

Evaluating the Impact of AI-Based Learning Tools on the Academic Performance of Agriculture Students in the Negros Island Region, Philippines

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Abstract

This study focuses on how AI based learning tools effects on the academic performance of the students mostly in the Negros Island Region, Philippines now a days. AI has grown so fast and has had big impact on society, especially on the students in terms of their source for their learning materials. By using AI platforms students will not start from scratch to do their respective class work. The main goal for this study is to find out how accurate AI based learning tools now a days knowing also that using this platform has pros and cons. The survey shows that there are problems, such as not being able to get online easily, having trouble with some AI tools, worrying about how accurate AI-generated information is, and maybe relying too much on AI. In general, the results show that AI-based learning technologies can help students in agriculture learn if they are used correctly. The study shows that it is important to teach people how to use AI, get help from experts, follow ethical rules for using AI, improve digital infrastructure, and be careful when using AI in agricultural education. There were terms in agricultural which are too general or not suitable to the said topics AI sometimes uses unclear terms.

Keywords: *Artificial Intelligence; AI-based learning tools; academic performance; agriculture students; educational technology.*

1. Introduction

In today's world, technology continues to rapidly change the way people live, work, and learn. In education, digital tools are now widely used to support teaching and improve students' learning experiences. One of the most recent developments is Artificial Intelligence (AI), which is being integrated into classrooms to provide more interactive, personalized, and efficient learning (Zawacki-Richter et al., 2019).

AI-based learning tools are becoming popular in higher education because they can help students better understand lessons, stay engaged, and improve their academic performance. Studies show that AI can support students by giving instant feedback, assisting with difficult topics, and improving study habits (Pacheco-Mendoza et al., 2023; Bećirović et al., 2025). However, while these tools offer many benefits, it is still important to evaluate how effective they are in real classroom settings.

In the field of agricultural education, students are expected to learn both theoretical concepts and practical skills. This makes it important to use innovative tools that can support different types of learning. In regions like the Negros Island Region, where agriculture plays an important role in the economy, improving the academic performance of agriculture students is essential for future development.

Therefore, this study aims to evaluate the effectiveness of AI-based learning tools on the academic performance of agriculture students at a university in the Negros Island Region. To evaluate the effectiveness of AI-based learning tools on the academic performance of agriculture students at Negros Island Region, Philippines. Specifically, it aims to achieve the following objectives: 1.) Determine the level of use of AI-based learning tools among agriculture students. 2.) Assess the academic performance of agriculture students using AI-based learning tools. 3.) Examine the relationship between the use of AI-based learning tools and students' academic performance. 4.) Identify the perceived benefits of AI-based learning tools in improving students' understanding of agricultural

concepts. 5.) Determine the challenges encountered by students in using AI-based learning tools. 6.) Propose recommendations based on the findings of the study.

3. Review of Related Literature

The Use of AI-Based Learning Tools in Education

AI-driven learning tools are increasingly important in contemporary education as they offer students real-time support, personalized explanations, feedback, and out-of-class support. This includes chatbots, intelligent tutoring systems, grammar and writing tools, automated assessment tools, and generative AI tools such as ChatGPT, Gemini and others. Zawacki-Richter et al. (2019) noted that in higher education, artificial intelligence is used in the fields of student support, intelligent tutoring, adaptive learning, assessment and student profiling. In their systematic review, they highlighted the potential of AI to assist teaching and learning by making the educational process more adaptable, individualized, and personalized.

Recently, there has been a growing interest in generative AI tools that can generate explanations, summaries, examples and texts that can help students with their academic work. Chan and Hu (2023) reported university students generally have positive attitudes towards generative AI in higher education. They found that students acknowledge AI tools can assist them in learning, especially for brainstorming, increasing productivity, facilitating writing, and clarifying concepts. But they also indicated a need for students to be taught the ethical use of AI.

Likewise, Kasneci et al. (2023) described how large language models can offer numerous educational benefits, such as individual learning support, language help, content generation and formative assessment. These tools can help students understand, organize and explain concepts, and grasp complex lessons. But they also noted that the responses generated by AI could contain errors, biases or incorrect information, so students should not blindly trust AI responses.

