The Impact of Covid 19 in the Teaching of Agricultural Science in Senior Secondary Schools- A Case Study in Makeni, Northeastern Sierra Leone

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***Abstract*—** *The COVID-19 pandemic has had an impact on senior secondary education in the agricultural sector in Makeni town in particular and Sierra Leone in general. There are issues with motivation, communication, and learning that affect both teachers and students. The main problems in Sierra Leone are the insufficient availability of energy, especially in rural regions, and the limited access to the internet. Before and after the COVID-19 outbreak, agricultural students and instructors experienced a variety of difficulties when learning and teaching online. In this article, possibilities and methods for enhancing online teaching and learning in the agricultural higher education of underdeveloped nations like Sierra Leone are also covered.*

I. INTRODUCTION

The COVID-19 outbreak has become a major global problem that has impacted practically everyone. Due to the worldwide closure of face-to-face education in universities and schools during the COVID-19 era, education and learning have been severely affected. The 'applied' fields of science and education have been particularly impacted more by the absence of face-to-face instruction. The "agricultural sciences" are a prime illustration of it. The theoretical component of agricultural sciences is taught in classrooms.

And the practical use in a lab or a field of agriculture quickly follows the theoretical portion. The bad aspect of this narrative is that distant learning eliminates the possibility of teaching both theory and practice of the same subject. In the end, neither the faculty members' "course objectives," which include "learning goals; each course has its certain aims/goals," nor the students' "course objectives" can be achieved in their true sense.

This detrimental effect has been seen in industrialized nations like the United States of America, England, and others as well as in developing or semi-developed nations like Sierra Leone, Guinea, Liberia, and Monrovia. According to a recent World Bank assessment of the COVID-19 epidemic's effects on education, particularly in nations like Sierra Leone, most students will face considerable difficulties transitioning to and pursuing online education because of a variety of internet access and other impediments (World Bank, 2020).

II. CHALLENGES

eLearning is a great opportunity for several industries, but there are a number of issues, primarily affecting children, in the senior secondary school education sector. The majority or all of Sierra Leone's colleges have inadequate information technology (IT) infrastructure, and most of the time, students only have limited access. Teachers use these online platforms to give advice, assign homework, and other things. It should be noted that students in agricultural science departments come from both rural and urban areas, as well as from remote locations where internet access is sometimes not possible at all due to poor network coverage or is restricted due to poor network coverage.

Additionally, the internet's speed is really poor and insufficient for online lessons. For instance, in Makeni Town, the senior secondary school (SSS) Education Commission (HEC) brought attention to the internet problem that students were experiencing, and the minister of technical and higher education ordered all senior secondary schools in Makeni Town specifically and Sierra Leone generally to accommodate students from the remote areas in the university hostels, at least during online exams, in order to ensure the success of exams (Zahra et al., 2020).

In underdeveloped nations, inadequate connectivity, a lack of technical know-how, and access to a laptop or computer due to cost are the main issues with the internet. Pupils from countries with developed infrastructure are also affected by these internet hurdles, in addition to rural students from nations like Pakistan, Oman, and Turkey (Boerngen & Rickard, 2021; Naiketal.,2021).

Management of learning Most secondary schools and universities in Makeni Town specifically and Sierra Leone generally have embraced the learning management system (LMS) as a tool for online teaching and learning with the adoption of COVID-19. However, the learning management system (LMS) was only briefly or not at all introduced to the students and teachers, which had a significant impact on the system's efficacy. Additionally, the majority of Makeni town's senior secondary schools and universities' LMS systems were unable to handle the load of the many students, resulting in frequent website crashes and lost connections.

As a result, the LMS continues to serve only as a source for student registration and the distribution of study materials to the students due to the poor internet infrastructure in the majority of distant areas. Due to this, the teachers were obliged to use social media platforms, some of which operated at a slower internet speed (Khan, 2021). For the purpose of providing the lectures to the students, the teachers used to

distribute recorded lectures on WhatsApp and conducted live sessions with the students on Zoom and Google Meet.

III. POOR LEARNING AND TEACHING

Adnan and Anwar (2020) conducted a survey of higher education students from various disciplines and found that, despite the fact that 90% of the students were proficient computer users (and 10% even couldn't use the internet properly), 99% of the respondents believed that in-person instruction is necessary for proper understanding and 50% believed that online instruction cannot produce effective learning. Digital injustices between students and instructors were suddenly made public because many locations lacked internet access. The method is less effective since students, professors, and lecturers did not receive enough prior training on the requirements of online learning (Oyedotun, 2020). Teachers, like students, encountered issues with online communication in addition to studying.

