P-ISSN: 2618-0723
E-ISSN: 2618-0731

NAAS Rating: 5.04
www.extensionjournal.com

International Journal of Agriculture Extension and Social Development

Volume 8; Issue 2; February 2025; Page No. 409-415

Received: 03-01-2024
Accepted: 08-02-2024

Indexed Journal
Peer Reviewed Journal

Exploring online education constraints in agricultural sciences: Experiences from teachers and students at Pjtau, Telangana, India

[1]Soujanya Kotte, [2]Madhu Babu K, [3]Venu Gopala Reddy Ch, [4]Malla Reddy M and [5]Srinivasa Chary D

[1]Ph.D. (Ag.) Scholar, Department of Agricultural Extension Education, College of Agriculture, Rajendranagar, PJTAU, Hyderabad, Telangana, India

[2]Professor, Extension Education Institution, PJTAU, Rajendranagar, Hyderabad, Telangana, India

[3]Professor and Dean of Student Affairs, Administrative office, PJTAU, Rajendranagar, Hyderabad, Telangana, India

[4]Professor and Controller of examinations, Administrative Office, PJTAU, Rajendranagar, Hyderabad, Telangana, India

[5]Associate Professor, Department of Statistics and Mathematics, College of Agriculture, Rajendranagar, PJTAU, Hyderabad, Telangana, India

DOI: https://www.doi.org/10.33545/26180723.2025.v8.i2f.1671

Corresponding Author: Soujanya Kotte

Abstract

The present study adopted an *Ex-post facto* research design to assess the constraints faced by teachers and students during the online teaching-learning process in Professor Jayashankar Telangana Agricultural University (PJTAU), Telangana, during the 2020-21 academic year. The research was conducted across six agricultural colleges offering B.Sc. (Hons.) Agriculture programs. The study sample included 80 teachers, comprising 47 Assistant Professors, 14 Associate Professors, and 19 Professors, along with 240 students representing the 2019 and 2020 admitted batches. A proportionate random sampling technique was employed to ensure adequate representation from all selected colleges. The data collection instrument, designed to capture the experiences during online teaching-learning, underwent reliability testing using Cronbach's alpha, yielding a reliability coefficient of 0.82, indicating a high level of internal consistency. Following pre-testing, ten major constraints were identified for both teachers and students. These were subsequently ranked using Garrett's ranking technique, which enabled the computation of mean scores and prioritization. Among teachers, the most pressing constraints included technical issues, digital incomprehensibility, and students' hesitation to interact, followed by increased workload, lack of proper assessment tools, and difficulty in assessing student understanding. Students reported lack of proper digital devices, poor internet connectivity, and inadequate technical skills as primary challenges, alongside limited interaction with teachers, lack of motivation for self-learning, distractions at home, and cognitive fatigue. The findings underscore the urgent need for enhanced digital infrastructure, improved technical support, pedagogical innovations, and psychosocial interventions to create an inclusive, engaging, and effective online learning environment for agricultural education.

Keywords: Online teaching-learning process, *ex-post facto* research design, Garrett's ranking technique, constraints, agricultural education, digital incomprehensibility, cognitive fatigue, student engagement, assessment tools, PJTAU

Introduction

The rapid integration of Information and Communication Technology (ICT) into the education system, particularly through platforms such as SWAYAM, Swayam Prabha, e-PG Pathshala, and institutional tools like Zoom, Webex, TCS-iON, Google Classroom, and WhatsApp, has significantly transformed the teaching-learning process in higher education institutions. While these digital platforms have played a crucial role in ensuring the continuity of education, particularly during and after the COVID-19 pandemic, the transition to online learning has not been without challenges.

The National Agricultural Higher Education Project (NAHEP) has also played a vital role in strengthening the digital infrastructure in agricultural universities, ensuring that students and faculty are equipped with the necessary technological competencies to thrive in a blended learning environment. This evolving educational paradigm has highlighted the importance of integrating technology into teaching practices, fostering flexible, accessible, and student-centric learning experiences.

