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**Empowering Educators:
Integrating AI in
Agricultural Classrooms**

AI in the Classroom: Here to Stay (But Not Me)

by Dr. Gaea Hock

The rapid increase in available artificial intelligence tools and technologies in the education field has been fascinating to observe this past year. As educators, we are all grappling with how to best use the tools, while not letting them take over our jobs. (I recently had a student make a statement to that respect.)

This fall, I put my first AI Use statements in my syllabi. I modified the statement depending on the class and how I envisioned my students using the technology. For my teaching methods class, I want them to start using tools that will benefit them as teachers. But for my first-semester students, I want to learn what they know and where their talents lie without being aided by certain AI tools.

I also participated in two professional development workshops focused on how college professors are integrating (or not) AI in their classrooms. Discussions and debates were had on this topic, but we concluded that no matter our personal feelings, this tech-

nology is not going away. It is our responsibility as educators to help our students learn how to use it, without abusing it.

Each of you might also be contemplating how to best use AI and how you are allowing your students to use it. There are benefits and drawbacks of integrating AI into classroom settings which need to be considered as this technology increases in its adoption.

Benefits to Teachers:

- Lighten teachers' workload (automate repetitive tasks, assist with grading and providing feedback, write email drafts to parents/sponsors)
- Allows more time to connect with students in meaningful ways, curriculum design, more creative assignments, facilitating higher order thinking and discussions
- Potential to decrease teacher burn out by streamlining some of the work (presentation design, rubric creation, etc.)
- Assist with diversifying instruction based on student's learn-

ing needs by analyzing data and student assignments

Benefits to Students:

- Allows for more personalized learning experiences (self-paced learning, access to individualized resources and tools, scaffolded assignments and assessments)
- Accessibility of resources and learning materials (translation into native language, content explanation,
- Self-paced and individualized content such as answering specific questions on content to help break it down to a level that is comprehensible.
- Increase in gamified elements that help hold students' attention and focus while also being self-motivating.

Concerns for Teachers:

- Time and training required to properly and ethically use AI tools in the classroom
- Loss of a feeling of personal fulfillment depending on the type of AI integration being used in the classroom

Example AI Statement in a Teaching Methods Class

Use of AI: This course encourages and embraces the ethical use of Artificial Intelligence (AI). As a student in this course, you will sometimes be required to incorporate AI tools in your work. Our use of AI will allow us to develop our understanding of this technology and examine the complex challenges and opportunities it offers to us, both as students and future professionals. In accordance with university policies around academic integrity in the Student Code of Conduct, we will be transparent in our use of AI in the completion of any classroom tasks. **For the purposes of this class, you should cite AI tools as follows: "Title of AI Tool. Prompt or brief description of topic of search depending on tool. Date of creation."** Using an AI tool to generate assignment content without proper attribution would be a violation of the K-State Honor Pledge. Failure to acknowledge the use of AI can result in the loss of some or all assignment points.

- Lack of proper technology for full integration by students could lead to achievement gaps

Concerns for Students:

- Concern that students will become overly reliant on AI technologies
- Possible decrease in critical thinking, problem-solving and writing skills due to not having to think about the answer/problem at a deeper level.
- Exposure to bias and inaccuracies in the content provided by AI tools
- Privacy concerns with the type of information being provided to the AI systems

Incorporating AI technology into classrooms holds significant potential for enhancing education. It can streamline administrative tasks for teachers, provide personalized learning experiences for students, and allow for quicker completion of certain tasks. However, its use should be balanced carefully to avoid over-reliance on technology, mitigate privacy concerns, and negative learning effects. By addressing these challenges, AI can become a powerful tool that supports and enriches the educational process.

At the end of the day, this technology is not going away. We need to learn how to use it in an ethical way while also preparing our students to do the same.

(Portions of this editorial were written with assistance from ChatGPT.)

The end of an era.

This is my final issue as the Editor of The Agricultural Education Magazine. It has been a wonderful six years with many changes. When I took over in 2019 when we were still printing and mailing the magazines. They were limited to 28 pages of black and white print and images. The expenses were higher than the income each year. In 2020, the magazine moved to online-only which allowed us to expand the size, hire a graphic designer, and secure sponsorship to fund the magazine. The Editing and Managing Board helped guide the magazine through these changes.

In addition to changes of the Magazine, I have personally experienced many changes these past six years. I welcomed my second child, navigated teaching and parenting through a pandemic, lost my home to a fire, got promoted to full professor, and visited Disneyland/World several times. Learning to balance my personal and professional life while also publishing this magazine bi-monthly was only accomplished by the 36+ theme editors who agreed to take on championing their theme issue.

I have thoroughly enjoyed serving as the Editor of this magazine these past six years. I read each and everyone of the articles, wrote 36 editor articles, and corresponded with theme editors and authors throughout the years. We have had themes on each aspect of the school-based agricultural education model,

non-formal learning, agricultural safety, diversity, global agriculture and educational technology these past six years.