IV. PRACTICAL LEARNING

Poor network infrastructure, a lack of technological confidence and experience, a lack of cooperation in the classroom and low attendance during online lectures remained the most issues that teachers had to deal with (Noor et al., 2020). Ineffective teaching or learning undermines the effectiveness of education, which is a two-way process. Both parties had limits while dealing with the aforementioned issues. The standards of physical education could not be met by an online lecture, particularly in agriculture where physical practical instruction is required.

Due to their lack of prior agricultural knowledge and inability to comprehend even the fundamentals of an online course, the issue for the new admissions became urgent. Contrarily, it was shown that students with poor communication skills engaged in social media learning more frequently than they did in traditional classroom settings (Khan, 2021).

V. STUDENT ASSESSMENTS

Due to the lack of internet access, some students from remote locations still failed to turn in their assignments and written exam sheets by the deadline. Poor student evaluation in the exam as a result of open-book exams and limited internet connection presents another difficulty. Multiple-choice questions are frequently used by lecturers and tutors to evaluate pupils because there is no monitoring system in place (Oyedotun,2020).

VI. POOR PERFORMANCE OF TEACHERS AND GRADUATES, LESS MARKET VALUE

Many students were required to work at home due to the online delivery method, where they were exposed to a variety of household distractions and issues (Sutton, 2020); as a result, the majority of students found it challenging to focus when learning online. These issues with inadequate learning could lead to unemployment for COVID-19 students since they would be unable to compete with those who had attended physical coursework and participated in physical practical

labor. Finding solutions to this problem or other such regrettable circumstances in the future is therefore urgently needed.

Some students have always resisted change and do not want to adjust to the online learning environment; as a result, they require particular encouragement and help becoming accustomed to LMS and eLearning techniques.

Economic Hurdles:

Many students, particularly in developing nations like Sierra Leone where senior secondary school and university students occasionally lack the funds to pay the fee, are not given laptops or laptops with high specifications and a high-quality broadband or internet connection, which are the basic requirements of an online class, and as a result, students fall behind their virtual classmates. The fact that most students own cellphones but not laptops is another issue that frequently arises. It has also been noted that some students have fairly expensive smartphones, which can serve multiple purposes, but no computers, which makes learning challenging when utilizing a small screen in a virtual classroom. In addition, some students may not have access to telecom networks or have inadequate network coverage where they live, which prevents them from keeping up with the online course material.

VII. ONLINE LEARNING VS TRADITIONAL LEARNING

It is a difficult transition for students who are unfamiliar with online technology or digital learning resources to move from a traditional classroom and in-person instructor training to computer-based learning in a virtual classroom. For instance, in a typical classroom, live instruction and taking lecture notes are normal practices. However, online conversations and greater learning demand active participation or action, which makes online learning challenging for the students.

The majority of students can manage computers successfully because they have a good understanding of how to use new technology and learning tools, but many students struggle with laptops and other eLearning resources because they have never used them before. For instance, many students are unable to handle their files because they are unable to use simple programs like Microsoft Word, Excel, and PowerPoint. Furthermore, because they lack the necessary knowledge, many students find it difficult to resolve simple computer issues. However, technological competence is a must for taking online courses because it makes it possible for students to handle their assignments and coursework in an efficient manner.

Knowing precisely what kind of technical assistance they will require for a specific course and providing them with the necessary learning resources and equipment could be solutions to this issue. Additionally, foundational courses in computer literacy broaden students' expertise in the subject; being familiar with the basics of computer hardware would enable them to fully participate in online courses. Thus, since it has become a prerequisite, computer literacy classes may be introduced to pupils as early as the first grade. Future

generations will benefit from this and be better prepared to study through eLearning than the current generation, which has never been taught how to use a touchscreen, navigate a website, or even use a computer, which is a requirement for eLearning programs.

VIII. PROSPECTS AND STRATEGIES

As a teacher, this appears to be a nice opportunity, especially in terms of creating quality teaching lectures as opposed to classroom lectures while teaching online classes using Google Meet and Zoom apps. For instance, when students are enrolled in a class online and the teacher is unable to view the entire class owing to a small screen, the instructor must put in a lot of effort and time to construct the teaching so that the students can easily grasp the lecture.

When you have a defined class schedule and a set time to take a class in a set lecture room, it is not possible to alter the lecture scheduling to the convenience of the students and teachers. The flexibility of this eLearning in terms of time and location may draw more and more students to online learning. Additionally, this has created a chance for educational institutions with a shortage of teachers and classroom space.