How AI-Driven Learning tools Support Academic Performance

Several studies indicate that AI-powered learning tools might impact students' academic performance by aiding comprehension, enhancing learning, and improving efficiency in academic tasks. AI-based software can assist students in revising lessons, creating quizzes, summarizing text, and offering explanations. These features may assist students to study more efficiently and meet academic demands.

A recent paper examining the impact of AI technologies on students' learning and academic performance identified that the use of AI can affect students' learning, task performance and their perception of success. The research highlighted the potential of AI tools to enhance learning efficiency but noted that the impact of AI on student academic performance is dependent on student use and critical application of information generated through AI.

In this regard, recent systematic reviews have demonstrated that AI can enhance academic performance when integrated into the learning process. Academic success could be improved by AI tools through personalized learning, feedback and support. But the link between using AI and academic performance is not always straightforward.

Learning outcomes are affected by students' effort, motivation, knowledge of the subject matter, learning approaches and the ethical use of technology.

This suggests AI learning tools should be looked at as an academic support tool rather than a substitute for learning. AI can help students' complete tasks and learn lessons, but academic achievement still comes from thinking critically, engaging and mastering concepts.

Students' Perception of the Benefits of AI-Based Tools

A key advantage of AI-based learning tools is that they can offer timely and convenient academic support. AI tools can be used by students to ask questions, explain complex lessons, provide examples, and give feedback. This is especially useful for students who may require additional support outside of class time.

According to Chan and Hu (2023), students see generative AI as a boon because it enables them to learn faster, boosts their productivity and helps them with academic writing and idea generation. Students also perceived AI tools to be helpful for summarizing information and helping them with schoolwork.

Another significant advantage is personalized learning. AI tools can respond according to the student's question and needs. Students can ask AI to simplify concepts, give examples, or compare concepts. Zawacki-Richter et al. (2019) observed that AI tools in the tertiary education sector tend to be adaptive learning and support systems, so AI can accommodate various learning styles and levels of knowledge.

AI also has the potential to boost students' learning confidence. AI can help students overcome their fear of failure and motivate them to tackle complex topics through its instant feedback and explanations. But confidence may only increase if students are able to verify information generated by AI and apply it as a source of learning rather than an answer.

AI, Critical Thinking and Self-Learning

While the use of AI tools offers numerous advantages for learning, its impact on critical thinking is of particular concern. Critical thinking can be enhanced by using AI to compare perspectives, assess explanations, generate questions, and check information. But it can also undermine critical thinking when students accept AI responses without critically engaging them.

Kasneci et al. (2023) noted that students need to be taught how to critically assess AI-generated responses as large language models can provide wrong or flawed answers. So, using AI should prompt students to reflect, validate and refine AI-generated responses.

Recent research on students' use of generative AI also emphasizes AI literacy. Students need to know how to craft prompts, evaluate the quality of AI-generated responses, avoid plagiarism and uphold ethical standards in their academic practices. If not taught, students might rely solely on AI tools and neglect to learn critical thinking and problem-solving skills.

Challenges in Using AI-Based Learning Tools

While AI-based learning tools offer many benefits, there are also challenges. A key challenge is the veracity of AI information. AI can give unreliable, out-of-date, biased or even fictional information. This could be problematic for students who heavily depend on AI without consulting information from academic sources.

Chan and Hu (2023) discovered students are concerned about issues with generative AI, such as accuracy, plagiarism, ethical considerations and over-reliance. In their research, they stressed the need for students to receive support from their institutions to responsibly use AI tools.

There's also the concern of technological access. Many AI tools rely on digital devices and access to the internet, so students who lack access to these may not have access to AI-based learning support. Research on incorporating AI in

universities demonstrates that access, digital literacy and technological readiness play a key role in the effective integration of AI.

Risk of over-reliance is also a concern. Overdependent on AI writing assignments may diminish student engagement with reading, analysis and generating original ideas. This could impact learning, memory and integrity. In this regard, AI should be used to support students to learn but not replace their learning or effort.