As I prepare to hand over the Editor duties to Dr. Laura Hasselquist (who will do a fantastic job in this role), I want to take a moment to thank a few key individuals. Huge thank you to the members of the Editing managing board who take their role of promoting and supporting the magazine seriously and with care. Thank you to Dr. Jay Jackman who has been my constant supporter at NAAE and serves as the Business Manager of the Magazine. His dedication to the role helped the Magazine transition from a mailed document to the robust online Magazine we currently enjoy. Thank you to each of the theme editors for their work and to all the authors for taking the time to share their expertise with the profession. Huge thank you to Dr. Courtney Gibson who currently serves as the graphic designer of the Magazine for updating the look and catching the issues as we finalize each issue.

This magazine has been in existence since January 1929. The themes and topics have been reflective of the current state of agricultural education and are an excellent source of information for our profession. I will continue to engage with the magazine and encourage you to do the same as we near the 100th anniversary of the publication.



Dr. Gaea Hock is a Professor of Agricultural Education at Kansas State University and Editor of The Agricultural Education Magazine.



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Note: These images were created using *Adobe Firefly*, an AI image generator.

Distribution

Beginning with Volume 93, Issue 1, (July/August 2020), *The Agricultural Education Magazine* will be available in electronic format only, free to all, accessed through the website of the National Association of Agricultural Educators at <http://www.naaee.org/profdevelopment/magazine>. All available back issues of the magazines are archived at this web address, also free to all.

Business Manager

Dr. Jay Jackman, 2525 Harrodsburg Road, Suite 200, Lexington, Kentucky 40504-3358.

E-mail: JJackman.NAAE@uky.edu.

Article Submission

Articles and photographs should be submitted to the Editor or Theme Editor. They will acknowledge their submission. Items to be considered for publication should be submitted at least 90 days prior to the publication date of the intended issue. No items are returned unless accompanied by a written request. Articles should be approximately 1500 words. Information about the author(s) should be included at the end of the article. Photos and/or drawings appropriate for the “theme issue” are welcomed and should be submitted as separate files (jpg or tiff format preferred – minimum 300 dpi). A recent photograph (jpg or tiff format preferred– minimum 300 dpi) of all authors should accompany the article. Articles in the Magazine may be reproduced without permission but should be acknowledged.

Editor

Dr. Gaea Hock, Professor, Agricultural Education, Kansas State University, 315 Umberger Hall, Manhattan, Kansas 66506, Phone (785) 532-1166, FAX: (785) 532-5633.

E-mail: ghock@ksu.edu

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Design and Layout

Dr. Courtney Gibson, Associate Professor, Agricultural Communications, Texas Tech University.

Email: courtney.d.gibson@ttu.edu



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AI Tools in Ag Education: A New Era of Teaching and Learning

by Kylie Harlan & Dr. Courtney Meyers

Until just a few years ago, Artificial Intelligence (AI) seemed relegated to science fiction movies and works of fiction. However, we now have AI tools at our fingertips, and they are changing how we interact with information and each other. Although AI has many applications in fields as distinct as business, healthcare, and the arts, we are most familiar with how it is being integrated with education. We teach at the collegiate level and have witnessed the benefits and risks of generative AI. We are excited to provide you with this magazine theme, which taps into one of the most radical disruptions we have witnessed in our educational careers.

We begin this issue with Jay Solomon's introduction of 10 ways agriculture teachers can use AI tools. One of the strategies

he mentioned was virtual field trips and simulations. This is of particular interest to us because we have worked on the iVisit Project (theivisitproject.com), which has created tours of various agricultural sciences and natural resource sites.

Sidney Pehrson and Tyson Sorenson share the results of a recent research project of Utah agriculture teachers to explore their perceptions and professional development needs. They provide suggestions for current teachers along with those working to prepare future teachers on how to best utilize AI tools.

Caleb Hickman leads an author team of agriculture teachers who discuss how they have used AI tools in the three main roles of agricultural education – classroom instruction, SAEs, and FFA. It's encouraging to see how AI

tools have been tried and tested in agricultural education programs and other teachers can learn from these perspectives.

After learning about AI tools and their applications in general, we shift to several articles that provide benefits for different situations. Tyler Granberry recognizes the assistance AI tools can provide to create individualized instruction. These resources require teachers to recognize their students' learning needs first, but using the tools removes perceived or real barriers in providing more accessible content.

Hailey Browning and Randy Lund suggest ways to use AI that may help reduce teacher burnout and administrative overload. The article acknowledges these are significant stressors for agriculture teachers and the authors share recommendations for using AI to help alleviate some of this pressure. This article also provides a more in-depth look at a specific AI tool, Breezy TA, which features more than 20 tools designed with teachers in mind.

Two of the more familiar AI tools for educators are ChatGPT and Magic AI. Joe Ramstad and Scott Smalley explain how these platforms can be used to complete a variety of tasks. If you are



Generative AI tools pull their information from available online content and deliver it in an easy-to-access manner. However, users should be aware of potential bias, misinformation, and incorrect details presented. Note: This image was created using Adobe Firefly, an AI image generator.

new to using AI tools, this article provides steps to follow and advice for getting the most out of these tools.

Trent Van Leuven shares advice on how he uses AI tools to encourage engagement in his classroom. He discusses how he has used generative AI to complete several responsibilities in his role as a high school agriculture teacher.

For agricultural mechanics teachers, Garrett Hancock provides practical suggestions for how AI can be integrated in the classroom to teach safety. This article also provides examples of how to write better prompts for the AI tool, which is a necessary step to gain the most from these platforms.

