Re-imagining Higher Agricultural Education in India on the Face of Challenges from COVID-19 Pandemic

Strategies for Adapting to the New Normal
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Message from Director General, ICAR, New Delhi

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The COVID-19 pandemic has caused significant disruption to the global education systems. The Agricultural Universities in India have responded well to the situation and have internalized many innovations towards sustaining the academic programs and student engagements during the pandemic-led lockdown across the country. The Indian Council of Agricultural Research (ICAR) has stayed in constant touch with all the Agricultural Universities and offered timely and periodic advisories for dealing with the situation.

The ICAR has always been striving to enhance the quality and relevance of agricultural education in partnership with the Agricultural Universities through various reforms and policies. It has contributed in building physical capacity and faculty competencies in various domains, which contributed in the timely and quick response of farm universities in India under this unprecedented global pandemic.

The current pandemic has paved way for many disruptive innovations in use of technology for education, which otherwise taken much longer time. The inhibitions among the faculty members on their ability to cope up with the need to stay engaged in the academic activities through various online means, have waded away. It is time that the Universities build on their experiences, capitalizing on this momentum and adapt their academic content and delivery to the New Normal.

The Academic leaders need to chart short term actions and long term strategies in this regard, leveraging the inherent strength of linkages and network among various agricultural higher education institutions in India.

I am pleased with the timely effort made by ICAR-NAARM in preparing this policy paper, wherein broad contours for future actions have been effectively captured. I appreciate Dr. P.K. Joshi, Dr. B. Venkateswarlu and Dr. A.G. Ponniah for their inputs and valuable guidance in this regard.

MESSAGE
(T. MOHAPATRA)
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Dated the 1st June, 2020
New Delhi
India is all set to reach its target of Gross Enrolment Ratio (GER) in higher education (32%) by 2022 (against the global average of 36.7%), suggesting Higher Education (HE) in India as a mass system, where HE is seen as a right for those with certain formal qualifications. Expanding GER through creating additional brick and mortar structures with state funds would only provide incremental benefits vis-a-vis the need. One of the key approaches for leapfrogging the GER is through enhancing access and managing the crunch in faculty strength by leveraging technology in education. The major barrier for infusing technology in education all through had been faculty perceptions on their use and effectiveness. The COVID crisis has aided in breaking this barrier significantly and in creating an ecosystem for wide-spread adoption of technology in education and thus providing for fast-pacing the transition through a planned strategy.

Agricultural higher education, being a major contributor to increasing GER in India, has played a distinct role in terms of internalizing use of digital technology for teaching. This Policy Paper maps the perception of university administrators, faculty members and students on the potential impacts of the crisis on agricultural higher education, which provide adequate pointers for planning for the short-term and preparing for the long-term future – in our endeavour to convert the crisis into an opportunity.

Re-imagining Higher Agricultural Education in India on the Face of Challenges from COVID-19 Pandemic

Strategies for Adapting to the New Normal

1. Agricultural Education in India: An Overview

Agricultural Education in India is strengthened and streamlined centrally by the Indian Council of Agricultural Research (ICAR) and is imparted through State Agricultural Universities (63), Deemed to be Universities (4), Central Agricultural Universities (3), Central Universities with Agriculture Faculty (4) and a few other institutions under private and public sectors. Altogether there are about 35,000 faculty members spread across these Universities who are engaged full-time in teaching, research and extension pertaining to agricultural and allied sciences, and an estimated 1.65 lakh students are pursuing various Undergraduate, Postgraduate and Doctoral programmes in these institutions (2019-20). The students of agricultural education across India predominantly hail from Karnataka, Uttar Pradesh, Maharashtra and Andhra Pradesh, while majority of the faculty members hail from Maharashtra, Gujarat and Karnataka (Fig. 1).
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2. Impact of the Pandemic on Agricultural Education in India

COVID-19, the global pandemic has caused unprecedented havoc to various sectors of economic development, and education sector is no exception. The lockdown clamped by the Union and State Governments to contain the spread and ameliorate the impacts of this pandemic, has caught the entire academic fraternity by surprise. While the Traditional Educational Institutions in India have predominantly remained closed and had suspended their activities, the State and Central Agricultural Education Institutes, including the Deemed Universities under ICAR have relatively responded proactively, not withstanding their inherent limitations, which could be attributed to the sustained efforts of the Indian Council of Agricultural Research in coordinating national exercises for building digital content in partnership with all members of the National Agricultural Research and Education System (NARES) and building the skill sets of the Faculty Members in using digital technology for teaching.