Synthesis

This literature review indicates that the use of AI-based learning tools can aid students' learning. They can assist students to learn complex lessons, do assignments faster, get immediate feedback, and enhance learning support. This is aligned with the current study, which explores students' use of AI-based learning tools, their academic performance, perceived benefits and challenges.

But the literature also indicates that using AI does not necessarily improve academic performance. This is contingent on students' digital literacy, responsible use, access to technology, and skills to critically analyze the information generated by AI. So AI learning tools should be used in education with appropriate support, policies and training on how to use them responsibly.

In general, past research supports the notion that AI-based learning tools can be beneficial. But they also show that we need to pay attention to issues of misinformation, over-reliance, cheat, lack of digital literacy skills, and access to technology.

4. Methodology

4.1. Research Design

This study used a descriptive-survey design to evaluate how well AI-based learning tools work and help the agriculture students in Negros Island. This method is useful because introducing the effectiveness of using the AI-based platforms would really help all learners, not just in their school activities but they can apply this also in their daily lives' activities.

4.2. Participants/Respondents

The respondents of this study were the agriculture students enrolled at the designated university in Negros Island. To make sure the sample is representative, individuals from different year levels will be chosen using structure research made questionnaire method.

4.3. Tools/Instruments use

The primary instrument was used a structured questionnaire of closed-ended and Likert -scale questionnaire consisting of 4 parts. Part 1 Use of AI-Based Learning Tools, Part 2 Academic Performance, Part 3 Perceived Benefits and Part 4 Challenges Encountered. The instrument were undergo validation by research experts.

4.4. Data Collection Method

The data was collected through research made structured questionnaire distributed randomly through online to the respondents.

5. Results and Discussion

The study shows that the respondents are positive but cautious about their use of AI-based learning tools. For the statement "Frequently use AI-based tools for my academic tasks," most respondents answered Neutral (52.5%)

and Agree (36.1%). There were only a few who strongly agreed, disagreed or strongly disagreed. This suggests that many students may be familiar with AI-based tools, but not all students may use these tools frequently.

This suggests AI use may be in the early stages. Students seem to appreciate the benefits of AI tools, but their use may be related to access, familiarity, confidence, teacher support, and the tasks in which AI tools are used. These results are consistent with research on generative AI at the university level, in which students are generally aware and interested in the use of AI technologies, but differ in how they embed these tools in their learning and work. Chan and Hu (2023), for instance, reported that while higher education students generally have positive attitudes towards generative AI tools, they still need support to use them effectively and ethically.

For the statement "AI tools help me complete assignments more efficiently" 44.3% agreed and 8.2% strongly agreed, with 47.5% neutral. This indicates that just over 50% of participants thought that AI tools were useful to increase their assignment efficiency. The large number of neutral responses, though, indicates that some students may not yet feel that AI tools are helpful or may not see AI use as improving their academic performance.

This finding is consistent with the research that demonstrates AI tools can help students with explanations, categorization, summarization, and writing. Kasneci et al. (2023) highlighted that large language models can support learning by helping to generate content, provide feedback and support on demand but noted that these tools need to be used critically due to limitations such as information quality and potential over-reliance.

i. Use of AI-Based Learning Tools

The statement "I use AI tools to better understand difficult lessons" received more positive agreements: 50.8% agreed and 16.4% strongly agreed. This reveals 67.2% of the respondents find AI tools useful in understanding difficult lessons. This is one of the most positive results in Part 1. It implies that students may not only be using AI to get tasks done, but also to learn lessons, to explain complicated ideas, and to get lessons in a more digestible way.

This suggests that AI learning technologies can be used as support technologies. The use of artificial intelligence in education has been linked to adaptation, personalization and support to the learner. Zawacki-Richter et al. (2019), in their systematic review of the use of AI in higher education, reported AI is used for student support, intelligent tutoring and adaptive learning.

The statement "AI-based platforms are easy to use", 44.3% agreed, 21.3% strongly agreed and 29.5% were undecided. This suggests most respondents perceive AI platforms to be easy to use. This is a crucial element as students will be more likely to use technologies that are easy to understand, comfortable, and convenient. This suggests that the survey participants generally don't find AI platforms challenging to use, which may lead to further use in learning tasks.