Jaehyun Ahn and his colleagues present a novel idea for using AI to explore the complex subject of food security. As our students grow more accustomed to using AI tools, and their future education and careers require their use, it is vital today's students recognize the potential of AI to analyze large datasets. This information can then be used to make real-world decisions.

Another area of AI application presented in this issue addresses its integration in FFA Career Development Events. Jessica Benson and her co-authors explore how agriculture teachers can use AI to train CDE and LDE teams. Additionally, Lily Oliphant introduces a new CDE being launched in Washington to help students learn more about using AI tools to improve agricultural systems.

Finally, we are proud to share this issue with the winners of the ATA Essay Content, coordinated by Jay Solomonson. The theme this year was "Artificial Intelligence in Agricultural Education?" and the winners provide thought-providing insights to address this question.

On a special note, I (Courtney) am especially honored to be involved in bringing this issue to life as it marks Gaea Hock's final issue as the magazine editor. For the past 6 years and 36 issues, she has coordinated the process to share insights and advice with agriculture teachers across the nation. I may be a little biased in my admiration due to the family connection (we are twins, after all), but I can honestly say she has been dedicated to helping reach

teachers with the information, encouragement, and support they need to excel. While the magazine is passing into other capable hands with Dr. Laura Hasselquist at the helm, it has been an honor to play a part in the final issue of Dr. Hock's oversight.



Kylie Harlan, M.S., is a lecturer in agricultural communications at Texas Tech. She teaches several writing-intensive and professional development courses.



Courtney Meyers, Ph.D., is a professor in agricultural communications at Texas Tech. She also serves as the Graduate Studies Coordinator and Associate Chair for the Department of Agricultural Education & Communications.

ReimAGining EDucation with AI: Ten Uses of Artificial Intelligence for the High School Agriculture Teacher

by Dr. Jay Solomonson

When I began college in the late 1990s, I had several courses on the use of AI in agriculture. These courses focused on best practices and emphasized how this technology has and will continue to impact the agricultural industry. Of course, to those of us in agriculture at the time, AI meant Artificial Insemination (not Artificial Intelligence), and our ultimate goal was to accelerate the rate of genetic improvement in our livestock. While I appreciated my artificial insemination training in those animal science courses, I was a little hesitant to learn about and adopt the other AI (Artificial Intelligence) later in my career. To give you some perspective, my first exposure to Artificial Intelligence (AI) was what I learned from *The Terminator* movies, so you might understand why I was slow to learn about and adopt this new technology. However, over the past several years, I have learned that artificial intelligence, just like artificial insemination, can be a useful and powerful tool for those of us in agriculture, and we shouldn't be afraid to implement it within our agricultural education programs.

New technologies continue to revolutionize how we teach and learn in the fast-paced world of agricultural education, and Artificial Intelligence (AI) is now at the

forefront of this transformation. It offers educators innovative tools to enhance teaching methods, improve student outcomes, and save valuable time. Integrating AI into our classrooms can provide high school agriculture teachers with numerous benefits, from streamlining administrative tasks to enhancing lesson planning and assessment creation. By leveraging AI, agriculture teachers can also create dynamic, personalized

technology. AI-powered lesson planning tools have the ability to quickly analyze vast amounts of data related to student performance, learning objectives, and curriculum standards to generate personalized lesson plans. These plans can also incorporate various teaching strategies, resources, and activities tailored to your student's specific needs and interests. Even education-specific platforms with free versions, such as [Magic-School.AI](#) or [Breezyta.com](#) (I have used and recommend both.), can generate some great lesson ideas based on basic input from the teacher. Other common generative AI sites, like [ChatGPT](#), [Copilot](#), and [Google Gemini](#), can create

AI-driven adaptive learning platforms offer agriculture teachers a powerful tool for providing personalized learning experiences that cater to the diverse needs of their students.

similar lesson plans (because they often use the same LLMs or Large Language Models). The key to creating any detailed lesson plan on these platforms is proper prompt engineering by the user. Many websites can provide tutorials on how to do this successfully. Again, by utilizing AI in lesson planning, agriculture teachers can save large amounts of time, optimize instructional practices, and ensure that each lesson is engaging and impactful for their students.

learning environments that prepare students for success in the evolving field of agriculture. This article will explore these topics and 10 specific uses of AI that agriculture teachers can immediately begin using in their programs to make them more productive and efficient educators.

1. Smarter Lesson Planning

One of the most useful applications of AI is assisting with creating engaging lesson plans. As we all know, lesson planning is a cornerstone of effective teaching, and AI can play a significant role in making this process more efficient and effective for agriculture teachers. If AI-generated lesson plans can save an agriculture teacher just one hour a week, it would be worth learning how to use the

similar lesson plans (because they often use the same LLMs or Large Language Models). The key to creating any detailed lesson plan on these platforms is proper prompt engineering by the user. Many websites can provide tutorials on how to do this successfully. Again, by utilizing AI in lesson planning, agriculture teachers can save large amounts of time, optimize instructional practices, and ensure that each lesson is engaging and impactful for their students.

