCs have become popular in the last decade.

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