In conclusion, Part 1 shows that students are neutral to strongly positive towards the use of AI for learning. The highest levels of agreement were in the use of AI to better comprehend difficult lessons and to consider AI platforms as user-friendly. But the high frequency of neutral responses suggests AI use is not yet optimized, and may need further orientation, training, and support to embed and maximize its use in learning activities.

ii. Academic Performance

Under the category of academic performance, we see that the respondents are more hesitant in saying that AI directly improves their academic performance. In response to the statement "AI tools help me improve my academic performance" 39.3% agreed, but only a small percentage strongly agreed, and 45.9% were neutral. This finding indicates that while students acknowledged potential academic benefits of AI tools, they are not sure whether these tools have a direct impact on their academic performance.

This is significant because while using AI can help students complete work, develop their understanding and provide them with feedback, this does not necessarily translate to improved academic performance. There are numerous factors that impact academic performance, such as learning strategies, domain knowledge, teacher evaluation, motivation, time management, and ethical technology use. A recent systematic review of the literature found that the use of AI may help students with their academic performance, but the effectiveness is dependent on how well AI is implemented, the readiness of the students and the learning environment (Adewale et al. 2024).

For the statement, "I get better grades if I use AI tools", 59% of the respondents chose Neutral, 16.4% agreed, 19.7% disagreed, and a small percentage strongly agreed. This is one of the most neutral survey responses. This suggests the majority do not strongly link using AI tools with improved grades. Agreement was outnumbered by disagreement, suggesting that some students may use AI tools but don't necessarily equate them with higher grades.

This suggests students may separate academic support from academic success. Students can use AI tools to explain concepts or organize assignments, but ultimately grades are still based on understanding, application and evaluation of information. This agrees with Kasneci et al. (2023), who noted that educational applications of large language models need to incorporate critical evaluation because AI generated information can be incomplete, biased and inaccurate.

The statement, "AI tools help me study more effectively," had 42.6% agreeing and 45.9% neutral. This indicates that many believe AI is useful for enhancing study effectiveness, but almost half are neutral. Students can use AI to assist with summarizing lessons, examples, practice questions, and making information more digestible and accessible. But the large number of neutrals may suggest that some students may not have yet found the best way to use AI as a study tool.

The response to the statement "I am more confident in my academic learning with the help of AI" was more equivocal. The majority (54.1%) were neutral, with 18% agreeing and 23% disagreeing. This shows students don't necessarily feel more confident when using AI. In fact, some may experience more uncertainty when accessing AI-generated information, particularly if they don't know if it's reliable or if they are allowed to use it for their studies.

In summary, Part 2 suggests students view AI as an academic tool, but they are less sure about the impact of AI on performance and confidence. These findings indicate that AI tools can help with academic performance indirectly by enhancing understanding, efficiency and studying, but it does not substitute for learning, hard work and critical thinking.

iii. Perceived Benefits

The results for perceived benefits show that respondents recognize several advantages of AI-based learning tools, although many remain neutral on broader learning outcomes such as critical thinking. For the statement "AI tools make learning more interesting," 52.5% were neutral, 27.9% agreed, and 6.6% strongly agreed. This means that some respondents find AI engaging, but most are undecided.

This may suggest that students do not view AI tools primarily as motivational or entertaining tools. Instead, they may see AI as practical academic support. Previous studies have shown that AI can improve engagement when it is integrated meaningfully into learning activities, but its effect depends on how students use it and how teachers structure AI-assisted learning. Chen, Xie, and Hwang (2020) explained that AI in education has expanded because of its potential to support diverse learning needs, but meaningful adoption requires alignment with educational goals.

For the statement "AI helps me understand agricultural concepts better," 29.5% agreed and 9.8% strongly agreed, while 50.8% remained neutral. This suggests that AI may help some students understand agriculture-related concepts, but the benefit is not yet strongly experienced by most respondents. The neutral response may indicate that students are either not using AI often for agriculture-specific topics or are unsure whether AI explanations are accurate enough for specialized subject matter.