PJTAU Teachers, students, and researchers-key stakeholders in the educational ecosystem-have encountered a range of constraints in effectively adapting to and participating in online teaching and learning. These constraints arise from technological limitations, infrastructural inadequacies, and personal and institutional readiness for digital learning. Understanding the specific constraints faced by respondents, is essential for improving the quality, accessibility, and inclusivity of online education.

In this context, it becomes imperative to systematically assess the challenges experienced by respondents to identify critical areas requiring intervention, thus ensuring that

digital learning platforms are optimized to meet the needs of all users. The insights gathered from such assessments can guide educational institutions and policy makers in developing effective strategies to enhance the overall online learning experience while addressing the barriers that hinder seamless participation.

Objective of the study: To identify constraints faced by teachers and students in PJTAU during online teaching-learning process.

Review of literature

Amita (2020) [3] in a study on "e-learning experience of students" concluded that poor internet connectivity problem was ranked I followed by problem in choosing best source due to flooding of information (Rank II), non-availability/affordability of e-learning resources like laptop/desktop at home (Rank III), lack of adequate technical skills (Rank IV) and electricity problem (Rank V) as barriers in online learning.

Singh *et al.* (2020) observed that lack of face-to-face interaction with teachers, inconvenience in clearing their doubts, the level of distraction while online learning as compared to classroom were the major challenges faced by students in online education.

Haider and Al-Salman (2020) [10] found that prolonged use of e-learning tools was associated with numerous health issues, including tiredness, boredom, nervousness and tension, in addition to having an adverse effect on their sleep patterns.

Ahammad (2021) [1] in a study on "Online learning initiatives" reported that less than one-fourth of participants claimed network problems (22.00%), followed by technical problems (14.00%), lack of knowledge about online-learning platform (13.00%), expensive (11.00%), understanding problems (9.00%), equal proportion of 8.00 percent each claimed online learning content is not appropriate according to the needs of learners, lack of advance software, security problems and lack of time flexibility (7.00%) as barriers while using online learning platforms.

According to Dhivya and Rajasekaran (2021) [7] the main obstacle to online learning was a lack of connectivity, including network issues, slow data, etc. The findings indicate that a significant proportion of students, particularly those from remote areas, struggle with the digital divide and unequal access to the internet. The absence of devices, inadequate learning environments, difficulty to focus on screens, little to no face-to-face interaction, and fear of using new technology were placed second, third, fourth, fifth, and sixth, respectively.

Muthuprasad *et al.* (2021) [14] in a study on "Students' perception and preference for online education in India" concluded that lack of connectivity was ranked I followed by data limit (Rank II), data speed (Rank III), little/no face-to face interaction (Rank IV), intense requirement for self-discipline (Rank V), lack of device (Rank VI), poor learning environment (Rank VII) and technophobia (Rank VIII) as constraints in online learning.

Almaiah *et al.* (2020) [2] identified critical challenges and factors influencing the e-learning systems during this COVID-19 pandemic. The three main challenges identified were change management issues, e-learning system technical issues and financial support. Respondents stated that the critical factors that needs to be addressed and should be taken in the future plans were technological factors, e learning system quality factors, trust factors, self-efficacy factors and cultural aspects.

Dhawan (2020) [6] conducted strengths, weaknesses, opportunities and challenges (SWOC) analysis of online learning in this time of global pandemic. Reported weaknesses were technical difficulties, learner's capability and confidence level, time management, distractions, frustration, anxiety and confusion and lack of personal/physical attention. Challenges were unequal distribution of ICT infrastructure, quality of education, digital illiteracy, digital divide and technology cost & obsolescence.

Gautam (2020) [9] reported that online learning has its own set of positives and negatives. The disadvantages of online learning were inability to focus on screens, technology issue, lack of teacher's training and increase in screen time. Teachers had very basic understanding of the technology and sometimes they did not even have the necessary resources and tools to conducts online classes. To combat this, training of teachers with the latest technology updates is necessary so that they can conduct their online classes seamlessly.