Due to the practical nature of agriculture studies, COVID-19 demands a paradigm shift in the agricultural education system and a modification of the curriculum to better meet emerging needs. To decode the course material, students must be equipped with the necessary technical skills. The new learning environment must be accepted by students with an open mind and heart. This perspective might change if students had a greater awareness of the advantages of online learning and even talked about them with their peers.

Last but not least, eLearning necessitates self-motivation, which adult online learners in particular lack. Students must discover the drive to adopt new pedagogical practices and adequately prepare for upcoming challenges in their academic and professional lives (McKim et al., 2021). The only thing that will enable students to succeed in eLearning is a positive outlook. Students also need to be aware that eLearning can save them a lot of time because they won't have to travel and spend money on travel. By saving time and money, they can utilize those resources to practice hard and profit from eLearning.

For remote education, it is also necessary to use contemporary learning strategies, particularly those based online. Despite being a part of the agriculture curriculum, IT courses are insufficient to prepare students for eLearning. The efficiency of online education could be improved by adding new subjects geared for eLearning. Although students do not have prior knowledge of the subject until they are enrolled in it, agricultural education is an important and competitive industry. As a result, integrating this subject in school curricula may have a favorable effect on the students who choose to pursue it in higher education.

It is crucial that educators receive internet communication training. Radio and television should be used for online communication instead of just the internet. In Makeni Town in particular and Sierra Leone in general, agricultural schools and colleges may create their own FM radio or television channel, where they can record instruction and lectures and let students know when they are being given.

To meet market demands, Makeni town's agricultural school pupils and university graduates must be technically competent. When compared to the university farm's restricted field experience, students' practical work may be even more technically sound if private farms are included, especially during COVID-19-type outbreaks. Additionally, in bigger private farms, students can maintain social distance in the open air, allowing them to learn without breaking the government's COVID-19 SOPs.

Home-based practical activities, which may also be part of the curriculum, offer another option to private farms for motivating students even when they are not on campus. Since students are not physically there and the instructor cannot force them to listen to the entire lesson, motivation is the most crucial factor in online learning.

Students will learn more quickly if they are driven, either by the course's objectives or the instructor's piqued interest in it. Although practical sessions may be held on private farms, those students who do not have easy access to those farms might substitute some online instructions in the form of quick videos, which they can readily download even with slow internet. access.

IX. RECOMMENDATIONS

It is recommended that:

At agricultural HEIs, there is a demand for the general improvement of online resources as well as the competitiveness of (the LMS) learning management systems

To handle these kinds of problems, advanced learning management systems like Moodle or Writing Board should be introduced.

The standard curriculum should incorporate courses on eLearning techniques Universities that specialize in agriculture should have easier access to the technology that they used to teach their staff.

The importance of practical sessions cannot be understated; they may be scheduled on some private farms; however, as the majority of students would not have access to such facilities, they may be substituted with some video lessons.

It is necessary to narrow the high-speed internet access gap between rural and urban areas, and policies should be created to offer comparable internet services in both areas.

In order to prevent limited financial resources from becoming a barrier to students' participation in online learning, particularly in developing nations like Sierra Leone, internet packages to search and download the necessary course material should be provided to students at no cost or at very little cost.

X. CONCLUSION

Since practical experience and fieldwork are an essential component of curricula, eLearning cannot fully satisfy the objectives of higher education in the sector of agriculture. Communication, learning, and motivation issues affect both students and teachers, particularly as a result of internet issues. Furthermore, learning across rural and urban regions was

impacted by disparate access to high-speed internet. Even with restricted internet access, social media has become an excellent tool for communication and learning, but it has some limitations when it comes to student evaluation.

It may be preferable to implement more sophisticated learning management systems like Moodle or Writing Board, however for this purpose, internet connectivity could be enhanced. To deal with these kinds of circumstances, the standard curriculum could include courses on eLearning techniques. Therefore, there is a need for agricultural HEIs to increase their LMS' competitiveness as well as the overall quality of their online resources. The technologies that agriculture institutions use to teach skilled human resources must be improved (Kumar & Kumar, 2014).

Practical sessions should not be overlooked and should be scheduled on private farms; however, as the majority of students do not have access to these farms, these sessions should be substituted with video lessons. It is necessary to narrow the high-speed internet access gap between rural and urban areas, and policies should be created to offer comparable internet services in both areas. Additionally, internet packages that allow students to search and download the necessary course materials could be provided to them for free or at a very low cost so that their limited financial resources wouldn't be a barrier to their participation in online learning, especially in developing nations like Sierra Leone.

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