This finding is significant because agriculture-related learning often involves technical concepts, applied knowledge, and context-specific examples. AI tools may help by simplifying terms, explaining processes, generating examples, and connecting concepts to real-life situations. However, because AI-generated information may contain errors, students still need teacher guidance and reliable academic sources when applying AI to specialized fields.

For the statement "AI tools provide quick and helpful feedback," 39.3% agreed and 11.5% strongly agreed, while 44.3% were neutral. This is one of the stronger perceived benefits. It shows that more than half of the respondents recognize AI as a source of immediate feedback. This supports the idea that AI can assist students by giving quick responses, correcting drafts, suggesting improvements, and explaining mistakes.

This result agrees with research indicating that AI-based tools can provide timely support and personalized assistance. Studies on AI in education emphasize that feedback, tutoring, and adaptive learning are among the most promising applications of AI in higher education. Zawacki-Richter et al. (2019) identified student support and intelligent tutoring as major areas where AI is applied in higher education.

For the statement "AI enhances my critical thinking skills," 54.1% were neutral, 24.6% agreed, and 14.8% disagreed. This shows that respondents are uncertain about whether AI improves critical thinking. While AI can help students generate ideas and compare explanations, it may not automatically develop critical thinking unless students actively question, verify, and evaluate AI-generated responses.

This finding is consistent with current scholarly concerns. AI can support higher-order thinking when used as a tool for inquiry, reflection, and comparison; however, it may weaken critical thinking if students simply copy outputs without analysis. Kasneci et al. (2023) stressed that AI tools should be used with caution and should encourage students to evaluate outputs rather than accept them passively.

Overall, Part 3 shows that respondents perceive AI as beneficial mainly in terms of feedback, understanding, and academic support. However, they are less certain about AI's role in making learning more interesting or improving critical thinking. This suggests the need to teach students not only how to use AI tools but also how to use them critically, ethically, and reflectively.

iv. Challenges Encountered

The survey also highlights some problems encountered with using learning tools that are based on AI. For the statement "I rely too much on AI tools for my tasks", 55.7% were neutral, 16.4% agreed and 23% disagreed. This suggests that most aren't sure whether they are becoming overly reliant on AI. Although it's clear that only a small number reported reliance, the large neutral response might mean that students do not fully recognize the impact of AI on their academic performance.

This is a concern as overreliance on AI may limit creativity, critical thinking and problem-solving. Previous studies on generative AI in the classroom have consistently highlighted issues related to overreliance, academic integrity, and decreased critical thinking. Chan and Hu (2023) reported that while students have a positive attitude towards generative AI, they also recognize the issues related to ethics, accuracy and responsible use.

For the statement "I have difficulty using some AI tools" 55.7% were neutral and 34.4% agreed. This indicates that many respondents face challenges with AI platforms. While Part 1 revealed that many students find AI platforms easy to use, this finding suggests that some AI tools are not. Students may encounter difficulties in framing questions, understanding AI answers, selecting appropriate AI, and using AI-generated information to meet coursework requirements.

This suggests the need for AI training. They require training in effective questioning, information verification, avoiding plagiarism, and ethical AI use. Recent research in higher education stresses the need for training, support and ethics guidelines for the integration of AI. For example, studies on AI in higher education point to the importance of awareness, training, and guidelines for successful integration.

For the item "Internet connectivity impacts my use of AI tools" 39.3% agreed and 8.2% strongly agreed, while 45.9% were undecided. This demonstrates the internet is a major constraint for many. Because AI tools primarily rely on the internet, access to the internet is a critical factor for students to benefit from AI-based learning tools.

This finding is particularly significant in situations where digital divides exist. Even if students are open to using AI tools, access to devices and internet, as well as digital infrastructure, can influence their use. Studies on the use of AI technology in education show that readiness and access are important factors in AI use.