2. Efficient Curriculum Mapping

Mapping out a cohesive curriculum is essential for ensuring students receive comprehensive agricultural education instruction throughout their high school careers. However, this process can

often be complex and time-consuming for high school agriculture teachers. AI-powered curriculum mapping tools offer a solution by automating the organization and alignment of learning objectives, standards, and resources. These tools enable teachers to visualize their curriculum's scope and sequence, identify improvement areas, and make data-driven decisions to enhance student learning outcomes. For instance, **Kiddom** uses AI algorithms to analyze curriculum data and provide actionable curriculum development and implementation insights. The lesson planning sites mentioned earlier can also be useful resources for curriculum mapping. Several have unit plan generators that could accomplish this task. By harnessing AI in curriculum mapping, agriculture teachers can create robust and coherent instructional plans that align with educational standards and meet the diverse needs of their students.

3. Creating Assessments with Ease

Assessment is a critical component of the teaching and learning process, providing valuable feedback to teachers, administrators, students, and parents. AI-powered assessment tools offer agriculture teachers a wide range of options for creating and administering assessments that are both rigorous and relevant to topics in agricultural education. These tools employ AI algorithms to generate diverse and personalized assessment items, including multiple-choice questions, short-answer prompts, and performance tasks. For example, platforms such as **Pear Deck Assessment** and **Quizizz** provide access to extensive question banks and automated scoring features that streamline the assessment creation process. Additionally, AI analytics can analyze student responses in real time, allowing teachers to identify areas

of strength and weakness and adjust their instructional practices accordingly. Further, I have witnessed many agriculture teachers and FFA advisors using AI technologies to create Career Development Event (CDE) exams and practicums. They have used them for contests they are hosting and for preparing their teams for state and national competitions.

4. Automating Rubric Generation

Rubrics are valuable tools for assessing student projects and assignments, providing clear criteria for evaluating student work, and sharing valuable feedback. However, creating rubrics can be time-consuming and challenging for agriculture teachers. AI-powered rubric generation tools offer a solution by automating the process of creating customized rubrics based on predefined criteria and learning objectives. These tools enable teachers to quickly generate rubrics that align with the specific requirements of agricultural projects, ensuring consistency and fairness in the assessment process. For instance, platforms such as **MagicSchool.AI** and **ClassX** use AI algorithms to analyze assignment parameters and generate rubrics that accurately reflect the desired learning outcomes. Creating rubrics with AI can streamline the assessment process (especially for laboratory instruction), save time, and provide students with clear expectations for their assignments.

5. Streamlining Email Communication

Effective communication is essential for fostering collaboration and engagement with our various stakeholders in the agricultural education profession. However, due to the sheer volume of emails we receive on a daily basis, managing this type of communication can often be



Image created using Google Gemini AI.

overwhelming. AI-powered email assistants offer a solution by automating routine email tasks and providing valuable insights for improving communication effectiveness. These assistants use AI algorithms to analyze email content, suggest improvements, and schedule messages for optimal timing. For example, applications such as **Grammarly** and **Boomerang** offer AI-powered features such as grammar and spell-checking, email scheduling, response tracking, and enhancing productivity and communication efficiency. **MagicSchool.AI** also has an amazing email responder tool that I have found useful. By using these tools, agriculture teachers can streamline their workflow, prioritize important messages, and ensure clear communication with students, parents, and colleagues.

6. Engaging Bell Ringers and Exit Slips

Bell ringers and exit slips are valuable instructional tools for getting students on task at the beginning of class and assessing student understanding at the end of a lesson. AI-powered platforms offer agriculture teachers a wide range of options for creating dynamic and interactive bell ringers and exit slips tailored to agricultural education topics. These platforms apply AI technology to generate question prompts, quizzes, and polls that capture student's attention and provide valuable insights into their understanding of agricultural concepts taught in class. For example, platforms such as **Pear Deck Assessment** and **Kahoot!** offer AI-powered templates and question banks that enable teachers to create engaging pre- and post-lesson activities reinforcing key lesson concepts. Agriculture teachers can use these AI-supported technologies to enhance student engagement, assess learning progress, and inform instructional decision-making in real-time.

7. Personalized Learning Experiences

Every student is unique, with individual strengths, interests, and learning preferences. AI-driven adaptive learning platforms offer agriculture teachers a powerful tool for providing personalized learning experiences that cater to the diverse needs of their students. These platforms use AI to analyze student performance data and identify areas for improvement, allowing teachers to tailor instruction to each student's specific needs and learning goals. For example, platforms such as **PowerSchool AI** and **Dream-Box** (Discovery Education) offer adaptive learning pathways that adjust content and difficulty levels based on students' responses, ensuring they receive targeted support and scaffolding as needed. These technologies can help agriculture teachers by empowering students to take ownership of their learning, build confidence, and achieve academic success in academic and agricultural topics.

8. Virtual Field Trips and Simulations

Field trips and hands-on experiences are invaluable for bringing abstract concepts to life and deepening students' understanding of agricultural topics. AI-powered virtual reality (VR) and augmented reality (AR) simulations offer agriculture teachers a cost-effective alternative to traditional field trips, enabling students to explore agricultural concepts in immersive virtual environments. These simulations allow students to visit farms, agricultural research centers, and other relevant locations without leaving the classroom, providing opportunities for discovery and experiential learning. For example, resources such as **Nearpod VR** and **Google Arts and Culture** (formally known as Google Expeditions) offer a library of virtual field trips and simulations covering various agricultural topics, from plant growth and animal

husbandry to sustainable farming practices. Virtual field trips and simulations using AI technology can help agriculture teachers by enhancing student engagement, facilitating inquiry-based learning, and fostering a deeper appreciation for the role of agriculture in society.