Hasan and Khan (2020) [12] reported poor network and connectivity as the most disliked elements of online learning. Adding to it, lack of interaction, distractions and one-sided learning were mentioned as its disadvantages. Online safety and security issues were not addressed and disabled students experienced teachers' negligence and lack of support.

According to Haron *et al.* (2021) [11] there were five key problems that the students had to deal with online learning: network and bandwidth restrictions, a lack of engagement, difficulty learning technical subjects, the new normal for class interaction, and stress. The main issue with online teaching and learning is network and bandwidth limitations.

Naik *et al.* (2021) [15] through a study on online teaching and learning during lockdown confirmed that the traditional chalk and talk methodology is often better than online sessions. Lack of facilities, infrastructure, technical tools and the internet access are the major drawback for conducting online sessions. During online classes many faculties often faced problems in teaching special subjects which need face to face interaction. Few students expressed that for practical and problematic subjects, online teaching was often difficult to understand.

According to Saha *et al.* (2022) the teachers' most significant barriers were difficulty with practical work, followed by difficulty supervising students and inadequate feedback. Less student - teacher interaction, less usefulness for assessment, lower student involvement, minimal student interest, poor network connectivity, along with a lack of proper regulations were the other apparent difficulties for teachers.

Research Methodology

An *Ex-post facto* research design was adopted for the study, since the variables chosen for the study have already occurred, researcher does not have direct control on

influencing (independent) variables. The study was conducted in Professor Jayashankar Telangana Agricultural University in Indian State of Telangana. Teachers and students, who have been involved in the teaching- learning process through online teaching-learning platforms during the first and second semesters of 2020-21 were considered for the study. Data was collected from a total of 80 teachers and 240 students. Proportionate random sampling was followed to select the teachers who taught B.Sc. (Hons.) Agriculture, among six Agricultural colleges of the PJT Agricultural University. Six (6) agricultural colleges of Professor Jayashankar Telangana Agricultural University, which offered courses in B.Sc. (Hons.) Agriculture, through online teaching-learning platforms during the first and second semesters of 2020-21 were considered for the study. The colleges are (1) College of Agriculture, Rajendranagar (2) Agricultural college, Aswaraopet (3) Agricultural college, Jagtial (4) Agricultural college, Palem (5) Agricultural college, Warangal, and (6) BJR Agricultural College, Sircilla. This study aimed to know, the constraints faced by the respondents during the online teaching learning process. The instrument designed to measure the experiences of teachers and students, underwent a reliability analysis using Cronbach's alpha, which yielded a reliability coefficient of 0.82, indicating a high level of internal consistency. From the identified constraints during pre-testing, top ten constraints were finalised and the respondents were asked to rank these statements according to their priority. Then, based on Garrett's score card, mean score is calculated and ranking was done. The instrument was administered to 80 respondents which included (47) Assistant professors, (14) associate professors and (19) professors, and 120 students of 2019 admitted batch and 120 students of 2020 admitted batch, total students constituting 240.

The Garrett Ranking technique is a widely used statistical tool for ranking factors or variables based on respondent preferences. It converts ranks into scores using a specific formula and a standard table of values developed by Henry Garrett and Woodworth (1969).

Formula for Garrett Ranking

The percentage position (*P*) of each rank is calculated using the formula:

$P=\{100(R_{ij}-0.5)\}/N_j$

Where:

R_{ij} = Rank assigned to the i^{th} factor by the j^{th} respondent.

N_j = Total number of factors ranked by the j^{th} respondent.

The percentage position is then converted into scores using a standard Garrett table. The total score for each factor is computed by summing up the scores assigned by all respondents. Finally, the average score is calculated, and factors are ranked based on their average scores.

Aspects of Garrett Ranking

Calculation method: Converts ranks into percentage positions and assigns scores using a pre-defined table (Garrett Table).