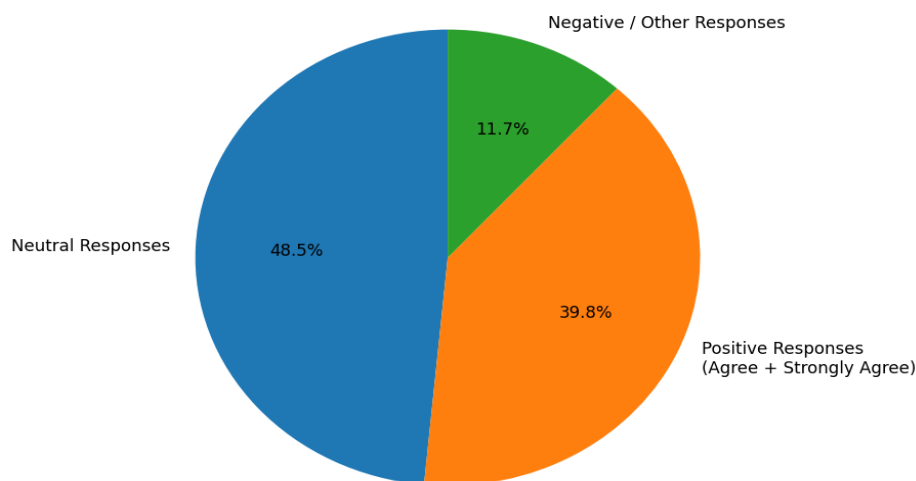
For the question "I am concerned about the accuracy of AI-generated information," 36.1% agreed, 8.2% strongly agreed and 49.2% were neutral. This suggests many participants are concerned or unsure about AI accuracy. This is a fundamental problem as AI tools can sometimes generate inaccurate, out-of-date, prejudiced or even fictitious information.

This conclusion is highly consistent with cautionary academic tales about AI content. Kasneci et al. (2023) noted that large language models can offer educational support but that their outputs need to be checked due to the risk of inaccuracy and bias. Thus, students should be advised to check AI-generated responses against textbooks, research papers, feedback from the teacher, and other reliable sources.

In summary, Part 4 shows the key challenges are potential overreliance, some AI tools being difficult to use, lack of internet access and accuracy concerns. These challenges demonstrate that the use of AI for education needs to be accompanied by digital literacy, ethical policies, appropriate infrastructure, and teacher oversight.

Overall, the findings show that the students perceive AI-based learning tools as helpful, particularly for understanding difficult lessons, efficiency in task completion, improved learning, and immediate feedback. But the results also reveal a pattern of prominent levels of neutral responses for many items. This suggests that students may be experimenting with AI tools and are still settling into their views on the use of AI tools for academic purposes.

Figure 1. Visualizes the summarized survey results on AI-Based Learning tools.

Summarized Survey Results on AI-Based Learning Tools

Summary of overall responses from the survey results.

6. Conclusion

This study the most positive results were in relation to understanding difficult lessons and ease of use, which indicates that students are most familiar with using AI to support their understanding of lessons. This reinforces the idea that AI can be used as a teaching assistant to explain concepts, help students understand difficult topics, and help with completion of academic tasks. This supports the growing body of research on AI in education which highlights the benefits of AI as providing personalized support, adaptation, feedback, and student assistance.

But the findings also reveal that the students are less confident about whether AI directly enhances academic performance, self-esteem, and critical thinking. This distinction is important. While AI might help students' complete tasks more quickly, they still need to understand, practice, and think critically to improve their academic performance. So, AI should be viewed as an assistant, not a substitute for students' learning.

The study also calls for ethical AI practices. Issues with accuracy, internet connectivity, ease of use, and potential over-reliance highlight the need for guided use of AI. Students must learn to critically assess AI content, attribute sources, prevent plagiarism and use AI in a way that helps, rather than hinders, their thinking. This supports the recent studies' suggestion that universities should establish AI literacy curricula, ethics, and policies on AI-supported learning.

Overall, the findings suggest that AI-powered learning tools can help students to study and complete their coursework, especially by enhancing their learning, efficiency, and feedback. However, their benefits depend on students' responsibility and critical use. Guidance from educators, better internet infrastructure, AI literacy programs, and academic policies play an important role in harnessing the potential benefits of AI and avoiding the potential impacts of misinformation, overreliance and critical thinking.