9. Data-Driven Decision Making

Data-driven decision-making is essential for improving agricultural education instructional practices and student outcomes. AI analytics tools offer agriculture teachers a wealth of data insights that can inform instructional planning, intervention strategies, and program evaluation. These tools use AI algorithms to analyze student performance data, engagement metrics, and other relevant indicators, allowing teachers to identify trends, patterns, and areas for improvement. For example, **Google Classroom Analytics** offers customizable dashboards and reports that provide real-time insights into student progress and learning outcomes. By using AI in data-driven decision-making, agriculture teachers can optimize instructional practices, identify and address learning gaps, and ensure all students have the support they need to succeed in their agricultural education classrooms.

10. Promoting Equity and Inclusion

Equity and inclusion are core values in agricultural education, and AI can play a vital role in ensuring that all students have access to high-quality learning experiences. AI-driven accessibility tools offer agriculture teachers a range of features and support to accommodate students with diverse learning needs and abilities. These tools use AI to provide text-to-speech, translation, and dyslexia support (among other features) to make educational materials more accessible and inclusive for all students. For example, tools

such as **Immersive Reader** and **Read&Write** offer customizable accessibility features that enable students to engage with classroom content in ways that suit their individual preferences and abilities. Promoting equity and inclusion is essential in our profession, and AI can help create a learning environment where all students feel valued, supported, and empowered to succeed.

Summary

In conclusion, AI offers many opportunities for high school agriculture teachers to enhance teaching effectiveness, improve student engagement, and streamline administrative tasks. By harnessing the power of AI-driven tools and technologies, agriculture teachers can create dynamic, personalized

learning experiences that prepare students for success in the ever-evolving field of agriculture. As AI continues to evolve, its potential to transform agricultural education and empower the next generation of agricultural leaders is limitless.

AI Websites Mentioned In This Article:

MagicSchool.AI - <https://www.magicschool.ai/>

Breezyta.com- <https://breezyta.com/index.php>

ChatGPT - <https://chatgpt.com/>

Copilot - <https://copilot.microsoft.com/>

Google Gemini - <https://gemini.google.com/app>

Kiddom - <https://www.kiddom.co/>

Pear Deck Assessment - <https://www.peardeck.com/products/pear-assessment>

Quizizz - <https://quizizz.com/?lng=en>

ClassX - <https://classx.org/>

Grammarly - <https://www.grammarly.com/>

Boomerang - <https://www.boomeranggmail.com/>

Kahoot! - <https://kahoot.com/>

PowerSchool AI - <https://www.powerschool.com/powerschool-ai/>

DreamBox - <https://www.dreambox.com/>

Nearpod VR - <https://nearpod.com/nearpod-vr>

Google Arts and Culture - <https://artsandculture.google.com/project/expeditions>

Google Classroom Analytics - <https://support.google.com/edu/classroom/answer/14221372?hl=en>

Immersive Reader - <https://www.microsoft.com/en-us/education/products/learning-tools>

Read&Write - <https://www.texthelp.com/en-us/products/read-write/>



Jay Solomonson is an Assistant Professor of Agricultural Education at Illinois State University; jksolom@ilstu.edu

Integrating AI in Agricultural Education: Benefits, Challenges, and Practical Tips

by Dr. Tyson Sorensen & Sidney Pehrson

The Future of Agriculture and the Role of AI

Agriculture is rapidly evolving, with artificial intelligence (AI) technologies poised to revolutionize the industry. From precision farming to automated machinery, AI's role in agriculture is expanding. AI in agriculture and the workforce is therefore a relevant and significant topic. Integrating AI into agricultural education could be an important step in equipping students with the skills they need for their future. So, the question we should ask ourselves is, are we adequately preparing students for the AI-driven careers of today and tomorrow? This means not only teaching students about the latest technologies, but also fostering a mindset that embraces innovation and change. By integrating AI concepts into curriculum and teaching methods, we can help students develop a deep understanding of how these tools can be applied across various agricultural fields, from crop management to animal husbandry and beyond.

Insights from a Recent Study with Agriculture Teachers

We recently conducted a study among Utah agriculture teachers exploring their perceptions and professional development needs regarding AI. The findings highlight key areas where teachers feel both excite-

ment and concern about integrating AI into their curricula.

