NAHEP

2020

Taking A Giant Leap

Pantnagar Towards Adoption of Digital Teaching-Learning

A Study of Online Teaching-Learning Experiences of Faculty Members and Students

G. B. Pant University of Agriculture and Technology
Pantnagar 263145, Uttarakhand

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Institutional Development Plan
National Agricultural Higher Education Project
G. B. Pant University of Agriculture and Technology
Pantnagar 263145, Uttarakhand, India

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FOREWORD

The sixty years old Agricultural University entered into the online teaching-learning options for the first time during this COVID-19 pandemic. The G. B. Pant University of Agriculture and Technology, Pantnagar is the first agricultural university of the country with more than 400 faculty members and 4000 students spread across seven colleges. The University decided to get to online platforms to continue the teaching-learning process during the Corona lockdown. Being a residential University with all the students, teachers and other staff members in a closed campus, the online teaching-learning options were not experimented on University level anytime, especially due to the heavy thrust on practical classes, field works and exposures. Though the drastic shift from all-time classroom teaching to online platforms was a jerk for the faculty members and the students, yet the University adjusted for it very quickly and all the faculty members swiftly got engaged into online mode of teaching. IDP-NAHEP, Pantnagar team took the marathon initiative in training and facilitating all the faculty members in use of online teaching platforms on war footing in group as well as in one to one mode. They worked as Task Force of Emergency and emerged victorious in their mission.

This study is aimed to capture the learnings of this period to carry it ahead in future planning of the University. The online teaching-learning will continue and it needs to be carried ahead in all respects in future. The study is very comprehensive, important and timely. The outcomes need to be discussed to observe the inferences and generate a future plan for the University with implementation strategy. The time is knocking for change in outlook and I end with the words of Alvin Toffler, "The illiterate of the 21st century will not be those who cannot read and write, but those who cannot **learn**, **unlearn, and relearn**."

(Tej Partap)
Vice-Chancellor

PREFACE

The IDP-NAHEP project has made tremendous efforts in bringing the positive shift in the outlook of the students to generate much-needed higher order cognitive skills among them. The efforts and events brought a significant transformation among the University students which was reflected through their very assimilative and enterprising attitude and endeavour during COVID-19. The students shifted quite swiftly to online platforms for teaching-learning and used the tools very effectively and precisely to interact with teachers and to generate in-depth learning. During this study also, which was taken with 325 students and 61 teachers of the University, the precise and positive reflections revealed the willingness to harness the advantages of this new platform. It is overwhelming to observe that 94 percent of the students under study revealed their interest to continue with online platforms after COVID-19 in future. Also, 63 percent students expressed high level of satisfaction for the online teaching so far. Majority of users among students were very appreciative towards flexibility of timing, space, technology, interaction, AV aids support and other factors embedded in the online teaching-learning platform. Similarly, out of the total, 93.4 percent faculty members found the online platform as supportive in handling the content. Further responses of the faculty members suggested that the online platform provided liberty of scheduling the class timing, opportunity to collaborate with other colleagues and learners easily, both on and outside of the campus and emerge as better professionals with strong networking.

Looking into the situation, the demand of the future and the responses, the University has to strategize to go for online mode in post-COVID arena.

S. K. Kashyap.

(S. K. Kashyap)

Dean Agriculture

PI, IDP-NAHEP

G. B. Pant University of Agriculture and Technology, Pantnagar Adopting Online Teaching-Learning in 2020

Opportunities and Challenges

Online teaching-learning is a new experience for most of the faculty members and students of G.B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand. As of now, the University is neither running any online degree or diploma programme nor any blended programme where the students may get a chance to be partially in online mode and partially in face-to-face mode. Though the University runs 16 undergraduate degree programmes, 66 masters' programmes and 53 doctoral programmes through eight colleges, but all the programmes are being managed through traditional approach of teaching, through regular classes in face-to-face mode.

At the announcement of India's 2020-21 Union Budget, Finance Minister Nirmala Sitharaman earmarked the pathway of Indian education system for the forthcoming decade, aligning it with jobs and life-skills, "*By 2030, India is set to have the largest working-age population in the world. Not only do they need literacy, they need both job and life skills*." According to the Ministry of Human Resource Development data of September 2019, the enrollment in higher education institutes across the country reached to 37.4 million students which is 800,000 more than the previous year in absolute terms. Presently, the gross enrollment ratio has increased from 25.8 in 2017-18 to 26.3 in 2018-19. Gross enrollment ratio or GER refers to the percentage of students enrolled in higher education of the total eligible population in the 18-23 age group. The government has stated it at various forums to enhance the figure to reach upto 50 percent by 2035, i.e., doubling the admissions in the higher education institutes across the country from the current count of 37.4 million. G. B. Pant University of Agriculture and Technology, Pantnagar, Uttarakhand admits about 1800 undergraduate, 1300 masters and 600 doctoral students each year which will become about 3600 undergraduate, 2600 masters and 1200 doctoral students in the campus in one spell if the count is doubled. Is it possible for the University to sustain such a number of students in present scenario? Yes, it is and no, it is not. It is possible only if the University explores the ways towards online courses, a way less travelled for the University in last sixty years. It is not possible otherwise, in near

future, if the University aspires to double its infrastructure including classrooms, laboratories, hostel facilities and human resource.

It is not the case of Pantnagar University only. The public sector universities, by and large, are confronting with lack of budget for infrastructure strengthening. Pantnagar has lived sixty years of ambitious and fruitful life but at this juncture, the University struggles to sustain its infrastructure, lab facilities, hostels and the campus. The budget is just enough to pay-off the salaries of the employees and to look after the minimum activities with utmost sobriety. Though the count of faculty members in the campus is almost 450, but the labs, classrooms and hostels may not accommodate four thousand more students if planned to be double the strength to match the country's expectation.

The one proposition to meet out the national aspiration is to move towards online courses in robust manner, maintaining the quality of teaching-learning through updated intervention of educational and information technology resources alongwith aligning pedagogy and course materials to nurture best-quality students according to the global norms. We need to build the faculty capacity to run and manage online programs, and this is what the COVID-19 pandemic has earmarked for the Pantnagar scenario as well.

