The Andhra Agric. J 71 (4): 456-460, 2024
doi :10.61657/aaj.2024.161

Smartphones in agricultural education: utilization, impact and learning outcomes

T Sreenivasa Rao
Acharya N G Ranga Agricultural University,
Agricultural College, Bapatla-522101, Andhra Pradesh, India

ABSTRACT

This paper examines the utilization and impact of smartphones on students' learning activities within the context of agriculture education. Smartphones have transformed agricultural education by offering immediate access to information, engaging learning experiences, and avenues for cooperation. The research investigates the frequency of smartphone utilization among agricultural students and evaluates its effect on academic performance. It examines the variety of agricultural educational applications and materials accessible on smartphones, emphasizing their efficacy in improving agricultural education. The study recognizes potential obstacles such as diversions, reliance on technology, and data privacy issues. The paper presents rules for appropriate smartphone usage and offers recommendations for future advancements in smartphone-based agriculture education. This research, based on surveys and observational studies, investigates how smartphones enhance learning for educational purposes, the problems they provide, and their overall impact on student engagement and academic achievement, with 92% of participants use them for this reason.

Keywords: *Agricultural education, Learning activities, Students and Smartphones*

In the 21st century, smartphones have become essential to our lives, revolutionizing communication, employment, and education. As smartphones become more accessible and affordable, students have embraced these gadgets as effective instruments to enhance their educational experiences. Smartphones have revolutionized agricultural education by enabling students to access extensive information, engage with industry professionals, and deepen their comprehension of agricultural principles. Smartphones have become an essential instrument in students' lives, significantly influencing their learning experiences. In the realm of agricultural education, smartphones have provided novel options for interactive and engaging learning. The use of cell phones into students' educational activities has resulted in significant transformations in agriculture education. These gadgets provide immediate access to knowledge, enable collaborative learning, and deliver experiential learning through multimedia forms and data collection. Although smartphones offer benefits in education, it is crucial to maintain equilibrium and promote appropriate usage to mitigate distractions and any disadvantages. As technology progresses, educators and students must recognize smartphones as essential instruments that augment agricultural knowledge and foster sustainable practices in contemporary farming.

Smartphone Integration in Agricultural Education

Agricultural education has seen significant technological advancements, and the integration of smartphones has played a pivotal role in shaping the learning landscape. With the widespread availability of smartphones, students now have instant access (Figure 1) to a vast array of information, resources, and educational applications that enrich their learning experiences

Access to Agricultural Information

Smartphones have revolutionized information access in agriculture. Students can now quickly access online agricultural databases, research papers, and market trends. By leveraging mobile applications, they can gain insights into crop management, pest control, and other agricultural practices, allowing them to make informed decisions and stay up-to-date with the latest developments in the field.

Interactive Learning through Apps

Agricultural education apps offer interactive learning experiences that go beyond traditional text-

books. These apps incorporate simulations, and virtual reality, allowing students to experience real-life scenarios and practice problem-solving skills in a risk-free environment. Through these engaging activities, students can develop a deeper understanding of agricultural concepts and practices.

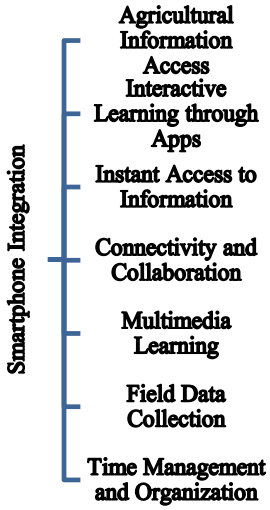

Figure 1: Integration of Smartphone Utilization of information activities

Instant Access to Information

One of the most significant benefits of smartphones in agricultural education is their ability to provide instant access to vast amounts of information. Students can quickly search for topics related to agriculture, including crop cultivation techniques, pest management, and sustainable farming practices. This real-time access to knowledge empowers students to expand their understanding and stay up-to-date with the latest advancements in the agricultural sector.