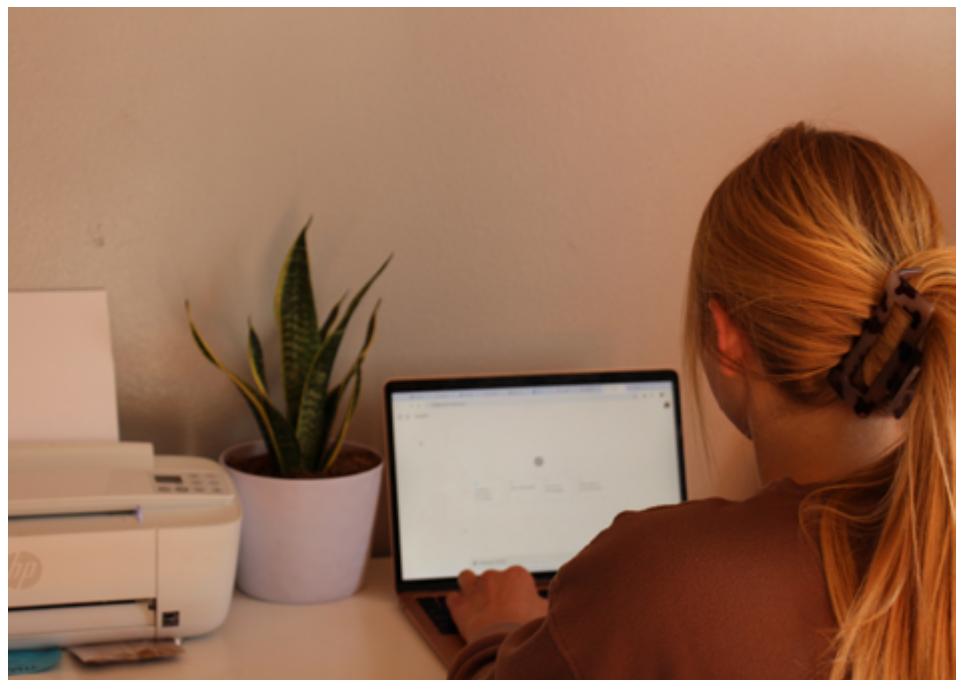
Overall, there is a sense of excitement among agriculture teachers about AI. Its potential is certainly recognized and there is a notable demand for the benefits it can offer. One of the most popularly agreed upon statements among participants in the research study was, "I think that AI can improve the overall success of my program." This sentiment suggests a positive outlook towards integrating AI within the classroom. However, this enthusiasm is tempered by feelings of

being overwhelmed, unsure, or even apprehensive about AI and its recent gain in popularity.

Our study also investigated teachers' fears, objections, and frustrations regarding AI. A clear pattern emerged from these responses. Most concerns revolved around the ways in which students are exposed to AI and their own use of AI. Although there is a fair amount of concern surrounding AI, agriculture teachers generally agreed that "Teaching students about AI is important for their future success."

This means not only teaching students about the latest technologies, but also fostering a mindset that embraces innovation and change.

A young teacher explores the functions and features of AI in order to understand how she can improve her teaching.



WHAT CAN AI DO FOR YOU?

1
Save Time
AI handles tasks like grading and attendance, giving you more time for teaching

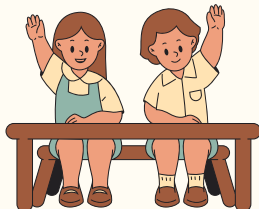


2
Professional Growth
AI suggests courses and resources for your own professional development.

3
Lesson Resources
AI recommends lesson resources and topics based on students' progress and interests.



4
Engagement Booster
AI offers unique interactive tools like simulations and virtual labs to enhance learning.



5
Language Support
AI translates materials, supporting students from diverse linguistic backgrounds.



6
Personalized Learning
AI customizes education to each student's needs, ensuring effective learning.

An infographic showcasing how AI empowers teachers to personalize education and streamline tasks.

The Positive Side of AI in Teaching

The benefits AI has to offer truly depends on you, your teaching style, your willingness to integrate it into your teaching practice, and the ways you choose to utilize it. There are several key areas in which AI can benefit you and your students in the classroom:

- 1. Saving time:** AI can streamline administrative tasks such as grading and attendance, freeing up time for you to focus on your instruction.
- 2. Professional development:** AI can provide personalized recommendations for your own professional development, suggesting courses and resources to help you improve your teaching practices and content knowledge.
- 3. Resource recommendation:** AI can suggest relevant resources, such as articles, videos, and practice problems, based on students' current progress and interests.
- 4. Enhanced engagement:** AI can offer innovative ways to engage students through interactive simulations, virtual labs, customized feedback, etc.
- 5. Language translation and support:** AI can assist in translating materials and providing support for students who speak different languages, making education more accessible to diverse student populations.
- 6. Personalized learning:** AI can tailor educational experiences to individual students' needs, learning styles, and paces, ensuring that each student receives the support they need to succeed.

Concerns and Professional Development Needs

Despite the numerous benefits, there are very valid concerns about integrating AI in education. As we previously mentioned, many of these concerns revolve around students' use of and exposure to AI. From our research, we found the number one concern for teachers is the potential for cheating among students. AI tools can easily be misused by students, making it crucial to establish clear guidelines and ethical use policies. Another concern that is high on the list is the potential for over-reliance on AI technologies. In the aforementioned study, nearly half of all participants either agreed or strongly agreed that AI takes away student creativity. Students can become overly dependent on AI tools in a way that hinders the development of critical thinking and problem-solving skills. Lastly, a concern that may not immediately come to mind, but is no less important to consider, is student equity and access. Providing all students with access to AI tools and resources ensures the educational opportunities and outcomes are fair and equitable.