Further, the significant role of online teaching-learning in enhancing the reach and outcomes of higher education, has also been outlined in the Draft New Education Policy 2019. This draft policy document lays strong emphasis on developing the ecosystem of online teaching-learning and urges higher education institutes to engage in designing online courses, and making online courses a formal part of the academic curriculum. Also, the draft suggests that Indian institutes may collaborate with other national and international institutes to offer multidisciplinary and multi-institutional courses on a credit basis. Additionally, these courses could run with enough flexibility in terms of subjects, choice of pursuing a single degree from different institutes, timing, cost, and other related concerns. Thus, owing to the advantages offered by online teaching-learning and if Indian institutes utilize the opportunity in a structured, planned way; India could gather immense advantage out of it. It would yield beneficial outcomes not only for Indian community, but could also provide an opportunity to students in South Asia,

Africa, Middle East, and worldwide to pursue courses in Indian institutes, which again will enhance India's global partnerships and collaborations.

G. B. Pant University of Agriculture and Technology, Pantnagar has all the inherited and in-built capacity to undertake students for online and hybrid degree programmes enrolling thousands of students from across the world to take degrees, diplomas or certification courses from this premier University in the field of agriculture and allied disciplines. This is a chance for this University to grow global through alignments with national and international universities for online degrees and also to align with faculty members of national and international repute for online teaching. The University can also rope-in a large number of international students through online courses which will support the claim of this heritage University of India to emerge as global and world-ranker in true sense. It will also help the institute to generate adequate financial resources to emerge self-sustained and robust in all perspectives.

The experiences of online teaching-learning from G. B. Pant University of Agriculture and Technology, Pantnagar

Dr. Bhushan Patwardhan, Vice Chairman of the University Grants Commission (UGC) emphasized that change of attitude towards online learning should be the foremost focus, "*For these online programs to gain academic validity, the mind-set of the society must change.*" The COVID-19 pandemic provided us a chance to explore the online options for teaching-learning. G. B. Pant University of Agriculture and Technology, Pantnagar took the decision to opt for online teaching-learning mode for all the courses of undergraduate, postgraduate and Ph.D. programmes across the colleges. Though the University was not well-prepared for this drastic shift but the faculty members and the students made utmost efforts to reach to various online modes to initiate teaching and engage fruitfully in completion of courses. Now, as it has continued for almost two months since the first nationwide lockdown was announced on March 24, 2020, the faculty members and students have almost completed their courses of the continuing semester 2019-20. Hence, this occasion became timely to formally capture the experiences and the feedback of the faculty members and students about online teaching-learning. Looking into the COVID-19 challenge and the aligning problems ahead, it is imperative to look

into the possibilities of aligning the online teaching-learning structures for the future, even after the lockdown restrictions ease, as this will certainly be the strategy of upcoming era.

Responses of students and faculty members on online teaching-learning experience

The data related to the online experiences was captured through a structured online survey cunducted in the mid of May, 2020 to peep into the mindset of the stakeholders towards online teaching-learning, the opportunities and the challenges. Out of the students and teachers of the University who were using video lecture platforms for synchronous (realtime) teaching-learning since the inception of first phase of lockdown, 325 students and 61 teachers were selected for the study. The analysis of the data is hereby presented for furthering the experiences in bringing online platforms for degrees, diplomas, blended courses, certification courses as well as other academic endeavours in favour of quality teaching-learning experience at Pantnagar post COVID-19.

Exposure to online platform

The responses of students revealed that majority (79.08 percent) were experiencing online learning platforms for the first time. Similar trend was found among the faculty members in which 75.81 percent used the online teaching platforms for the first time during the COVID-19 period. Out of the first time user faculty members, 70.5 percent expressed that the trainings organized during COVID-19 for use of online platform provided confidence whereas the rest tried various platforms on their own.

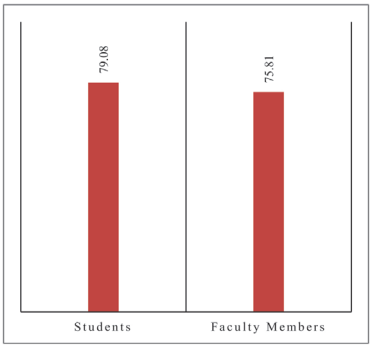

Fig. 1 Percentage of first time users of online teaching-learning platforms

Satisfaction of learning

Majority of the students (63 percent) expressed high level of satisfaction through online learning with multiple reasons like flexibility of timing, space, technology,

interaction, AV aids support and other factors. Similar reflections emerged through the responses of faculty members as well where 47.54 percent of them experienced online teaching environment as highly congenial whereas 49.18 percent expressed moderate congeniality. The factors viz. reduced students' distractions and increased focus, more opportunity to interact with students individually and recording lecture for review and follow-up were found to be contributing more than 80 per cent in generating favourable responses towards online teaching-learning experiences.

Experience regarding content sharing on online platform through powerpoint presentation, text, images, etc.

An added advantage on the online synchronous teaching platforms was content sharing through various modes. Total 64.19 percent students reflected that online platform provided ease in sharing of powerpoint presentation, text, images and other forms of content which was an added advantage for learning. Out of the rest, 20.63 percent were neutral as they did not get exposure to content sharing.

Increase in students' interaction

Students interaction is mostly in the form of asking questions or providing answers and feedback in the classroom. Total 42.69 percent students responded that their interaction significantly increased in online teaching-learning platform. Out of the total respondents, 45 percent reflected that they generated courage to participate in the interactions, reflections and questioning for the first time in their University life on the online teaching platform. Total 38.68 percent students reflected that the Hand Raise option on the online teaching platforms (Zoom platform in this case) promoted them to involve themselves in classroom interactions and providing reflections. Also, 42.71 percent students reported that the Chat Box facility (on Zoom platform in this case) substantially enhanced their involvement in classroom interactions. Out of the students, 32 percent expressed significantly enhanced efficiency and ease of learning due to online platforms.

Impact of flexibility of space, time and mode of learning in online teaching-learning

The online teaching-learning in synchronous or asynchronous mode provided

choice to teachers and students, flexibility of space, time and mode which was a different experience as compared to traditional classroom teaching which occurred in structured and packed schedule. The responses of students revealed that 61.88 percent students received this flexibility of time as a significant advantage for enhanced learning. Total 56 percent students reflected that the choice of space (location) as provided in online situation adds to the ease of learning. Further, total 61 percent students revealed that the options of keeping the audio-video on or off as per convenience, also provided learning flexibility to them which led to optimum comfort for best learning. Total 43 percent students responded that best teaching-learning could happen without much of the discipline of time and space, as is provided in case of online platform whereas 31 percent were neutral on this issue.

Students' preference for online teaching-learning

It was interesting to note that overwhelming 94 percent students opined to continue online learning mode in future out of which 62 percent expressed opinion to continue online alongwith the classroom mode (blended learning) whereas, 32 percent revealed that they will prefer fully online mode.