A study was designed to find out the consequences of COVID-19 during the lockdown period, response strategies adopted and lessons learnt for future. Data were collected during April, 2020 on a structured survey schedule administered as an online survey using Google Forms, targeting the students and Faculty Members spread across India. In all, 1132 students from 51 Agricultural Universities undergoing Ph.D. (14.9%), Masters (5.8%) and Undergraduate (79.2%) courses and 164 Officials from 61 Universities comprising of Administrators/University Officers (31.7%) and Teaching Faculty (68.3%) had participated in the survey.

About 84.0 % of faculty and administrators expressed that their Universities were able to handle the impacts created by COVID-19 and about 71.8 % expressed that they had facilities for imparting digital education. A significant proportion of the respondents (41.7 %) opined that the access to online educational resources (OERs) was moderate / average, while 18.4 % responded that the access was very good. Quality of learning materials was another area of major concern, with 46% of the respondents expressing that the digital literature accessible to them are of moderate / average quality.

The broad impacts of COVID-19 on agricultural education as perceived by the University Officers (taking care of administration) / Faculty Members (engaged in teaching) and the students based on the survey are presented briefly under three broad heads viz., (i) course delivery, (ii) building professional competence, and (iii) physical and psychological health.

2.1. Impact on Course Delivery

(a) Loss of academic learning time and faculty time: The lockdown imposed following COVID-19, resulted in the loss of 35 to 45 calendar days out of 50 days depending on respective State Government decisions at the end of lockdown 2.0 (3-5-2020). The loss of effective academic learning time and effective faculty time (includes time for other activities apart from actual teaching such as preparation, evaluation of records, answer scripts, assignments, etc.) ranged from 210 to 270 hours per student and 235 to 300 hours per Faculty Member across the Agricultural Universities in India. The States with larger number of students/ Faculty members had greater extent of loss.

(b) Disruption of academic activities: All higher Agricultural Education Institutions were closed physically and though a few Universities started their online programmes and online engagements, disruption of academic calendar and activities were inevitable fallout of the lockdown (Fig 2a). The universities and other tertiary education institutions were closed in 175 countries and communities, and over 220 million post-secondary students - 13% of the total number of students affected globally - have had their studies ended or significantly disrupted due to COVID-19, as on April 8, 2020 (The World Bank Group, 2020).

(c) Loss of experiential learning: Unlike traditional degree programmes, courses of agricultural and allied sciences have built-in practical components (around 30%) and experiential learning modules through field experiments and village visits. The lockdown vanished these learning experiences. While the online engagements of the Faculty
Members partially contributed to the knowledge component, but the lockdown had severely impacted the skill component (Fig 2a).

(d) Uncertainty on career progression schedule: This issue was particularly predominant among the students in the final year of their under-graduation and post-graduation in terms of planning their next logical career progression i.e., taking up higher studies, preparing for competitive exams and/or taking up employment in private or public sector (Fig 2a).

The uncertainty was particularly more pronounced among those who aspired to go for a suitable placement, in the light of shrinking employment opportunities in both private and public sector, following the huge impact of the COVID-19 on the economy.

(e) Restricted social learning: Apart from well-structured instructions, learning also happens among students due to their engagement in practical classes or project-based assignments. The courses of agriculture and allied sciences have a unique design in which all undergraduate and postgraduate students, particularly those in social science area, are engaged in the social learning process. They would get to learn through observation of people's behaviours, and also learn from each other under and from wider social-ecological systems. Lack of access to these social contexts inbuilt in the Agricultural Education Institutions during the lockdown, compromised the opportunities to students from acquiring these experiences (Fig 2b).