Connectivity and Collaboration

Smartphones enable seamless connectivity and collaboration among students, educators, and industry professionals. Social media platforms and communication apps facilitate networking opportunities, allowing students to join agricultural forums, participate in online discussions, and connect with experts from around the world. This interconnectedness fosters a sense of community and helps students build valuable relationships that may lead to internships or employment opportunities in the agricultural sector.

Multimedia Learning

Smartphones allow students to learn through multimedia formats, such as videos, podcasts, and interactive presentations. Agricultural education can be enhanced through visual aids that demonstrate practical farming techniques, showcase successful case studies, and provide virtual farm tours. This multimodal learning experience caters to diverse learning styles and enhances retention and understanding.

Field Data Collection

Agricultural education often involves fieldwork and data collection. Smartphones equipped with sensors and GPS capabilities enable students to collect real-time data on soil conditions, weather patterns, and crop growth. This hands-on experience enhances their observational skills, critical thinking, and analytical abilities. Moreover, the data collected can be analyzed using various agricultural software, turning students into more data-driven decision-makers.

Time Management and Organization

Smartphones offer a range of productivity apps that help students manage their time efficiently. From setting reminders for assignments and exams to creating study schedules, these tools foster better organization and time management. Students can balance their academic commitments with extracurricular activities, contributing to a well-rounded educational experience.

Literature Review

Recent studies have explored the impact of smartphones on agricultural education and student learning. While Smith et al., 2019 found no significant differences in motivation between smartphone-using and non-using groups in agricultural education, H. E. Smith et al., (2018) reported no negative effects on academic achievement when using smartphones for tree identification. Darko-Adjei (2019) Darko-Adjei, (2019)observed that distance learning students found smartphones easy to use and beneficial for academic activities, despite some challenges like unstable internet and screen size limitations. Firmansyah et al., (2020) concluded that smartphones are significantly useful in student-centered learning across various disciplines and education levels. These studies suggest that smartphones can be effectively integrated into agricultural education without compromising student performance or motivation. However, more research is needed to fully understand the long-term effects and potential benefits of smartphone use in educational settings (H. E. Smith et al., 2018; Darko-Adjei, 2019).

Objective

The study aims to determine the prevalence of smartphone usage among students in agricultural education programs. This objective will help identify the level of smartphone integration in the learning process.

MATERIAL AND METHODS

This study involved a survey of library users at NG Ranga Agricultural University regarding the utilization of smartphones for agricultural learning information. A structured questionnaire comprising 100 was distributed, and 83 responses were received, indicating a response rate of 83%. The findings are illustrated in Figure 2, which combines quantitative surveys with qualitative observational studies. Alongside the survey, observational research was performed in classroom and fieldwork environments to evaluate the practical application of smartphones in real-time learning activities. The observation concentrated on the categories of work executed via smartphones, the frequency of usage, and the degree of student participation.

RESULTS AND DISCUSSIONS

This survey results shows that figure 3 displayed usages of information through smartphone in daily activities of agricultural learning Figure 3 is a horizontal bar chart illustrating smartphone usage patterns among males and females across different activities.

The assessed activities comprise

Time Management and Organization: Males reported a usage rate of 39%, whilst females exhibited a marginally elevated usage rate of 44%. Field Data Collection: Both genders exhibit comparable utilization, with males at 41% and females at 42%. Multimedia Learning: The usage is relatively equal, with males at 41% and females at 42%. Connectivity and Collaboration: A considerable disparity is evident, with females exhibiting a 48% utilization rate, markedly surpassing males at 35%. Immediate Access to Information: Males exhibit a greater utilization rate at 47%, whereas females demonstrate 36%. Interactive Learning via Applications: Females exhibit more usage (45%) than males (38%). Access to Agricultural Information: Males exhibit a marginally higher usage rate at 42%, in contrast to 41% for females.