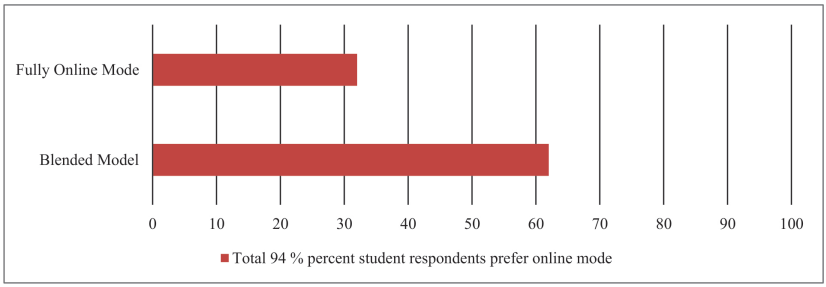

Fig. 2 Response of students regarding their preferences for continuance of online teaching-learning

Responses of faculty members on effectiveness of online teaching platform

Out of the total, 93.4 percent faculty members found the online platform as supportive in handling the content. Total 83.6 percent faculty members found the online platform effective because it provided the recording facility for further use

and review. Also, 83.6 percent faculty members expressed that each online class made them more competent in handling the functionalities of online platforms.

Responses of faculty members on tools and techniques in online teaching

Total 91.8 percent faculty members said that the online platform made the content sharing in form of powerpoint presentation, text, images etc. much easier. Only 44.26 percent faculty said that they effectively used the Chat Box and Hand Raise facility of the online platform (Zoom platform in this case).

Responses of faculty members on flexibility of time, space and mode

Total 91.16 percent faculty members responded that the liberty of scheduling the class timing was an added advantage, because earlier the class timings were mostly limited to morning 8 am till evening 5 pm slot. Out of the respondents, 73.77 percent faculty members replied that the freedom of space for the class (teaching from home or anywhere) was a brilliant experience which added to quality of teaching. Total 77.04 percent faculty expressed that the audio-video control facility also gave them more freedom to cater to best teaching practices.

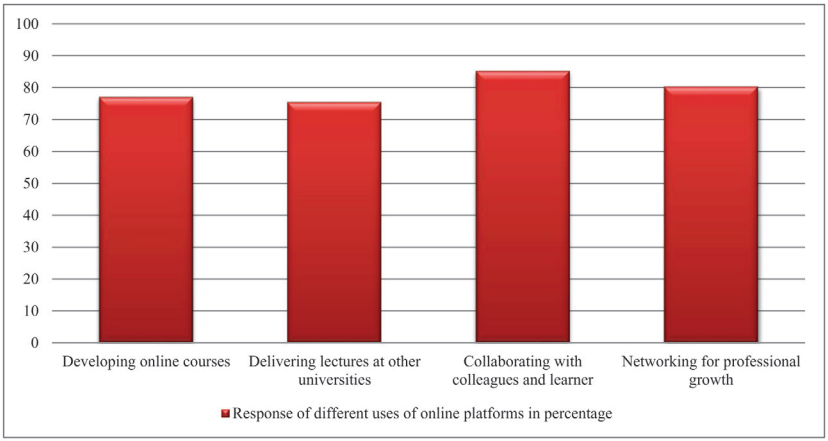

Fig. 3 Response of faculty members regarding different uses of online platforms

Future plan and strategy for online teaching

Out of the respondent faculty members, 77.04 percent expressed that they plan to use this experience for participating and developing their courses for online platforms like MOOC, SWAYAM etc. whereas 68.85 percent faculty members expressed that they want to continue the online teaching practice in the current times and in future as and when required, and 75.4 percent said that they want to continue this for online interactions with other experts, professionals and to deliver lectures for other Universities as well. Total 85.24 percent faculty members told that these online platforms will help them to collaborate with other colleagues and learners easily, both on and outside of the campus whereas 80.32 percent faculty members expressed that the online teaching platforms will improve them emerge as a better professional with strong networking.

The path ahead

Looking into the responses of students and faculty members, it is clear that the online teaching experience has been accepted and realized by both the stakeholders very positively. There has been significant improvement in the technical skill and confidence in use of online teaching platforms, as felt by the faculty members and students. The faculty and students realized the strength and effectiveness of online teaching-learning and reflected on its additional virtues in a precise manner in their feedback. The usage and utility of these platforms beyond classroom teaching was also realized very effectively by the faculty members and students which made the efforts get towards futuristic strategies for comprehensive growth and development.

The broad framework emerging out of the experience, which may align with the regular teaching-learning process of the University according to the reflections and feedback of faculty members and students is given below.

The ABCDE framework suggests that five factors play a significant role in generating effective teaching-learning outcomes through an online mode of teaching learning. The five factors i.e. autonomy to choose, behavioural liberty, conditioning stimulus, dual feedback, and engaging learners together contribute towards making the online mode of teaching-learning a successful one. In context of first time users of online teaching-learning platforms, it is essential to have a conditioning

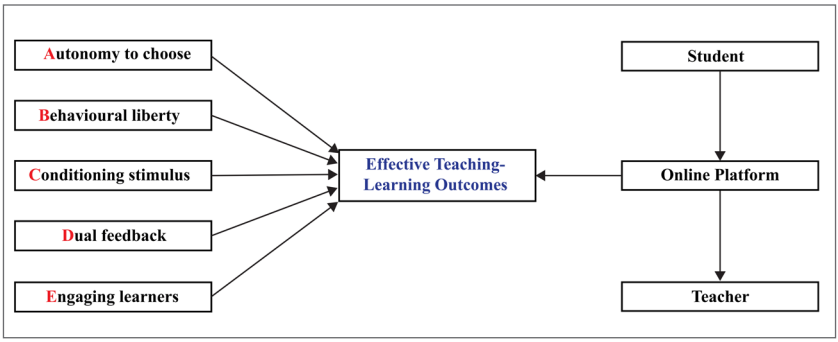

Fig. 4 The ABCDE Framework for effective adoption of online teaching-learning

stimulus. Since, most academic institutes in India undertake teaching in physical classrooms, hence shifting towards online mode would be a drastic change. Now, change in the initial phase is always resisted, and if this change of moving towards online platform was to be implemented under normal circumstances in the Indian academic institutes, it would have surely met immense resistance. However, COVID-19 provided a conditioned stimulus to academic institutes of the country to move towards the online platforms in order to continue with the teaching part of various degree programmes. Further, the extent to which this conditioned stimulus was managed, helped in mitigating the resistance from students and faculty members. For instance, faculty members of Pantnagar University were given various trainings to understand the functioning and usage of online teaching-learning platforms. Also, faculty members and students were regularly communicated about this change through the higher authorities including the vice-chancellor, and deans of different colleges, while later faculty members personally forwarded this communication their students. This entire series of training and communication inculcated an acceptance towards the online mode of teaching-learning, and motivated both faculty members and students to pursue it in the best possible manner. Apart from the conditioning stimulus and its proper utilization, the other factors of the ABCDE framework are equally important which arise from the specific tenets of online platform itself. Firstly, the autonomy to choose the space and timing for conducting a class is generally appreciated by both the students and the faculty members. The fixed time constraints that are associated with the