2.2 Impact on Building Professional Competencies

(a) Issues related to gaining knowledge: The courses for a typical undergraduate programme in agriculture and allied sciences are well-structured with about 18 to 24 credits of theory and practical classes, per semester, depending on their year of standing. Due to the loss of significant instructional time, the students could not have as much knowledge gain as under normal circumstances, in spite of the significant efforts taken by the Universities to establish online teaching programmes scheduled during most part of the lockdown (Fig 2b).

(b) Issues in skill acquisition: Most of the agricultural courses have a significant practical component (about one-third) in the course structure, which contributes towards skill upgradation. The course structure also provides for experiential learning, project-based learning and activity-based learning through peer interaction. This component was the most affected one due to the lockdown impact with the closure of all Institutions/Universities and many times imparting skills through online is a challenge (Fig 2b).

(c) Inadequate access to faculty mentoring / counselling: All the Agricultural Universities have a unique structure for enabling personalized mentorship for the students by instituting Course Coordinators / Student Advisors and few Councillors for each batch of the students across the graduation levels. The benefits to the students through interaction with their Coordinators / Advisors / Councillors, who otherwise constantly stay engaged with the curricular and co-curricular activities of the respective batches were marginally affected due to displacement of students, while some of the respondents opined that they could still stay engaged with them in these difficult times when the students have low morale (Fig 2b).

2.3 Impact on Physical and Psychological Status

(a) General health: As the lockdown largely restricted the mobility of the people, albeit temporarily, the perception of students on their physical health viz. body weight, blood pressure, physical activity, nutrition & diet, and rest & sleep were studied. The respondents comprising of students of Undergraduate, Post graduate and Doctoral degrees, in the age group of 17 to 27 years opined that lockdown had a significant restriction on physical activity (25%) and improved rest and sleep (26%), while they
did not perceive any change in their body weight (34%), blood pressure (61%), and nutrition and diet (24%) due to lockdown (Fig. 3).

**(b) Psychological health:** The study indicated that the students perceived a significant impact of COVID-19 / lockdown on their psychological wellbeing. They considered that the lockdown adversely affected their self-confidence (29%) and overall attitude (23%); caused boredom (46%), frustration (36%), anxiety (32%), depression (29%), uncertainty (30%) and desire for cocooning (25%), and ultimately led to loss of collective / group behaviour (38%). The perceptions on the adverse impacts of lockdown varied significantly (p<0.05), higher among the PhD students than PG and UG students. The frustration and anxiety levels were more among the PhD students (about 50%) compared to their UG counterparts (29%; 26% respectively) (Fig. 4). These parameters play a significant role in the overall mental health and resilience of the students. It is required to periodically monitor them against these parameters to ensure that they are able to/have resumed their normal activities, as the lockdown comes to an end. Psychological counselling is to be facilitated in case of the needy students who are unable to recover from the psychological impacts fully on their own.

The respondents considered that strengthening the connect between the Faculty and students through regular online sessions / pre-recorded videos, etc. would help to tide over this issue.
3. Preparedness of Agricultural Universities to the Change Post-lockdown

Though COVID-19, the global pandemic posed an unprecedented challenge and caught all the academic institutions unaware, the Agricultural Universities across India found their own ingenious ways to continue nurturing the teaching-learning experiences. All the Universities took appropriate precautionary steps, as advocated by the Union and State Governments from time to time, to maintain the safety of the students, faculty and other staff members. Many student hostels in different Universities were converted into COVID-19 Isolation / Quarantine Centres. Apart from general sanitary measures, many Universities had facilities to conduct online classes (93.87%). Indian Council of Agricultural Research has been promoting and supporting digital education in SAUs, through financial support for creation of infrastructure and capacity building of Faculty Members. The World Bank supported National Agricultural Higher Education Project (NAHEP) implemented by ICAR has aided in the creation of state-of-the-art digital infrastructure and courseware in different Agricultural Universities.