Purpose: Focuses on ranking factors based on their perceived severity or importance as judged by respondents.

Precision: Provides a more nuanced ranking by converting qualitative preferences into quantitative scores.

Flexibility: Can handle varying numbers of ranked items across respondents and still produce comparable results.

Applications: Widely used in social sciences, agriculture, psychology, and decision-making studies for detailed analysis.

Output format: Produces average scores that allow for easy comparison of factors based on their relative importance.

Advantages of Garrett Ranking

1. It accounts for the seriousness or impact of factors from the respondent's perspective, unlike simpler ordinal ranking methods.
2. The use of percentage positions and conversion tables ensures consistency across varying datasets.

Limitations of Garrett Ranking

Garrett Ranking requires additional steps like converting ranks to percentages and using predefined tables, making it more complex than simpler ranking techniques like standard ordinal ranking or frequency-based methods.

Steps to determine the severity of constraints

1. **Collection of rankings:** respondents rank the constraints (or factors) based on their perceived severity or importance. Here, teachers and students were given a set of 10 items, and asked the respondents to rank according to their priority.
2. **Calculation of percentage position:** By using the formula for percentage position *(P)* given, $P=\{100(Rij-0.5)\}/Nj$
   Where:
   Rij = Rank assigned to the i^{th} factor by the j^{th} respondent.
   N_j = Total number of factors ranked by the j^{th} respondent.
3. **Conversion to Garrett scores:** The percentage positions are then converted into Garrett scores using a predefined Garrett Conversion Table. This table provides scores corresponding to specific percentage positions.
4. **Summation of scores:** The scores for each constraint are summed across all respondents to calculate the total score for each constraint.
5. **Calculation of Average scores:** The average score for each constraint is computed by dividing the total score by the number of respondents who ranked it:
   Average score = (Total Score)/(Number of Respondents)
6. **Ranking Based on Average Scores:** Constraints are ranked based on their average scores, called as mean score, with higher scores indicating greater severity.

Key features of Garrett ranking

- The use of percentage positions ensures that variations in the number of items ranked by different respondents do not affect comparability.

- By converting ranks into scores, Garrett Ranking provides a more nuanced measure of severity compared to simple ordinal ranking.

This method is widely used in studies involving prioritization or constraint analysis in fields like agriculture, social sciences, and management research.

Results and discussion

Table 1: Constraints identified by teachers during online teaching-learning process (n=80)

S. No.	ITEM	Mean score	Rank
1.	Technical Issues	69.025	I
2.	Digital incomprehensibility of students	66.00	II
3.	Lack of Student Engagement	52.1125	IV
4.	Increased Workload for Teachers	34.7125	X
5.	Non-Availability of Proper Assessment Tools	45.125	VI
6.	Difficulty in Assessing Student Understanding	40.5375	VIII
7.	Students' Hesitation to Interact	60.375	III
8.	Limited Face-to-Face Interaction	43.8875	VII
9.	Need for Constant Adaptation	36.475	IX
10.	Teachers' Spent More Time on Assignments	48.75	V

From table 1, it is evident that technical issues emerged as the most significant constraint. These may include unreliable internet connectivity, hardware malfunctions, software compatibility problems, power outages, or learning management system (LMS) failures. Such disruptions interfere with the seamless delivery of online lessons, cause frustration, and consume valuable instructional time. Digital incomprehensibility ranked 2, refers to students' struggles with understanding and effectively utilizing digital platforms, tools, and technologies required for online teaching and learning. This can arise due to limited exposure to technology, lack of digital literacy, or the complexity of educational platforms. Rank 3, Students often hesitate to participate in virtual discussions due to shyness, lack of confidence, or fear of judgment from peers. This reluctance is heightened in environments where students do not have strong peer relationships or where classroom culture does not actively foster open participation. Rank 4, Engagement levels tend to drop in virtual environments due to reduced physical presence, distractions at home, and a lack of interactive activities. Passive learning environments limit student participation, and teachers often struggle to gauge real-time student involvement. Rank 5, Teachers are spending increased time reviewing, grading, and providing feedback on digital assignments, which requires different processes compared to traditional pen-and-paper work. This additional time commitment adds to their workload. Rank 6, with mean rank 45.125, many teachers face difficulty in finding suitable online tools that can effectively assess student understanding, especially in practical subjects. Traditional paper-based assessments do not easily translate to online formats. Rank 7, with mean score 43.8875, Limited face-to-face interaction reduces the sense of community in the classroom. Teachers and students miss non-verbal cues, spontaneous discussions, and the natural rapport-building that occurs in physical classrooms.