regular, traditional classroom teaching are no more a concern in the online mode. The class timings are decided mutually by the students and the faculty members as per their convenience, and same goes for the space aspect as well. Sitting at your home, or office or whichever place, the class can be attended or taken merely on an electronic device with suitable internet bandwidth. Further, this flexibility of time and space when clubbed with the audio-video functionality of online platform, results in behavioural liberty. There is a certain sense of relaxation and individuals are not bound to abide with the formal conduct of public appearance, which may contribute towards greater focus on learning. Also, as and when required, the faculty member can ask students to put on their audio and video to maintain classroom discipline and continual presence of students. Thus, the autonomy to choose and behavioural liberty factors together induce a self-controlled push towards acceptance and usage of online teaching-learning platforms. Now, what leads to enhanced motivation to learn and motivation to teach are the other two factors, i.e. dual feedback and engaging learners. Several functionalities of online platforms such as recording the classroom session, chat box, raise hand, conducting polls, anonymous question-answer, etc. support the above two factors. As indicated by many faculty members of Pantnagar, the recording functionality actually helped them to analyze their teaching skills and interpersonal skills in context of managing the online classroom dynamics. Now, this kind of feedback which faculty members generated themselves by going through the video recordings would not have been otherwise possible. In case of online platforms, the recording is immediately available after the online session ends, and is available personally to the concerned faculty member. Now, this immediacy and privacy is difficult to generate in case of traditional, physical classroom infrastructure. Though with emerging technologies, it might be possible in times to come. Moreover, in case of students, they can freely put up their queries, opinions, arguments without much concerns of peer pressure or classroom anxiety or fear of judgement. This also provides them a chance to interact with their instructor (faculty member) without much hassles of physical presence or confrontational challenges. It was found out in case of Pantnagar students, that almost 44 percent of students were such who participated in class discussion or raised their doubts for the first time in their entre degree programme. Thus, this dual feedback mechanism increases the motivation to learn for students

and motivation to teach better in case of faculty members. Finally, the engaging learners factor emerges strongly from the functionality of content sharing. Through various possibilities of content sharing in the form of audio, video, images, documents, interactive presentations, polling, etc., different types of learners can be strategically engaged in the learning process. Since, students owe a high degree of learning independence in case of online mode, thus it is suggested that if content sharing is done in different modes, it will improve the attention span of the learners as they shall be actively engaged for a longer time. This way learner-centricity of the online class would also be ensured and hence learning outcome will also be better. Overall, the ABCDE framework recommends a pathway to introduce and sustain online teaching-learning in an effective way. Nevertheless, online mode has its own pros and cons, but as per the demand of current circumstances and the future requirements, it is essential to work on the strengths of online modes of teaching-learning. This study and the suggested framework is an attempt in the same direction, such that the experiences of online teaching-learning are enhanced for students and faculty members of Pantnagar University as well as for the rest of the academic fraternity of India and worldwide.

Annexure 1: List of Respondent Faculty Members

List of Faculty Members			
S. No.	**Name**	**Department**	**College**
1.	Dr. A. K. Gaur	Molecular Biology and Genetic Engineering	Basic Sciences and Humanities
2.	Dr. A. K. Singh	Horticulture	Agriculture
3.	Dr. A. K. Tewari	Plant Pathology	Agriculture
4.	Dr. A. S. Jeena	Genetics and Plant Breeding	Agriculture
5.	Dr. Ajay Veer Singh	Microbiology	Basic Sciences and Humanities
6.	Dr. Alka Goel	Clothing and Textiles	Home Science
7.	Dr. Alka Verma	Vegetable Science	Agriculture
8.	Dr. Aman Kamboj	Veterinary Physiology and Biochemistry	Veterinary and Animal Sciences
9.	Dr. Amit Bhatnagar	Agronomy	Agriculture
10.	Dr. Amit Kesarwani	Agronomy	Agriculture
11.	Dr. Anju Pal	Horticulture	Agriculture
12.	Dr. Anupama Pandey	Home Science Extension	Home Science
13.	Dr. Arpita Sharma	Agricultural Communication	Agriculture
14.	Dr. Atul Kumar	Plant Physiology	Basic Sciences and Humanities
15.	Dr. Bijendra Kumar	Plant Pathology	Agriculture
16.	Dr. Deepshikha	Plant Pathology	Agriculture
17.	Dr. Dhirendra Singh	Vegetable Science	Agriculture
18.	Dr. Dinesh Pandey	Molecular Biology and Genetic Engineering	Basic Sciences and Humanities
19.	Dr. Divya singh	Family Resource Management	Home Science
20.	Dr. Gagan Dixit	Physics	Basic Sciences and Humanities
21.	Dr. Geeta Sharma	Plant Pathology	Agriculture
22.	Dr. Gurdeep Bains	Plant Physiology	Basic Sciences and Humanities

23.	Dr. J. P. Jaiswal	Genetics and Plant Breeding	Agriculture
24.	Dr. K. P. S. Kushwaha	Plant Pathology	Agriculture
25.	Dr. K. P. Singh	Plant Pathology	Agriculture
26.	Dr. Kiran Rana	Agricultural Communication	Agriculture
27.	Dr. Lal Bahadur Yadav	Plant Pathology	Agriculture
28.	Dr. M. Raghav	Vegetable Science	Agriculture
29.	Dr. M. L. Kushwaha	Vegetable Science	Agriculture
30.	Dr. Manisha Rani	Soil Science	Agriculture
31.	Dr. Manju Sharma	Plant Pathology	Agriculture
32.	Dr. Neelam Bhardwaj	Agricultural Communication	Agriculture
33.	Dr. Neetu Dobhal	Foods and Nutrition	Home Science
34.	Dr. Omveer Singh	Horticulture	Agriculture
35.	Dr. Pooja Tamta	Home Science Extension	Home Science
36.	Dr. Preeti Chaturvedi	Biological Sciences	Basic Sciences and Humanities
37.	Dr. Priyanka Pandey	Molecular Biology and Genetic Engineering	Basic Sciences and Humanities
38.	Dr. Pushpa Lohani	Molecular Biology and Genetic Engineering	Basic Sciences and Humanities
39.	Dr. Ragini Mishra	Human Development and Family Studies	Home Science
40.	Dr. Rajeew Kumar	Agronomy	Agriculture
41.	Dr. Ranjan Srivastava	Horticulture	Agriculture
42.	Dr. Roopali Sharma	Plant Pathology	Agriculture
43.	Dr. Ruchi Gangwar	Agricultural Economics	Agriculture
44.	Dr. S. K. Guru	Plant Physiology	Basic Sciences and Humanities
45.	Dr. S. K. Maurya	Vegetable Science	Agriculture
46.	Dr. S. K. Mishra	Plant Pathology	Agriculture
47.	Dr. Sakshi	Clothing and Textiles	Home Science
48.	Dr. Salil Tewari	Genetics and Plant Breeding	Agriculture
49.	Dr. Sandhya	Family Resource Management	Home Science