The preparedness of the Agricultural Universities notwithstanding, the local internet connectivity issues in some institutions located in rural areas hampered the effective implementation of the programmes as envisaged. A vast majority of the University Officials and Faculty Members expressed their readiness to cope with the impacts of COVID-19 on Agricultural Education.

While there was an overwhelmingly positive response from across the University Officers and the Faculty Members on the need and readiness to adapt to the emerging scenario, the survey indicated that the confidence of University Officers in terms of their preparedness was
significantly (p<0.05) higher than that of the Faculty Members, within some Universities.

The key inferences drawn through the study among the University Officers and Faculty Members are summarized hereunder.

3.1 Coping Capacity

Most of the University Officers and the Faculty Members considered that the institutions have inherent capacity to cope with the new challenge created by COVID-19 and are equipped to handle the disruptions more proactively.

3.2 Need for a Paradigm Shift

Several changes are happening in the educational technology and/or methods. Online platforms are used for teaching and assessment (Zoom, MS Teams, Google Classroom, Flipped classrooms, etc.) in addition to social media by many higher education institutions across the globe. Time has now come to shift from the traditional approach to modern blended approach and integrate EdTech into higher education. The experimentation at scale of adoption of online education triggered by the pandemic will speed up the learning curve of universities and provide them with perspective to enrich campus-based programs with online elements in a way that aligns with demands from new generations of students and a world of work increasingly penetrated by technology (The World Bank Group, 2020).

The current situation has called for a reaction of same measure and urgency to bring in novel and pragmatic changes in the present education system by integrating sophisticated approaches. And now is the best time to institutionalize digital teaching, and all steps in this regard need to be proactively undertaken on a fast-track with a vision on future challenges and prospects. Majority of the institutions have the basic minimum facilities required for digital education and this transition could be infused with reasonable ease.

3.3 Strengthening Linkages

The Academia-Industry-Government are the three important institutions which influence and impact the quality of agricultural education in the country. The harmonious linkages among these three pillars are essential in terms of improving the agricultural education and facilitate knowledge and technological (eg. software support and grid computing) exchange and transfer.

3.4 Enabling Policy

The current policies pertaining to education management like entrance exams, admissions, class room sessions, examinations, evaluation, etc. are essentially designed based on the traditional educational programmes and the current contingency provides an opportunity to bring in adequate innovative methods and flexibilities in each of the steps so as to make the education system robust enough to respond to the current pandemic impact and future similar challenges, as well. However, the policy should embrace a multi-faceted redundant approach to innovation to tackle these contingencies, as an alternate strategy.

4. Adapting to the New Normal

The disruption caused by the pandemic has provided an opportunity to re-imagine agricultural education in India. Strategies that would aid in the transition of the institutions to the new normal are listed below.

4.1 Institutionalize Social Distancing

Extra care has to be taken to institutionalize stringent norms to stay away from the impacts of the pandemic. As the messages inculcated among the students in the educational institutions, will have a ripple effect in terms of creating a more informed society in terms of handling / coping with the pandemic situation, they should be effectively utilized to create nudging effect on society through constant reinforcement.

Given the exigency associated with the pandemics and vulnerability to the disease,
the classrooms and curricula have to be made amenable to adhere to social (physical) distancing. While the existing classroom size may not be readily adequate for the purpose, the Agricultural Universities, should innovate their content delivery so as to comply with social distancing. In this regard, Agricultural Universities will be better placed to maintain physical distancing, because they have large campuses and the number of students is far less compared to General Universities.

Institutions with limitations in terms of availability of space, physical infrastructure and faculty strength, may integrate innovative approaches to ensure social distancing viz., conducting classes in multiple sessions; handling some sessions through synchronous online platforms; extending the working hours, etc. Dividing the students into more batches and reducing the number of students in the classroom may be adopted, where teachers are not in shortage. Students may also be grouped into cohorts who have common interests, ensuring active engagement. Creation of project-based learning activities, student-faculty collaborative projects, engagement of students in community activities on a regular basis etc. may be used for more social interactions.