The chart illustrates notable gender-based disparities in smartphone utilization across diverse educational and organizational tasks. In Time Management and Organization, Field Data Collection, and Multimedia Learning, both sexes exhibit comparable utilization. In domains such as Connectivity and Collaboration and Interactive Learning via Applications, females exhibit markedly greater engagement than males, indicating that women may utilize cellphones more for collaborative and interactive functions. This may indicate varying learning preferences or methodologies between genders, with females potentially favoring more social or application-based learning techniques. Conversely, males exhibit greater utilization of Instant Access to Information and Access to Agricultural Information, suggesting a propensity to employ smartphones predominantly for rapid information retrieval, particularly in agricultural contexts or urgent problem resolution. These findings indicate overarching trends in digital literacy and mobile utilization within educational and professional contexts. The increased participation of females in collaborative and interactive activities indicates that educational applications or platforms emphasizing these aspects could more successfully engage female users. Simultaneously, the increased utilization by males for rapid information access underscores their demand for efficient and direct information retrieval methods, especially in technical or field-specific jobs. Comprehending these patterns can facilitate the creation of more gender-responsive educational tools and applications that address the distinct ways in which men and women interact with technology. Furthermore, these insights may prove beneficial for industries such as agriculture, education, or vocational training, where mobile utilization is essential. Future research should investigate the underlying causes for these disparities, including cultural, societal, or occupational aspects that may affect how various women interact with technology in their educational experiences.

CONCLUSION

The data in the figure highlights notable gender differences in smartphone usage across various educational and organizational activities. While some activities like Field Data Collection and Multimedia Learning show similar usage between males and