Without in-person visual cues, such as body language or facial expressions, it is challenging for teachers to gauge whether students comprehend the content. This constraint is especially prominent in subjects requiring conceptual clarity, as it ranked 8 with mean score 40.5375. With mean score 36.475, ranked 9 is, need for constant adaptation to technology, teachers are constantly required to adapt to new technologies, teaching methods, and assessment tools, especially in evolving educational landscapes. This continuous adaptation can be mentally taxing and demotivating, especially without proper institutional support. Increased work load for teachers, with mean score 34.7125, rank 10, Transitioning to online or hybrid modes of teaching significantly increases teachers' workload. Teachers need to prepare digital content, adapt assessments, monitor online participation, and provide individualized support, all of which demand additional time and effort.

Table 2: Constraints identified by teachers during online teaching-learning process (n=240)

S. No.	ITEM	Mean score	Rank
1.	Poor Internet Connectivity	64.23	II
2.	Lack of Proper Digital Devices	71.56	I
3.	Difficulty in Understanding Concepts	35.62	X
4.	Limited Interaction with Teachers	51.33	IV
5.	Lack of Motivation for Self-Learning	45.29	VI
6.	Distractions at Home	38.88	VIII
7.	Inadequate Technical Skills	59.74	III
8.	Mental Stress and cognitive Fatigue	42.71	VII
9.	Non-Interactive Learning Methods	37.28	IX
10.	Assessment and Exam-Related Stress	50.10	V

From the table 2, the constraints prioritised were, lack of Proper Digital Devices, with mean score, 71.56, despite the university mandated minimum requirements for the course, most of the students were unable to afford. This is the most critical constraint reported by students. Many students do not have access to appropriate devices such as laptops, tablets, or smartphones capable of supporting online learning platforms. Device inadequacy - including outdated software, slow processing speeds, or lack of required applications - hinders their participation in virtual classes, submission of assignments, and accessing learning resources. Poor internet connectivity ranked 2 with mean score 64.23, Limited or unstable internet connectivity disrupts students' ability to attend live sessions, access educational materials, or participate in interactive activities. This is particularly prevalent in rural or remote areas where internet infrastructure is underdeveloped. Many students, particularly those from less technologically-immersed

backgrounds, lack the necessary digital literacy skills to navigate learning platforms, participate in virtual classrooms, or troubleshoot minor technical issues. Ranking inadequate technical skills as 3, with mean score 59.74. Limited Interaction with Teachers, mean Score: 51.33, rank 4, limited interaction with teachers. The shift to digital learning has significantly reduced direct teacher-student interactions. Without spontaneous exchanges, personalized feedback, or real-time engagement, students may feel isolated and disengaged. Assessment and Exam-Related Stress, Mean Score: 50.10, Rank: V, Students report heightened anxiety over assessments conducted in unfamiliar digital environments. Concerns about internet disruptions, technical failures, and the perceived lack of fairness in online exams exacerbate stress levels.