4.2. Contingency Planning

With the Government policy of trying to live with COVID-19 henceforth expectantly, and the possibilities of newer outbreaks, there is need for developing contingency plans factoring local situations, for the unforeseen situation of the University staff / students getting infected by COVID-19. Under the new normal, all University campuses shall stay prepared for a possible fresh flare ups of COVID-19. As part of the contingency planning, big campuses shall plan to have a Quarantine Unit, so that academic activities can be continued without much disruptions.

Standard Operating Procedures (SOP) for the educational institutions in general, and other specific places (classrooms, library, hostels, playground, and common place for social interaction) in particular need to be developed innovatively for various scenarios (normal, moderate risk, significant outbreak, etc.), keeping in view the local conditions, existing physical infrastructure, etc. As students would be coming from different parts of India, screening and contact tracing may also be required.

4.3. Student Counselling

As students have undergone a significant stress and anxiety during this period due to the disruption of the academic programme and differences in their resilience and coping capacity, the Universities shall engage/empanel the services of educational psychologists/counsellors in order to help the students to come out of the stress and anxiety related issues.

As advisors or guides, the Faculty Members can also regularly be in touch with the students and interact with them. Capacity to give counselling and mentoring online is a skill that many Faculty Members might not be exposed to till now. In the light of this emerging situation, the capacity of the Faculty Members has to be enhanced in educational psychology so that they will be able to help the students in their capacity as student counsellors / research guides to tide over the issues related to anxiety.

4.4. Keep-up Faculty Morale

With the changes envisaged to redesign the educational programmes of the institutions, Faculty Members would have significant pressure in terms of coping with the academic load, challenges in adapting to new modes of course delivery in addition to dealing with the threats associated with enhanced contacts with students assembling from different areas. Once the educational institutions start their academic sessions, the teachers and associated staff would join the band of other warriors alongside health workers, sanitary workers, police, etc., given their nature of work. Hence, every effort has to be taken to recognize the extent of additional tasks, build their capacity and also incentivize performance.
4.5. Ensure Access to Gadgets

The success of the conversion of significant classroom content as online content depends on the access of all the students to personal digital equipment viz., laptops, desktops, tablets, smart phones, etc. As vast majority of students of agricultural students hail from rural background, possession of these gadgets cannot be assumed as certainty and hence, necessary schemes from state governments or central government may be explored to provide appropriate gadget(s).

4.6. Curricular Changes

Considering the impact of COVID-19 lockdown and subsequent expectations for continuous uninterrupted learning, the Agricultural Education System should introduce a new online course on digital literacy, a non-credit, yet compulsory course for all UG students, covering different learning tools, Learning Management Systems and their use.

4.7. Capacity Building of Faculty Members

The majority of Faculty Members are not trained to use on-line platforms for taking classes. Many of them expressed doubts on the change in behaviour towards digital learning, which possibly could be attributed to their inadequate confidence in delivering the content online, as effectively as they are used to offline/ classroom sessions. Hence, tailor-made modules on building and delivering digital content have to be developed by national institutions and delivered through MOOC platform to equip all the Faculty Members of Agricultural Universities in a short time.

4.8. Capitalize on the Virtual Talent

Once having the virtual classes, the University can hire part-time Faculty, who need not to stay in the University, who may be from other Universities/Institutions in India or abroad. The Universities shall draw fresh guidelines for engaging Visiting Faculty, Guest Faculty and Adjunct Faculty, in order to enable and accommodate the possibility of virtual engagement. This may also aid in addressing the issues related to faculty-student ratio.