50.	Dr. Sanjeev Agrawal	Biochemistry	Basic Sciences and Humanities
51.	Dr. Shailbala Sharma	Plant Pathology	Agriculture
52.	Dr. Shefali Massey	Clothing and Textiles	Home Science
53.	Dr. Shilpi Rawat	Plant Pathology	Agriculture
54.	Dr. Shweta Chaudhary	Agricultural Economics	Agriculture
55.	Dr. Sneh Gautam	Molecular Biology and Genetic Engineering	Basic Sciences and Humanities
56.	Dr. Sobaran Singh	Soil Science	Agriculture
57.	Dr. Sonu Rani	Clothing and Textiles	Home Science
58.	Dr. Vandana A. Kumar	Biochemistry	Basic Sciences and Humanities
59.	Dr. Veer Singh	Soil Science	Agriculture
60.	Dr. Vinod Kumar	Mathematics, Statistics and Computer Science	Basic Sciences and Humanities
61.	Dr. Vir Singh	Environmental Science	Basic Sciences and Humanities

Annexure 2: List of Respondent Students

List of Students			
S. No.	**Name**	**Id. No.**	**College**
1.	Aakash	53561	Technology
2.	Aarti Singh	54505	Agriculture
3.	Aastika Pandey	52945	Agriculture
4.	Abha Belwal	53017	Agriculture
5.	Abhijeet Kumar	49964	Agriculture
6.	Abhijeet Rai	53284	Agriculture
7.	Abhishek Samrat	53199	Home Science
8.	Abhishek Singh Kandari	49885	Agriculture
9.	Abhishek Vardhan	51430	Agriculture
10.	Abhyudaya	53087	Agriculture
11.	Aditi	50143	Agriculture
12.	Aditi Gangola	51610	Home Science
13.	Aditi Kaloni	53195	Home Science
14.	Aditi Pandey	54366	Agriculture
15.	Aishwarya Shah	51470	Agriculture
16.	Ajay Pangtey	51433	Agriculture
17.	Akanksha Joshi	53250	Agriculture
18.	Akanksha Singh	54495	Agriculture
19.	Akansha Lohani	53205	Home Science
20.	Akansha Nayak	50044	Agriculture
21.	Akansha Upadhyay	54635	Agriculture
22.	Akhil Ruhela	54515	Agriculture
23.	Akhilesh Kumar	49948	Agriculture
24.	Akhilesh Singh	54462	Agriculture
25.	Akshay Hatwal	53325	Basic Sciences and Humanities
26.	Akshita Goswami	53212	Home Science
27.	Akshita Kushwaha	49872	Agriculture
28.	Akshita Rawat	54506	Agriculture

29.	Ambika Malla	54369	Agriculture
30.	Aniket Verma	53209	Home Science
31.	Anita Negi	54394	Agriculture
32.	Anjali	53192	Home Science
33.	Anjali Bisht	54637	Agriculture
34.	Anjali Mehta	52965	Agriculture
35.	Anjali Rawat	49970	Agriculture
36.	Anjali Sharma	53210	Home Science
37.	Anju	49913	Agriculture
38.	Ankita Tewari	51443	Agriculture
39.	Anoop Kumar	54483	Agriculture
40.	Anshika Singh	51568	Home Science
41.	Anu Deorari	54392	Agriculture
42.	Anubhav Rana	54710	Basic Sciences and Humanities
43.	Anuj Banola	49860	Agriculture
44.	Anureet Kaur Sandhu	53042	Agriculture
45.	Arfaz Ahmed	51389	Agriculture
46.	Arpit Jain	54442	Agriculture
47.	Arpit Kumar	54401	Agriculture
48.	Ashmita Chauhan	49947	Agriculture
49.	Avinash	53220	Home Science
50.	Akhouri Ayush	49927	Agriculture
51.	Ayushi Joshi	51598	Agriculture
52.	Ayushi Mamgain	54351	Agriculture
53.	Ayushi Mehra	51680	Agriculture
54.	Ayushi Singhal	54436	Agriculture
55.	Bhavna Negi	54681	Agriculture
56.	Bhawana Murari	53170	Home Science
57.	Bhoomi Sonkar	54518	Agriculture
58.	Bhumit Sah	51484	Agriculture
59.	Chandra Shekhar	53291	Agriculture
60.	Chetan Joshi	52996	Agriculture

61.	Chetan Tiwari	54708	Basic Sciences and Humanities
62.	Chhavi Bisht	51374	Agriculture
63.	Chitra Joshi	54361	Agriculture
64.	Chitranshi Yadav	51407	Agriculture
65.	Deeksha Fartyal	51604	Home Science
66.	Deepak Singh Chauhan	51709	Agriculture
67.	Deepali Arya	52984	Agriculture
68.	Deepika Karnatak	50130	Agriculture
69.	Deepshikha Kothari	51616	Home Science
70.	Deepti Joshi	49880	Agriculture
71.	Devanshu Kumar	53053	Agriculture
72.	Dikesh Singh Chilwal	51382	Agriculture
73.	Diksha Mathpal	54410	Agriculture
74.	Diksha Pal	54375	Agriculture
75.	Diksha Srivastava	53235	Home Science
76.	Disha Arora	53298	Agriculture
77.	Dishita	53088	Agriculture
78.	Divya Raj	53083	Agriculture
79.	Ekta	49961	Agriculture
80.	Ganga Datt Kandpal	51290	Veterinary and Animal Sciences
81.	Garima Dwivedi	54582	Home Science
82.	Gaurav Mattoo	54492	Agriculture
83.	Gaurav Tiwari	53190	Home Science
84.	Gauri Bisht	54406	Agriculture
85.	Gyaneshwari Agarwal	51602	Home Science
86.	Harsha Saxena	51734	Basic Sciences and Humanities
87.	Harshit Chandra	49883	Agriculture
88.	Harshita Rana	53019	Agriculture
89.	Harshita Verma	54644	Agriculture
90.	Hema Mehra	54358	Agriculture
91.	Himani	48327	Agriculture
92.	Himani Belwal	51562	Home Science