Lack of Motivation for Self-Learning, Mean Score: 45.29, rank: VI, online learning demands higher levels of self-discipline and intrinsic motivation. Many students, especially those accustomed to structured environments, struggle to maintain focus and regulate their learning schedules in isolation. Mental Stress and cognitive fatigue, this constraint refers to the combined impact of psychological stress and cognitive fatigue arising from prolonged engagement in online learning environments. Cognitive fatigue, in particular, stems from sustained concentration on-screen activities, processing digital information, navigating multiple platforms, and constant adaptation to evolving technological tools. Additionally, the absence of physical peer interaction, feelings of isolation, and anxiety about academic performance further exacerbate mental stress. Students are required to process large amounts of information in non-traditional formats, contributing to mental exhaustion more quickly than in face-to-face settings, ranked 7 with mean score 42.71. Non-Interactive Learning Methods, Mean Score: 37.28, rank 9, many virtual lessons rely heavily on passive lectures, with limited opportunities for students to actively participate. Such approaches fail to capture attention and reduce deep learning opportunities. Just as mentioned by teachers, the digital incomprehensibility is rightly mentioned by students too. With rank 10, Mean Score: 35.62, Difficulty in Understanding Concepts, where, students struggle to comprehend complex concepts without face-to-face explanations, peer discussions, or hands-on activities. The lack of immediate clarification opportunities compounds this issue.

Summary and Conclusion

To summarise, Teachers encountered a wide array of challenges while transitioning to digital and blended learning environments. One of the most pressing issues was technical difficulties, including unstable internet connectivity and software incompatibility, which often disrupted online classes. Closely related to this was *digital incomprehensibility*, where teachers struggled to understand and navigate the multitude of online platforms and educational technologies without sufficient training and prior exposure. Maintaining student engagement also emerged as a major hurdle, with students often disengaging due to distractions, low motivation, or passive learning methods. Teachers reported that their workload increased significantly, with the need to redesign lesson plans for digital delivery, monitor online assignments, and provide individualized support to students.

Compounding this was the *non-availability of suitable assessment tools*, which made evaluating student progress difficult in virtual settings. Teachers also faced challenges in accurately assessing students' understanding, particularly in the absence of in-person cues such as facial expressions and body language. Additionally, many students hesitated to actively participate in online discussions, further complicating teachers' ability to foster interaction and collaboration. The lack of face-to-face interaction weakened teacher-student rapport and limited opportunities for spontaneous feedback. Teachers also had to continuously adapt to evolving digital tools and pedagogical strategies, leading to professional fatigue. Finally, the time required for reviewing and grading digital assignments was significantly higher than for traditional assessments, adding further strain to teachers' already heavy workload

Strategies for Addressing Teacher Constraints

1. **Technical Issues (Rank I):** Universities may invest in reliable and robust technologies and offer technical training and support. Establish dedicated IT support teams; computer infrastructure should be developed.
2. **Digital Incomprehensibility (among Students) (Rank II):** During induction into B.Sc. (Hons.) Agriculture courses, sensitization of the courses should be done along with necessary technology training and clear communication of student performance expectations.
3. **Lack of Student Engagement (Rank IV):** Design engaging and interactive content; provide personalized learning experiences based on learning styles. Offer incentives by allocating 10% of class marks for class discussions and forums to encourage sharing of examples or opinions.
4. **Increased Workload for Teachers (Rank X):** Develop a dedicated support mechanism for seamless digital and online teaching. Train teachers accordingly to ease the workload.
5. **Non-Availability of Proper Assessment Tools (Rank VI):** Standardize common templates for online assessments to enable transparency, especially for future re-evaluations.
6. **Difficulty in Assessing Student Understanding (Rank VIII):** Encourage theory-based assignments to assess understanding. Motivate students to use available reports or research articles online to support assignment submissions, enabling better assessment of comprehension.
7. **Students' Hesitation to Interact (Rank III):** Create a safe and inclusive online environment. Use interactive teaching methods to foster student participation.
8. **Limited Face-to-Face Interaction (Rank VII):** For online classes lasting between 3 to 6 months, mandate 7 to 10 days of on-campus classes to allow for face-to-face interaction.
9. **Need for Constant Adaptation but No Time to Self-Learn (Rank IX):** Deputize faculty for training programs focused on digital tools. Incorporate hybrid teaching methods into the curriculum to ease the transition process.
10. **Teachers' Spending More Time on Assignments**

(Rank V): Standardize templates for commonly used assignments across disciplines to reduce repetitive work and improve efficiency.