ICAR-National Academy of Agricultural Research Management (NAARM) has been organizing series of capacity building programs (Foundation courses, tailor-made focussed programs) in various modes viz., in-campus, off-campus, online, especially Massive Open Online Course (MOOC) platform covering various aspects of education technology and management, reaching over 20,000 beneficiaries across NARES. During 2019, about 3800 participants from across the country participated in various programmes (76) of the Academy, which included need-based training programmes (45) and off-campus (20) training programmes in various parts of the country and one Massive Open Online Course (MOOC). While almost all the programs have significant modules pertaining to use of digital technology, 13 programmes were exclusively focused on educational technology and management.

While these interventions were not designed to prepare and equip the Faculty Members of Agricultural Universities for a situation as of now, the investments on the physical infrastructure and on enhancing the competence of human resource have certainly contributed in building their coping capacity and in reducing their response time to the unprecedented situation caused by the pandemic.
4.9. Learner-centric Teaching

The current situation has provided for enhanced use of digital platforms for course delivery, which in turn has given an additional benefit in terms of infusing a paradigm shift in education from teacher-centric methodologies to learner-centric methodologies. More emphasis on self-paced learning, and individual learning to be institutionalized. Platforms that capture the digital learning needs, learning abilities of the students and facilitate adaptive learning need to be developed and institutionalized. Use of artificial intelligence has significance in mapping students learning abilities and adapting the teaching content accordingly.

4.10. Enhanced Online Engagement

During the lockdown period, there is a significant shift in the perception among the students and Faculty on the possibility of conducting the courses through online modes. The Universities should capitalize this momentum and encourage and incentivize online engagement. The regulations need to provide for hybrid educational models enabling delivery of at least 25% of the course content / academic curriculum through online. A framework for ‘Teaching from Home’ has to be developed and institutionalized.

Virtual classrooms will facilitate comfortable and optional space and time for asynchronous learning and repeated view of tutorials at will for comprehension. It will also facilitate student-faculty interactions through video-chats and conferencing which will not only strengthen the individual rapport with the other but also encourage students to discuss the issues without classroom inhibition. The faculty also can concentrate on individual students’ tutorial needs, ensuring the student’s in-depth understanding of the subject matter.

4.11. Development of Institutional Infrastructure

Priority should be accorded to providing high speed internet connectivity; acquisition of internet tools/applications compatible to cloud platforms; strengthening access to learning tools/apps; development of videos, virtual classrooms, smart classrooms; establishment of regional technology enhanced learning labs for content development and broadcasting by all the SAUs.

The networked grid computing, with support of e-learning infrastructure would meet the requirements of accessing course materials from across the faculties and students in various research fields. The grid computing can connect innumerable faculty members and students, unparallel to traditional classroom teaching with limited infrastructure.

The virtual classrooms would aid in connecting geographically scattered students to the university faculty. Educational materials shall be made available through high-storage computing systems with unlimited access; Libraries to be integrated with search engines for sourcing reference and educational materials as digital contents; video conferencing facilities to be established for knowledge exchange and expert counselling.

The preparedness of the Universities notwithstanding, the local internet connectivity issues in some institutions located in rural areas may hamper the effective implementation of programmes as envisaged. Hence, necessary connectivity needs to be ensured for the programmes to be effective. All SAUs shall be brought under National Knowledge Network (NKN) Asynchronous mode of teaching may reduce the difficulties of online live classes (synchronous) to some extent in poorly connected areas. The private network players and IT companies may be roped in to provide better connectivity.
Adoption and integration of online learning in agricultural education is riddled with challenges beyond teaching and includes issues of equity, infrastructure, broadband capacity, pedagogic capacity in remote delivery, issues in delivering practical content, assessment methodologies and policy changes in terms of regulations, etc. Indian Agricultural Universities need to build on the experiences of other successful models and develop one that factors all local issues and concerns of faculty competencies, student aspirations and physical infrastructure limitations.

4.12. Readiness for Virtual Teaching - Learning

Development of online courseware viz. MOOCs, e-books, e-courses with animations, simulations, live conferencing applications, digital informative videos relevant to agricultural education and ensuring of student engagement and interactivity are fundamental for the transition to online teaching-learning.