93.	Himanshu Bhakuni	53015	Agriculture
94.	Huidrom Lakshmi Devi	49956	Agriculture
95.	Janvi Kochar	51627	Home Science
96.	Jatin Yogi	53105	Agriculture
97.	Jayamani	51603	Home Science
98.	Jigyasa Nayak	55098	Technology
99.	Jiun Singh Kahlon	53283	Agriculture
100.	Jujhar Singh	53289	Agriculture
101.	Jyoti Arya	50089	Home Science
102.	Jyoti Pandey	53218	Home Science
103.	Kajal Mehra	51509	Agriculture
104.	Kanchan Bisht	51581	Home Science
105.	Kanchan Taragi	54396	Agriculture
106.	Kanika Kapkoti	54417	Agriculture
107.	Karishma Joshi	51466	Agriculture
108.	Kavita Bhatt	54502	Agriculture
109.	Kavitanjali	51592	Home Science
110.	Kavya Chandra	49969	Agriculture
111.	Kavya Joshi	51583	Home Science
112.	Keena Singh Rathour	51738	Basic Sciences and Humanities
113.	Keshav Bhatt	54428	Agriculture
114.	Khaba Moirangthem	51418	Agriculture
115.	Kritika Chand	52956	Agriculture
116.	Kritika Chouhan	49894	Agriculture
117.	Kumari Renu	54514	Agriculture
118.	Kusum	51457	Agriculture
119.	Lata Panoura	52951	Agriculture
120.	Lokendra Singh	49887	Agriculture
121.	Lokesh Singh	54482	Agriculture
122.	Mahendra	53078	Agriculture
123.	Mallika Tripathi	54412	Agriculture
124.	Manish Mehra	53034	Agriculture

125.	Manisha	53194	Home Science
126.	Manisha Bora	52982	Agriculture
127.	Mansi	53208	Home Science
128.	Mansi Badhani	53153	Home Science
129.	Mansi Bisht	53069	Agriculture
130.	Mansi Napalchyal	53207	Home Science
131.	Mansi Pant	52969	Agriculture
132.	Mansi Saklani	53296	Agriculture
133.	Medhavi Sati	51597	Home Science
134.	Meenakshi Rawat	51712	Agriculture
135.	Meghna Sarkar	54451	Agriculture
136.	Mehak Agrawal	53191	Home Science
137.	Mohit	51451	Agriculture
138.	Mohit Arya	51445	Agriculture
139.	Mohit Bhakuni	53009	Agriculture
140.	Mohit Chand	54633	Agriculture
141.	Mohit Singh Bohra	53038	Agriculture
142.	Monika Bisht	54618	Agriculture
143.	Mrinal Arya	51429	Agriculture
144.	Mudit Joshi	49908	Agriculture
145.	Mufaiz Malik	51390	Agriculture
146.	Mukul Giri Goswami	54372	Agriculture
147.	Mukul Singh Parihar	54414	Agriculture
148.	Muskan Tomar	51611	Home Science
149.	Narendra Singh	51420	Agriculture
150.	Naveen Chandra	52869	Veterinary and Animal Sciences
151.	Neeraj Papnai	49853	Agriculture
152.	Neeraj Tiwari	52954	Agriculture
153.	Neha	49912	Agriculture
154.	Neha Juyal	50055	Agriculture
155.	Neha Kapoor	54716	Basic Sciences and Humanities
156.	Nidhi Bhagat	54422	Agriculture

157.	Niharika Rawat	51661	Agriculture
158.	Nikhil Gupta	51493	Agriculture
159.	Nikhil Kumar	50198	Basic Sciences and Humanities
160.	Nikhil Rawat	51370	Agriculture
161.	Nikita Dey	53079	Agriculture
162.	Nimisha Maurya	51395	Agriculture
163.	Nirmal Pandey	51361	Agriculture
164.	Nisha	51577	Home Science
165.	Nitesh Kumar Adhikari	54443	Agriculture
166.	Nitin	54491	Agriculture
167.	Nitin Patni	51386	Agriculture
168.	Oshin	51471	Agriculture
169.	Palak Chaturvedi	54512	Agriculture
170.	Pallavi Bisht	52958	Agriculture
171.	Pankaj Kumar Meena	51437	Agriculture
172.	Pankaj Rana	49855	Agriculture
173.	Paritosh Kumar	54461	Agriculture
174.	Parth Gulati	49962	Agriculture
175.	Peeyush Pandey	52979	Agriculture
176.	Pooja Belwal	54464	Agriculture
177.	Pooja Chand	53300	Agriculture
178.	Pooja Kandpal	53183	Home Science
179.	Pooja Mehra	51280	Veterinary and Animal Sciences
180.	Pooja Saxena	53071	Agriculture
181.	Poonam Chausali	49846	Agriculture
182.	Poonam Kumari	53096	Agriculture
183.	Prabhat Kumar Singh	54404	Agriculture
184.	Prachi Nagarkoti	52949	Agriculture
185.	Prachi Pandey	51388	Agriculture
186.	Prachi Rawat	53073	Agriculture
187.	Prachi Vaishnava	49878	Agriculture
188.	Pradeep Negi	51393	Agriculture

189.	Prajjawal Bagdwal	53010	Agriculture
190.	Prakhar	46060	Agriculture
191.	Prakhar Sharma	54636	Agriculture
192.	Pranjal Naudiyal	51486	Agriculture
193.	Pranjali Pandey	51397	Agriculture
194.	Pranshi Gupta	51667	Home Science
195.	Prashant	55446	Agriculture
196.	Prashant Bisht	51368	Agriculture
197.	Prashant Kesarwani	49843	Agriculture
198.	Prashant Rana	54465	Agriculture
199.	Pratiksha	53243	Agriculture
200.	Pratima Tewari	52820	Technology
201.	Preeti Dhanik	54421	Agriculture
202.	Princi Prasad	53177	Home Science
203.	Priya Upreti	53167	Home Science
204.	Priyanka	49857	Agriculture
205.	Priyanka Joshi	51666	Agriculture
206.	Pushkar Bora	51366	Agriculture
207.	Pushpa	54473	Agriculture
208.	Radha Koranga	43661	Agriculture
209.	Raghvendra Singh	51405	Agriculture
210.	Ragini Prasad	51621	Home Science
211.	Rahul Bohara	51675	Agriculture
212.	Rahul Kharkwal	54717	Basic Sciences and Humanities
213.	Rajat Sanwal	54711	Basic Sciences and Humanities
214.	Rakshit Malik	48364	Technology
215.	Ranjan Singh Amera	54671	Agriculture
216.	Rashi Chahal	54485	Agriculture
217.	Rashika Tamta	52987	Agriculture
218.	Rashmi Rana	51511	Agriculture
219.	Ravi Kumar Jha	54455	Agriculture
220.	Reeba Sharma	49871	Agriculture