7. Recommendations

Based on the findings of this study, the following recommendations are proposed:

1. Enhance AI Literacy Training for Agriculture Students

Schools and universities should regularly provide AI literacy training to agriculture students. The trainings should include using the AI tool for learning, such as asking good questions, assessing the answers generated by AI tools, checking their validity, and using their output responsibly in academic work. Given that the findings indicate that not all students are convinced about the academic potential of AI tools, training could help increase students' awareness and confidence in efficiently using AI.

AI literacy trainings should also teach students how to reference, avoid plagiarism, to prompt AI tools, and to verify AI tools' answers with textbooks, research papers, teacher feedback, and reliable agricultural sources. This ensures students are not worried or doubtful about the accuracy of AI-based information, according to the research.

2. Use AI Tools in Agriculture Education under Teacher Guidance

AI tools need to be introduced into the agriculture-related courses by the teachers. Given that knowledge in agriculture education is conceptual and practical, AI tools can be used to explain agricultural theories, provide examples, summarize lessons, offer practice questions, and help students digest technical information. But students shouldn't be left unsupervised to use AI.

Teachers may create curriculum activities for students to use AI to compare lessons, assess agricultural issues, generate solutions, and check information with credible sources. This may help ensure AI is used as a tool to enhance the learning process rather than replacing it. The research highlighted that AI may assist students with understanding lessons and doing tasks, but performance still requires understanding, practice, effort and critical thinking.

3. Establish Institutional Policies on the Use of AI

The school should develop policies and guidelines on the use of AI learning tools. These should include details of when it is appropriate to use AI, how to credit AI use, and when AI use is cheating. This is important because our research found concerns around dependence, validity and integrity of AI tools.

Having a policy on AI use can minimize student and teacher confusion. It can also ensure equity, integrity and ethical use of technology. The policy should clarify that AI tools are not replacements for students to analyze, innovate and take responsibility for their learning.

4. Strengthen Internet and Digital Infrastructure

Given the challenges of internet connectivity in using AI tools, higher education institutions should improve digital infrastructure. This could include upgrades in Wi-Fi coverage, access to computer laboratories, AI-assisted learning centers and low-bandwidth or offline learning materials, where feasible.

For students living in regions with unreliable internet connections, universities can schedule time in computer laboratories or make learning resources available for download. This is vital because while students may be keen to use AI-powered tools, if they lack access, they may miss out on the benefits of AI-powered learning.

5. Promote Independent Thought and Learning

Encourage students to use AI tools to support but not replace their learning. Educators may ask students to explain, assess, or reflect on AI responses as opposed to solely turning in AI-generated responses. For instance, students could be required to compare AI information with textbook explanations, explain AI errors, or edit AI information with scholarly sources.

This is an important recommendation because the study revealed students doubt the effectiveness of AI in enhancing critical thinking. It also found AI may only improve learning if students evaluate and improve the information provided by AI.

6. Train Teachers in AI-Based Teaching

Educators should also be trained on using AI technologies in agricultural education. Instructors should know how AI can be used to plan lessons, assess students, provide feedback, and engage students. Faculty training ensures teachers can better support students and avoid AI misuse in assessments.

Workshops can cover AI-based lesson preparation, AI-based assessment, using AI ethically, prompt engineering, and detecting AI misuse. Because the study found teacher support is needed to better use AI, training is needed for AI to be effective.

7. Promote AI as a Complement to, not a Substitute for, Academic Success

The study reveals that students do not correlate using AI with improving their academic performance, although they see the value in learning, grasping lessons, and doing homework. As such, AI should be encouraged as a learning tool, not as a means of enhancing academic performance.

Students should be educated that academic performance still requires discipline, understanding, active participation, learning, and applying agricultural knowledge for practical use. AI can be used to learn, but it cannot provide understanding, experience and skills.

8. Conduct Further Studies on AI in Agriculture Education

We also encourage future researchers to pursue more research into AI learning tools in agriculture education. Future research may include more sample sizes, compare responses across different agriculture training institutions, or look at differences in various year levels, gender, academic performance, and access to technology.

In addition, future studies should employ mixed methods, including surveys and interviews or focus group discussions. This will give us a better understanding of how agriculture students use AI tools, the difficulties they face, and the impact of AI on their learning strategies and academic performance.

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