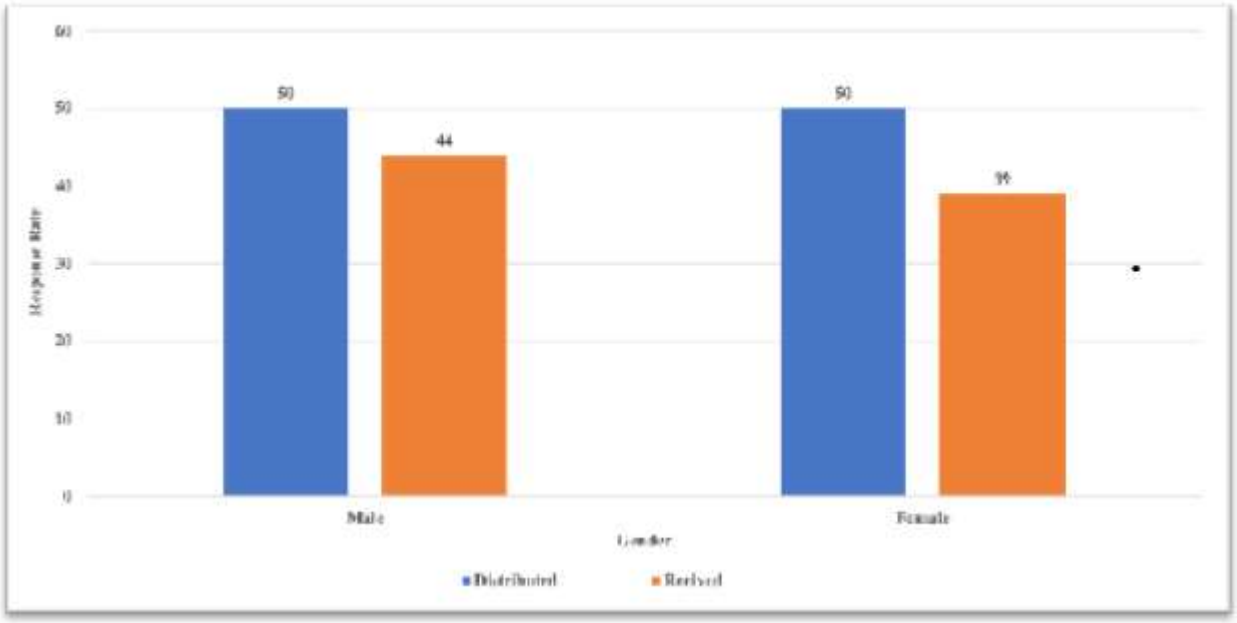

Figure 2. Sample Size

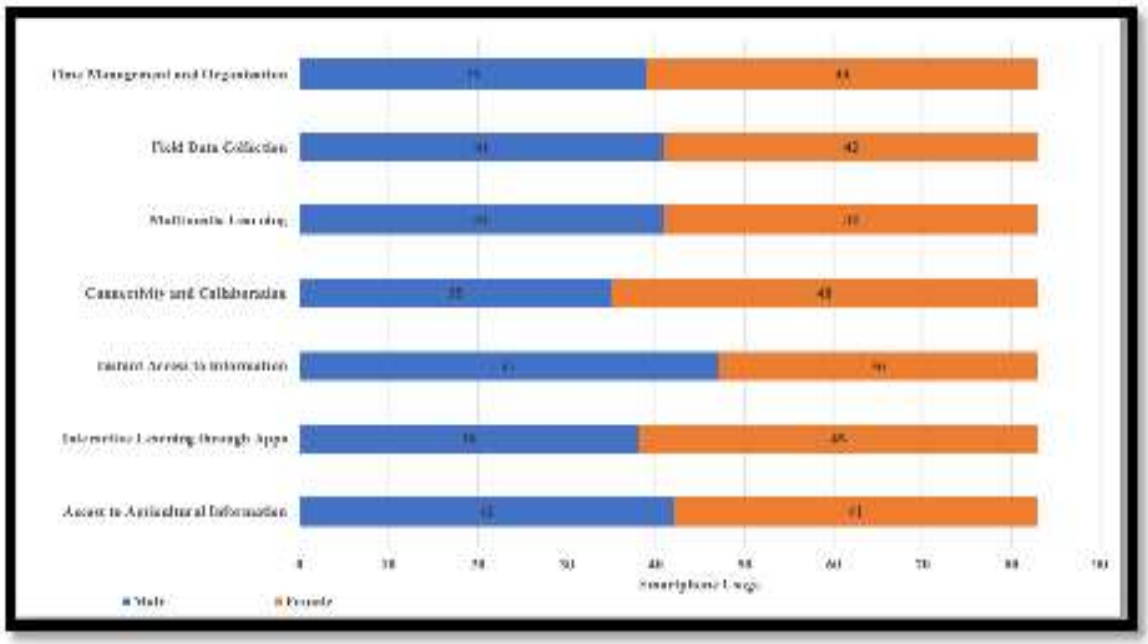

Figure 3. Usages of Information through Smartphone

females, significant disparities exist in areas like Connectivity and Collaboration (where females dominate) and Instant Access to Information (where males lead). These differences suggest that men and women may approach learning and technology use in distinct ways, with females favoring collaborative and interactive methods and males focusing more on direct information retrieval. Understanding these patterns can help in the design of more tailored educational tools and mobile applications that cater to the specific preferences of each gender. It also underlines the importance of developing gender-responsive digital strategies, especially in fields such as education, agriculture, and professional training, where smartphones are becoming essential tools.

LITERATURE CITED

Darko-Adjei N 2019. The use and effect of smartphones in students' learning activities: Evidence from the University of Ghana,

Legon. *Library Philosophy and Practice (e-Journal)*. https://digitalcommons.unl.edu/libphilprac/2851

Firmansyah R O, Hamdani R A A and Kuswardhana D 2020. The use of smartphone on learning activities: Systematic review. *IOP Conference Series: Materials Science and Engineering*, *850*(1), 012006. https://doi.org/10.1088/1757-899X/850/1/012006

Smith E, Blackburn J J, Stair K and Burnett M 2019. Determining the effects of the smartphone as a learning tool on the motivation of school-based agricultural education students in Louisiana. *Journal of Agricultural Education*. https://doi.org/10.5032//jae.2019.03141

Smith H E, Blackburn J J, Stair K S and Burnett M F 2018. Assessing the Effects of the Smartphone as a Learning Tool on the Academic Achievement of School-Based Agricultural Education Students in Louisiana. *Journal of Agricultural Education*, *59*(4), 270–285.https://doi.org/10.5032/jae.2018.04270

Received on 22.11.2024 and Accepted on 17.12.2024