221.	Renu Khampa	50052	Home Science
222.	Rinchen Dolker	54353	Agriculture
223.	Rishabh Joshi	53278	Agriculture
224.	Ritika Bharti	53145	Home Science
225.	Ritika Deo	53203	Home Science
226.	Ritika Saini	49945	Agriculture
227.	Riya Bisht	54426	Agriculture
228.	Riya Goswami	54377	Agriculture
229.	Rubal V. Kumar	54463	Agriculture
230.	Saba Tanveer	51432	Agriculture
231.	Sachin Rawat	54402	Agriculture
232.	Sadaf	51392	Agriculture
233.	Safal Shandilya	53266	Fisheries
234.	Sagar Bhatt	54498	Agriculture
235.	Sahil Dhayal	53077	Agriculture
236.	Sahnik Mondal	53108	Agriculture
237.	Sai Kumar Banoth	53091	Agriculture
238.	Sakshi Dimri	51459	Agriculture
239.	Saloni Kumari	54490	Agriculture
240.	Sandhya Gangwar	53201	Home Science
241.	Sandhya Rawat	52974	Agriculture
242.	Sandhya Tomar	54468	Agriculture
243.	Sara Sati	50026	Home Science
244.	Sarthak Kothiyal	51662	Agriculture
245.	Saumya Kumar	51618	Home Science
246.	Saurabh Kumar	51567	Home Science
247.	Saurabh Kumar	54438	Agriculture
248.	Saurav Rawat	51262	Veterinary and Animal Sciences
249.	Sharil Agarwal	53162	Home Science
250.	Shashank Singh Rawat	54391	Agriculture
251.	Sheetal Berry	51453	Agriculture
252.	Sheetal Negi	52957	Agriculture

253.	Sheetal Rawat	53050	Agriculture
254.	Shekhar Gautam	53029	Agriculture
255.	Shiksha Pandey	52856	Veterinary and Animal Sciences
256.	Shivam Bhatt	54712	Basic Sciences and Humanities
257.	Shivani Gusain	54612	Home Science
258.	Shivani Kashyap	54439	Agriculture
259.	Shivani Nainwal	53282	Agriculture
260.	Shiwani Selwal	53197	Home Science
261.	Shraddha Tewari	54356	Agriculture
262.	Shreshtha Chandra	51461	Agriculture
263.	Shreya Verma	49959	Agriculture
264.	Shreyansh Maurya	52962	Agriculture
265.	Shreyas Bagrecha	49889	Agriculture
266.	Shrishti Tiwari	54672	Agriculture
267.	Shriya Gururani	53977	Basic Sciences and Humanities
268.	Shruti Kashyap	51436	Agriculture
269.	Shruti Singh	54489	Agriculture
270.	Shubham Juyal	51379	Agriculture
271.	Shubham Rajput	50165	Agriculture
272.	Simran Pundir	53058	Agriculture
273.	Smriti Kamal	53022	Agriculture
274.	Smrutirekha Pati	54454	Agriculture
275.	Somlata	53187	Home Science
276.	Somya Tewari	54357	Agriculture
277.	Sonal Saklani	49830	Agriculture
278.	Sonali	50042	Home Science
279.	Sonu Joshi	54365	Agriculture
280.	Soumya Pokhariya	51678	Agriculture
281.	Srishti Sanwal	54354	Agriculture
282.	Stuti Bhoj	50082	Home Science
283.	Stuti Lavania	54413	Agriculture
284.	Suchitra	51614	Home Science

285.	Sumit Bora	53074	Agriculture
286.	Sumit Kumar	54427	Agriculture
287.	Sumit Tiwari	52963	Agriculture
288.	Sunder Tangariya	49972	Agriculture
289.	Suraj Kohli	50213	Basic Sciences and Humanities
290.	Suraj Kumar	49879	Agriculture
291.	Suraj Kumar	53417	Technology
292.	Suravi Rawat	53072	Agriculture
293.	Surbhi	51625	Home Science
294.	Sushmita	53055	Agriculture
295.	Sushmita Joshi	53206	Home Science
296.	Swarnika	51381	Agriculture
297.	Sweta Rawat	51376	Agriculture
298.	Tanuja Mehra	53156	Home Science
299.	Tanuja Paladiya	53024	Agriculture
300.	Tanushree Lohani	50022	Home Science
301.	Tarukh Ahmad Malik	49852	Agriculture
302.	Toran Singh	52999	Agriculture
303.	Ujjwala Samant	54466	Agriculture
304.	Umesh Bhagat	53060	Agriculture
305.	Unnati Joshi	54674	Agriculture
306.	Vaishali Sharma	54420	Agriculture
307.	Vanshika	52991	Agriculture
308.	Vanshika Gupta	52968	Agriculture
309.	Varnika Tripathi	54501	Agriculture
310.	Varsha Kamboj	53218	Home Science
311.	Varsha Vishwakarma	53061	Agriculture
312.	Vidyottama Rawat	53151	Home Science
313.	Vijay Kumar	53021	Agriculture
314.	Vikash Kumar	53102	Agriculture
315.	Vinay Mohan Kandpal	54715	Basic Sciences and Humanities
316.	Vinayak Suyal	54387	Agriculture

317.	Vishal Rana	54497	Agriculture
318.	Vishesh Bhatt	51394	Agriculture
319.	Vishesh Mishra	51732	Basic Sciences and Humanities
320.	Vivek Balloda	54471	Agriculture
321.	Yachana	51575	Home Science
322.	Yamini Chaudhary	49850	Agriculture
323.	Yatendra Singh Rawat	51458	Agriculture
324.	Yogesh Pandey	50192	Basic Sciences and Humanities
325.	Yuvraj Singh	51664	Agriculture