Summary of Constraints Faced by Students

Students also faced numerous barriers in adapting to online learning environments, many of which were deeply interconnected with socioeconomic and infrastructural challenges. The most prominent constraint was the *lack of access to proper digital devices*, with many students forced to share devices with siblings or use outdated equipment unsuited for online learning. *Poor internet connectivity* ranked as the second most significant constraint, particularly in rural areas where stable internet is scarce. Many students also reported *inadequate technical skills*, making it difficult to navigate learning platforms, submit assignments, or troubleshoot minor issues. The shift to online learning significantly reduced *student-teacher interaction*, depriving students of the timely guidance and personalized support available in traditional classrooms. Online assessments and examinations became another major source of stress due to unfamiliar formats, technical difficulties, and concerns about fairness. Furthermore, *lack of motivation for self-learning* emerged as a common challenge, with students struggling to stay focused without external structure and peer support. *Mental stress and cognitive fatigue* increased due to prolonged screen exposure, isolation, and the cognitive overload associated with digital learning environments. Additionally, students were exposed to numerous *distractions at home*, ranging from household noise to competing responsibilities, which further impeded their concentration. Many students also found the *non-interactive teaching methods* used in online classes unengaging, leaving them passive participants in their learning. Finally, *difficulty in understanding concepts* arose from the absence of hands-on activities, peer discussions, and immediate feedback, making complex topics harder to grasp.

Solutions for Addressing Student Constraints

1. **Poor Internet Connectivity (Rank II):** Universities could develop platforms capable of functioning effectively with low-bandwidth internet connections to ensure accessibility for students in rural or connectivity-challenged areas.
2. **Lack of Proper Digital Devices (Rank I):** Universities could identify socio-economically disadvantaged students and initiate sponsorship programs to provide them with the necessary digital devices for seamless participation in online learning.
3. **Difficulty in Understanding Concepts (Rank X):** Course videos could be kept brief (20 minutes or less) with the provision of transcripts to support comprehension, particularly addressing dialectal differences and language barriers.
4. **Limited Interaction with Teachers (Rank IV):** Universities could establish dedicated digital learning cells on campus to provide individualized academic support and facilitate virtual office hours where students can seek direct guidance from faculty.
5. **Lack of Motivation for Self-Learning (Rank VI):** Personalized learning experiences could be introduced to foster student motivation, with particular emphasis on supporting specially-abled students pursuing agricultural courses.
6. **Distractions at Home (Rank VIII):** Universities could mandate regular teacher-parent discussions to ensure parents understand academic expectations and the need for a conducive learning environment at home.
7. **Inadequate Technical Skills (Rank III):** Technology training could be integrated into the induction process for students joining B.Sc. (Hons.) Agriculture programs, along with clear articulation of performance expectations related to digital learning.
8. **Assessment and Exam-Related Stress (Rank VII):** Standardized templates for online assessments could be introduced to enhance transparency and reduce uncertainty, ensuring fair evaluation processes and reducing assessment-related stress.
9. **Non-Interactive Learning Methods (Reduced Attention Span) (Rank IX):** Interactive and engaging content could be designed to cater to various learning styles. Additionally, incentives such as allocating 10% of class marks for participation in online discussions or forums could encourage active engagement.
10. **Mental Stress and Cognitive Fatigue (Rank V):** Universities could appoint psychology consultants or counsellors to offer professional support to students, helping them manage stress, maintain mental well-being, and develop coping strategies.

Concluding Remarks: The transition to online education in agricultural courses highlighted several challenges for both teachers and students. Teachers faced technical difficulties, digital incomprehensibility, increased workloads, and limited means to assess student understanding effectively. Simultaneously, students grappled with poor internet connectivity, lack of proper devices, limited teacher interaction, low self-motivation, and cognitive fatigue. These constraints collectively affected teaching efficiency and learning outcomes.