Practical Advice for Utilizing AI in Agricultural Education

The following are suggestions and steps to take to start integrating AI into your classroom:

1. **Learn one tool at a time:** There is an AI tool out there for almost every aspect of teaching. Don't get overwhelmed by the multitude of AI tools available to you. Start with one tool in the area(s) where you need the most help, get comfortable with it, and then gradually add more.
2. **Seek support:** Find a colleague who is already using AI and ask for help. Collaboration can ease the learning curve and boost your confidence.
3. **Stay current:** The best time to start is now. Keeping up with AI advancements will prevent you from falling behind, and you will be able to better assist students with using AI correctly.
4. **Encourage student use of AI:** Integrate AI into student assignments, focusing on higher-order thinking skills like analysis, synthesis, and evaluation. Use Bloom's taxonomy to guide the integration.
5. **Promote critical thinking:** Teach students how to use AI tools responsibly and critically. Encourage them to question and analyze the outputs of AI, fostering a deeper understanding of topics.
6. **Leverage AI for lesson planning:** Use AI to generate lesson ideas, activity plans, and assessments. AI can assist in creating engaging and effective instructional materials. Just remember to review AI outputs carefully and make it your own.

Overall, start small and build confidence. Don't be afraid to adapt and innovate your teaching practices. Remember, you have the power to decide whether AI will be helpful or harmful in your classroom. Lead by example!



Dr. Tyson Sorensen is an Associate Professor of Agricultural Education and is the program leader for the agricultural education program at Utah State University.



Sidney Pehrson is an undergraduate student and researcher studying agricultural education at Utah State University.

AI-Powered Ag Ed: Transforming Overwhelm into Empowerment in the Classroom, FFA, and SAEs

by Lori Romie, Dr. Stephanie Jolliff, Caleb Hickman, & Dr. Kellie Claflin

As teachers, we have always been on the hunt for ways to make our jobs easier. Enter AI—the innovative tool that makes those “what if” moments a reality, making the job less draining and more empowering. Sounds too good to be true, right? Well, spoiler alert: while typing this article, we had some help from AI. But trust us, this comes straight from the heart—and the combined brains—of three teachers who have discovered that AI is not just a tool; it is a game-changer. Teaching got much more manageable when AI came on the scene, but it still has a bad rap. Why? Mainly because folks do not know how to use it.

So, how exactly did we go from AI skeptics to full-blown

advocates? It all started with each of us tackling the unique challenges of agricultural education—whether it was managing a classroom, organizing FFA events, or guiding students through their SAEs. The three of us realized that AI was not just some futuristic gimmick; it was a powerful ally that could transform how we teach, mentor, and inspire our students. In the following sections, we will share our personal stories of how we have integrated AI into the three core components of Ag Ed: the classroom, SAEs, and FFA activities. Buckle up, because this is where the magic happens!

Classroom Instruction

As the story goes, one of us found himself in a pickle as a first-year agricultural science

teacher. Hired late in the process, the district had already set purchase orders and course options in motion, leaving the daunting task of creating lesson plans and curriculum entirely up to him. While grateful for the support of friends who helped with the curriculum, the real challenge was finding a way to bring his creative vision to life. Then, instead of drowning in the chaos, he discovered a secret weapon that empowered him to achieve just that: artificial intelligence.

In the classroom, AI quickly became his time-saving ally. Programs such as Magic School AI transformed how lessons were planned, assessments were developed, and classroom content was delivered. With Magic School AI, educators can effortlessly create lessons, craft

Many AI tools offer possibilities for enhancing how we teach, manage, and engage students across the three core components of SBAE: Classroom Instruction, SAEs, and FFA. A few examples are shown here.



multiple-choice questions, and generate discussion prompts based on YouTube videos. This tool did not just save time—it re-defined efficiency, allowing him to focus on what truly mattered: engaging his students with creative, dynamic lessons.

Then came ChatGPT, which quickly became a classroom favorite for sparking creativity. Its use also raised important questions about the ethical use of AI. While great for idea generation, students were reminded that their work should reflect their thoughts, not just AI suggestions. To protect academic integrity, we reviewed National FFA’s AI policy and added a clear statement to our syllabi: AI can be used for ideas and feedback, but not as a substitute for original work. If AI misuse is suspected, students may need to complete a quiz check or provide revision history to ensure their submissions reflect their true understanding.

SAEs

With the classroom humming along efficiently thanks to AI, the natural next step is to explore how these tools can transform SAEs. For one of us—a teacher with 28 years of experience in SBAE—the evolution of education has been a journey from chalkboards to cutting-edge technology. In today’s fast-paced, digital world, it is more important than ever for educators to embrace innovative tools that enhance student learning and relieve the growing pressures on teachers.

Just as AI streamlines classroom instruction, it can also bring new life to the brainstorming phase of SAEs. Students can use tools such as ChatGPT to craft Key Performance Indicators (KPIs) or SMART goals tailored to their workplace objectives, making the goal-setting process smoother and more efficient. AI can offer real-time critiques of business plans, provide feedback on training agreements,

and suggest ways to deepen the connection between employers and students. Grammarly, a tool familiar to many, can help students polish their journal entries in the Agricultural Experience Tracker (AET), ensuring their records are well-written. This personalized interaction helps students better understand their SAEs, enabling them to grow and improve the clarity and completion of their projects.