Annexure 3: Survey Questionnaire for Faculty Members

1. Name: ……
2. Age: .....
3. Teaching Experience (in years): ……
4. Department:…….....
5. You are teaching which courses ?
   - ☐ Under-Graduate
   - ☐ Post-Graduate
   - ☐ Ph.D.
6. You have access to the Internet through
   - ☐ Dial-up connection (broadband etc)
   - ☐ Leased Lines (as available in departments)
   - ☐ Wireless
   - ☐ Mobile devices
7. Which device do you use most frequently to access the Internet?
   - ☐ Smartphone
   - ☐ Tablet
   - ☐ Laptop
   - ☐ Desktop
8. Do you get Wi-Fi/wireless Internet connectivity on your campus?
   - ☐ Yes
   - ☐ No

9. I use the Internet:

   ☐ Daily

   ☐ Alternate days

   ☐ Once a week

   ☐ Irregularly

   ☐ Rarely

   ☐ Never

10. On an average, how much time do you spend on Internet-related activities (email, browsing, social media) daily?

    ☐ < 1 hour

    ☐ 1-2 hours

    ☐ 3-5 hours

    ☐ > 5 hours

    ☐ Do not use daily

11. Have you ever taught online before ? Yes or No

12. If yes, then for how long ? (in hours) .....

13. Have you come across any Online teaching app for conducting online course before COVID-19? (Yes/No)

14. In the past year, have you taken a MOOC (massive open online course) through any institution/organization?

    ☐ No, and I don't know what a MOOC is

    ☐ No, but I do know what a MOOC is

    ☐ Yes, but I could not complete.

    ☐ Yes, and I completed it

15. Before your transition from face to face platform to online, what made you to get online with confidence ?

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
I was versed and trained for online teaching from before.					
Additional technical support was provided to transition face-to-face teaching to online amidst COVID-19 pandemic which made me confident.					
Though for the first time, but I did it on my own through trial errors.					

16. Please share your teaching experiences of online teaching

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
Online teaching supported in handling the content.					
Online teaching gave more opportunity to interact with individual students.					
Online teaching reduced distractions among students and make them more focussed.					
Online teaching helped in creating document of students' interaction, feedback and involvement					
Online teaching provided better time management opportunity in class					
Online teaching gave an opportunity to record my lecture for review and follow-up					
With each online class, I felt more confident and better equipped to handle the technological issues that was a learning for me.					

17. Experiences of content sharing and other online facilities

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The content sharing in form of powerpoint, text, photos and images etc was much easy in online teaching.					
The students' involvement and replies increased substantially due to chat box and other facilty as compared to regular classroom teaching.					
The handraise options promoted students to involve themselves much more as compared to regular classroom teaching.					
The teaching became more efficient and easier due to the online teaching functions.					

18. The experiences related to flexibility of time and space

Statements	Strongly Agree	Agree	Neutral	Disagree	Strongly Disagree
The freedom of selection of time of class, right from morning to night, was an added advantage.					
The freedom of space for the class (teaching from home or anywhere) was a brilliant experience which added to quality of teaching.					
The facility of video mute and unmute also gave me more freedom to cater best teaching.					
I could feel that best teaching-learning could happen without much of the discipline of time and space.					

19. Do you want to continue with the online teaching experience after COVID 19 shutdown ?

Statements	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
I want to continue the online teaching experience for ongoing teaching from time to time.					
I want to continue this for online interactions with other experts, professionals and to deliver lectures for other Universities.					
I want to use this experience for participating and developing my courses for online platforms like MOOC, SWAYAM etc.					

20. Please rate the following statements about technology use in your respective courses.

Statements **I want to keep using this online teaching technology because……**	**Strongly Agree**	**Agree**	**Neutral**	**Disagree**	**Strongly Disagree**
It will help me get better results in my subjects.					
It will help me align with other online platforms for better learning.					
It will help me in giving assignments, projects, tests in my subjects more effectively.					
It will align me to explore many topics/courses which I had not aligned before.					
It will help me to collaborate with others easily, both on and outside of the campus.					
It will improve me emerge as a better professional with strong networking.					

Annexure 4: Survey Questionnaire for Students

1. Name: ……..

2. ID No……..

3. Age: .....

4. Gender:

   ☐ Female

   ☐ Male

5. College: ……

6. Degree Programme: ……...

7. Year of Study:

   ☐ 1st Year

   ☐ 2nd Year

   ☐ 3rd Year

   ☐ 4th Year

8. Was it a first time experience of online class or you had attended such classes before :

   a. It was a first experince for me for classroom teaching and real-time lecture.
   b. I had undertaken such classes previously also in my school days.
   c. I have done online courses previously on different subjects.

9. To what extent do you think that the process of online learning has met your expectations?

Statements	Always	Somewhat	Never
The online teaching-learning process has met my expectations.			
The online methods of course content delivery has met my expectations.			
The online course discussions has met my expectations.			
The online student-instructor interactions has met my expectations.			
The online student-student interactions has met my expectations.			

10. Suggest your level of agreeableness by answering the following questions. (SA- Strongly Agree, A-Agree, DA- Disagree, SDA- Strongly Disagree)

Statements	**SA**	**A**	**Neutral**	**DA**	**SDA**
Content and Design of Online Classes					
Online learning experience is enjoyable and interesting as compared to traditional classroom.					
Online learning allows learners to choose his/her learning style.					
Subject matter introduction is as effective as in traditional classroom learning.					
Content is clearly understood and comprehensible.					
Language understanding is simple as compared to formal classroom teaching.					
The teaching material shared in online courses covers important concepts related to course outline.					
The teaching material shared in online courses is credible and up-to-date.					
Instructor to Learner Interaction (ITI)					
There is enough opportunity to interact with the instructor to ask questions.					
There is enough opportunity to interact with the instructor as compared to traditional classroom.					
The instructor responded to my questions in a timely manner.					
I felt free to express and explain my own views throughout the learning process.					
Instructor Support (IS)					
The online system provided the instructor more freedom in managing the learning process.					
The online learning system provided the instructor more opportunity to generate the discussions.					
The online system provides enough options to the instructor for supporting student learning.					
Instructor Feedback					
The instructor provided timely feedback on my inputs.					

I felt as if the instructor cared about my individual learning in this learning process.					
The instructor was more responsive to student concerns as compared to regular teaching.					
Learner to Learner Interaction					
Student interaction was an important component of this learning process.					
I had sufficient opportunity to interact with other students on the online platform.					
Perceived Effectiveness					
I have learned a lot during online classes.					
I would recommend online platform to friends/ colleagues for effective learning.					

NOTES

NOTES

Institutional Development Plan
National Agricultural Higher Education Project
G. B. Pant University of Agriculture and Technology
Pantnagar 263145, Uttarakhand