To overcome these barriers, institutions must invest in robust infrastructure, provide regular technical and pedagogical training, establish standardized assessment tools, and foster interactive learning environments. Personalized learning experiences, virtual office hours, and better student-teacher engagement can enhance student involvement. Additionally, psychological support, parental sensitization, and hybrid teaching models would create a more inclusive and adaptive system.

By addressing these issues holistically, agricultural education can evolve into a more resilient, student-centered system that balances technology with human connection, ensuring both learning continuity and quality.

Conflict of interest: Authors doesn't have any conflict of interest.

Funding: The study is funded by ICSSR, New Delhi.

Acknowledgements: My heartfelt gratitude to all the teacher and student respondents who took their invaluable time in recording their experiences and were available to me, when I needed clarifications. I specially thank Associate

deans of all the agricultural colleges, for facilitating the data collection.

References

1. Ahammad F. Online learning initiatives and its effects on teaching learning process during the covid-19 pandemic. The Online Journal of Distance Education and e-Learning. 2021;9(1):144-155.
2. Almaiah MA, Al-Khasawneh A, Althunibat A. Exploring the critical challenges and factors influencing the E-learning system usage during COVID-19 pandemic. Educ. Inf. Technol. 2020. https://doi.org/10.1007/s10639-020-10219
3. Amita. e-learning experience of students in higher education institutions during the covid 19 pandemic: a primary survey. COVID-19 Pandemic: A Global Challenge. New Delhi: Aryan Publications; c2020. p. 115-131.
4. Bao W. COVID-19 and online teaching in higher education: A case study of Peking University. Human Behavior and Emerging Technologies. 2020;2(2):113-115.
5. Bozkurt A, Sharma RC. Emergency remote teaching in a time of global crisis due to CoronaVirus pandemic. Asian Journal of Distance Education. 2020;15(1):1-6.
6. Dhawan S. Online learning: A panacea in the time of COVID-19 crisis. Journal of Educational Technology Systems. 2020;49(1):5-22.
7. Dhivya N, Rajasekaran R. An opinion study about online learning method conducted during COVID-19 pandemic among agricultural students. J. Agric. Sci. 2021;55(3):36-43.
8. Garrison DR, Vaughan ND. Blended learning in higher education: Framework, principles, and guidelines. Hoboken (NJ): John Wiley & Sons; c2008.
9. Gautam P. Advantages and disadvantages of online learning. elearningindustry.com. 2020 [cited 2025 Mar 8]. Available from: https://elearningindustry.com/advantages-and-disadvantages-online-learning
10. Haider AS, Al-Salman S. Dataset of Jordanian university students' psychological health impacted by using e-learning tools during COVID-19. Data Br. 2020;32:106104.
11. Haron HN, Masrom M, Yaacob S, Sabri SA. The challenges and constraints of online teaching and learning in the new normal environment. Int. J Acad. Res. Bus. Soc. Sci. 2021;11(4):1284-1295.
12. Hasan N, Khan NH. Online teaching-learning during COVID-19 pandemic: Students' perspectives. TOJDEL. 2020;8(4):202-213.
13. Hodges C, Moore S, Lockee B, Trust T, Bond A. The difference between emergency remote teaching and online learning. Educause Review. 2020;27(1):1-12.
14. Muthuprasad T, Aiswarya S, Aditya KS, Jha GK. Students' perception and preference for online education in India during COVID -19 pandemic. Soc. Sci. Humanit. Open. 2021;3(1):100101.
15. Naik GL, Deshpande M, Shivananda DC, Ajey CP, Manjunath Patel GC. Online teaching and learning of higher education in India during COVID-19 emergency lockdown. Pedagogical Research. 2021, 6(1).
16. World Bank. Remote Learning, EdTech & COVID-19. World Bank Education Global Practice. 2020.