In the light of the emerging situation, innovative ways need to be explored to develop alternatives for on-field and off-field practical trainings to students. Online content has to be generated using 3D animation videos on the model fields to show activities such as land/field preparation, soil and water amendment, seed germination, grafting, plant growth management, machinations, harvesting techniques, post-harvest processing, etc., building on the learnings from medical education and basic biology. The lessons in developing animations available in molecular biology and life sciences, wherever feasible, should be used to develop and use such materials for agricultural sciences towards enhancing learning effectiveness.

While some Faculty Members from a few Universities, on their own interest, are using WhatsApp, Facebook, Google Classroom, Video Conferencing, Zoom, Microsoft Teams, Virtual Class rooms, Google Suite, Skype, and also online platforms like Coursera, Edx, Khan Academy, SWAYAM etc., which are making an impact in their regular educational activities. There is a need to integrate the use of certain identified online tools/applications as a national strategy across all the SAUs.


Experiences during the lockdown period with many online sessions and webinars are that the connectivity and bandwidth issues significantly influence the successful implementation of the programme. Thus, the state has to invest significantly on enhancing the bandwidth while the Universities shall focus on the development of online modules which will be less demanding on the bandwidth.

There is need to develop a national platform for online education in agriculture and allied subjects. Technical and pedagogical standards for online teaching need to be developed and institutionalized through appropriate validation mechanism by all the Agricultural Universities in the country. The platform should also provide for bringing together all the alumni, employers, and entrepreneurs onto a national platform so as to ease in their career progression – be it for higher education or employment. Such platforms shall aid in strengthening the linkages among the academia, industry and government organizations.
4.12. Readiness for Virtual Teaching -

The limitations. factors all local issues and concerns of faculty competencies, student aspirations and physical infrastructure. Agricultural Universities need to build on the experiences of other successful models and develop one that delivers practical content, assessment methodologies and policy changes in terms of regulations, etc. Indian includes issues of equity, infrastructure, broadband capacity, pedagogic capacity in remote delivery, issues in Adoption and integration of online learning in agricultural education is riddled with challenges beyond teaching national strategy across all SAUs. identified online tools/applications as a need to integrate the use of certain regular educational activities. There is a etc., which are making an impact in their Coursera, Edx, Khan Academy, SWAYAM Skype, and also online platforms like Teams, Virtual Class rooms, Google Suite, Video Conferencing, Zoom, Microsoft WhatsApp, Facebook, Google Classroom, Universities, on their own interest, are using While some Faculty Members from a few transition to online teaching-learning. interactivity are fundamental for the relevant to agricultural education and applications, digital informative videos animations, simulations, live conferencing Development of online courseware Learning materials for agricultural sciences towards should be used to develop and use such biology and life sciences, wherever feasible, developing animations available in molecular education and basic biology. The lessons in building on the learnings from medical techniques, post-harvest processing, etc., harvesting seed germination, grafting, plant growth preparation, soil and water amendment, how active activities such as land/field showing actions such as land/fiel
Adapting to Unanticipated Global Change: An Inflection Point*

Glen C. Shinn
Emeritus Professor of Texas A&M University and Member, NAHEP International Advisory Panel

If there was ever a question about the consequences of change, 2020 underscored the impact of turbulence and chaos. Although global pandemics accelerate disruptions, change typically is a natural evolutionary process that may go unnoticed. Not today! Changes that were once delayed now become crucial due to a pandemic. Organizations that develop knowledge, influence policy, and prepare present and future leaders must overcome ‘business as usual’ mentality to meet the challenge of uncertainty. The future is likely a new game with new rules and metrics.

**International Practices and Models**

Under uncertain environments, success and sustainability begin by building a multi-directional communication strategy. Remapping and communicating the new operating environment are critical to creating an active environment for change. Effective planning and its execution would aid to ensure that learning remains virtually uninterrupted.

**Adopting Education and Training Policies: By Administrators**

The first policy step examines first-order questions about reality, followed by documenting evidence of the magnitude of the chaos and potential coping strategies. Response time is critical but relies on regular conversations that include a comprehensive set of stakeholders for more reliable set of facts and narratives. Forward observers provide field conditions that affect policy, strategies, and tactics. After-action-reviews (AARs) are useful for step-by-step reflection during and after each cycle of an initiative. Defer “permanent” decisions until the pandemic environment stabilizes. Success hinges for institutions that are thoughtful, creative, productive, and play to the middle position. Encourage an institutional pivot into a new world.

**Adopting Education and Training Transformations: By Middle-Managers**

Middle managers, as connectors, must maintain crucial linkages between "policy-makers" and the "front-line." Stress Maslow’s hierarchy of needs, beginning with personal safety, and Max-Neef’s interrelated and interactive model of human-scale development. Middle-Managers should monitor the need for psychological & medical services. Reprioritizing course offerings are based on the needs of the learner and learning domains. The reprioritization leads to a systematic remix of content, remediation, quality, process, and faculty development. Consider using blended pedagogical models as delivery alternatives while providing skills and encouragement for faculty and students unprepared for new learning technologies.

**Delivering Education and Training: By Faculty and Staff**

Faculty and staff lead the formal and informal education, laboratory, and field training. Examine the effects of pilot strategies and case studies before pandemic disruptions. Design courses for alternative delivery methods while accommodating the technologies of student-clients. Create course syllabi with options to quickly adapt to changing field conditions while establishing a standard threshold of subject knowledge, pedagogy, and assessment. Collaboratively select a cross-discipline digital platform that is manageable by the learner. But most importantly, demonstrate empathy while students navigate the unknown.

*Views do not necessarily represent the positions, strategies or opinions of The Texas A&M University System or its entities.
Salient Recommendations

Ensuring that learning remains uninterrupted during the global pandemic

1. **Institutionalize social (physical) distancing** through innovating in classroom structure, course delivery, teaching and learning methodologies, as per local situations. Contingency plans and standard operating procedures (SOPs) shall be prepared for dealing with the pandemic in the institute campuses, ensuring safety to staff and students.

2. **Establish student psychological counselling cells** in all Universities to help students tide over the depression and anxiety due to the situations created due to the pandemic.

3. **Build competence of faculty members** in using digital technology for education including online teaching, course development and delivery and also on educational psychology so as to enable them to perform as Student Counsellors, effectively.

4. **Ensure that all students have access to gadgets** and have adequate capacity to acquire education through online platforms. Necessary changes in the curriculum has to be made to instill necessary skills in this regard through a structured course in the undergraduate program.

5. **Strengthen the digital infrastructure in all Campuses** within the University for enabling seamless transition to the new paradigm and effective e-learning. All universities shall be brought under National Knowledge Network (NKN) to enhance connectivity and asynchronous mode of teaching may be used to reach students from rural areas with poor internet connectivity.

6. **Innovate to engage experts virtually** from across research / academic institutions from India / abroad as Visiting Faculty, Guest Faculty and Adjunct Faculty using digital platforms to enhance access to talent and to bridge issues in student-faculty ratio.

7. **Leverage technology to bring in a paradigm shift** from teacher-centric teaching methodologies to learner-centric approaches, so as to provide for adapting the course content based on the learning abilities of the students.

8. **Bring in academic reforms incentivising enhanced online engagement** between teachers and students by providing for hybrid educational models enabling delivery of at least 25% of the course content / academic curriculum online, to start with. A framework for “Teaching from Home” has to be developed and institutionalized.

9. **Develop digital content (3D-animations, simulations, models, videos, etc.)** in a time-bound manner, for effective teaching of theory and practical classes of various agricultural courses. It may be undertaken through a national collaborative approach partnering with private firms.

10. **Develop a national platform for online education** in agriculture and allied subjects. Technical and pedagogical standards for online teaching also need to be developed and institutionalized by all the Universities.
References / Additional Reading


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Re-imagining Higher Agricultural Education in India on the Face of Challenges from COVID-19 Pandemic