For entrepreneurship SAEs, AI can automate various tasks, such as content creation for marketing and customer support, through AI-driven chatbots. Platforms such as Mizou offer tools that analyze market trends and consumer behavior, guiding students toward strategies that optimize business operations and profitability. A recent study by Pimentel et al. (2024) highlighted that high school students valued AI chatbots for providing comfort during the learning process, immediate feedback, and suitability for educational needs.

Teachers can choose from a variety of AI tools to help them save time to complete professional tasks.

AI Time Saving Apps

Graphic & Lesson Designs

Teachers can use Canva for:

- Create visually appealing images such as infographics and posters that complement text-heavy learning materials
- Use AI Magic to make presentations, edit to help save time and effort.

Canva



perplexity

Perplexity .AI

Three Circle Supports

Perplexity AI is a conversational AI tool. Teachers can use it for:

- Lesson research, homework assistance, interactive learning, content summarization, and
- Classroom discussions, language translation
- Assessment research, professional development, parent communication, and administrative tasks

Classroom Supports

- Magic School is an efficient application that incorporates a variety of teaching techniques, resources, assessments, and differentiation to engage learners.
- Create, refine, and personalize instructional materials.

Magic School.AI



Sherpa

Sherpa labs.co

Differentiation & Leveling

- Voice-enabled assignments for students to chat about their research papers or class materials
- Formative and summative feedback
- Transcript summaries
- The ability to enable you to have a conversation with every single student in your class.

Life Assistant

- Brainstorming communication - emails, letters of reference
- Tips for effective time management, strategies for organizing FFA and SAE activities.
- Stress relief techniques, generating ideas

ChatGPT



This blend of tradition and technology is helping prepare students for tomorrow's challenges today. Additionally, using Canva for marketing allows students to expand their SAE market reach, create impactful presentations, and effectively communicate their KPI goals and achievements to potential employers.

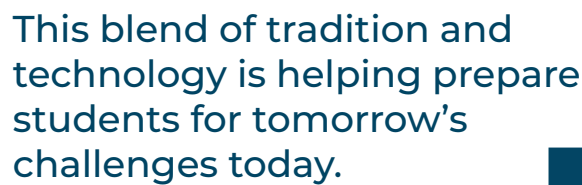
But AI's utility extends beyond just entrepreneurship. In Exploratory projects, tools such as Perplexity can analyze large datasets and offer insights into agricultural industry trends, helping students explore potential career paths with greater confidence. For Experiment SAEs, AI brings predictive analytics and data modeling to the forefront, enabling students to design more precise experiments, identify patterns, and draw scientific conclusions, enriching their understanding of agricultural principles. Service Learning projects also gain from AI's capabilities, as it can identify community needs, suggest impactful projects, and assist with planning, budgeting, and ensuring these initiatives are well-executed and sustainable.

FFA

With AI proving its value in the classroom and enhancing the management of SAEs, it is only natural to explore its potential in another critical component of agricultural education: FFA. One of the most exciting applications of AI is FFA. The creation of virtual coaches can offer personalized feedback on leadership skills such as public speaking, decision-making, and conflict resolution. These AI-driven coaches simulate real-life scenarios, allowing students to practice and refine their abilities. For instance, Sherpa Labs, an AI platform, has been invaluable for coaching students in agriscience fair projects and CDEs. By uploading a "prompt"—whether it

is a student's agriscience paper, proficiency application, or a job description for mock interviews—Sherpa Labs generates customized questions and provides targeted feedback, grading responses, and identifying areas for improvement. Otter.ai seamlessly captures Zoom meetings and summarizes transcripts, making it an extremely useful tool for qualitative research projects by providing accurate, searchable records and concise summaries of discussions.

Managing written content from students is another area where AI proves its worth. In programs heavily involved with agriscience research, reviewing papers can be particularly time-consuming. Tools such as Brisk streamline this process by automatically assessing gram-



This blend of tradition and technology is helping prepare students for tomorrow's challenges today.

mar, structure, and content quality; providing constructive feedback; and highlighting areas where students need support. This helps maintain high standards for written work and frees up valuable time to focus on other critical aspects of being an FFA advisor.

Customized study plans for CDEs are yet another area where AI shines. By analyzing a student's strengths and weaknesses, AI can develop personalized study plans that focus on the areas needing the most improvement. AI tools can even simulate environments for hands-on preparation, creating scenarios or mock questions to help students practice in a risk-free setting. For instance, Gemini (formerly Bard) can generate detailed study resources and timelines, quickly

creating scenarios for CDEs such as Food Science.

AI can also play a significant role in enhancing community engagement within FFA. By automating various tasks and offering actionable insights, AI tools such as ChatGPT can craft engaging social media posts to highlight student achievements, promote events, and share stories that resonate with the local community. AI can brainstorm innovative ways to engage the community such as organizing garden projects or partnering with local farms. AI can also help plan and organize events such as chapter banquets or service projects by creating timelines to ensure everything runs smoothly. By analyzing fundraiser data, AI identifies successful initiatives and suggests improvements for future

campaigns, helping to maximize fundraising efforts. With these capabilities, AI empowers FFA chapters to foster stronger community ties and enhance their overall impact.

Summary

In a rapidly evolving educational landscape, AI offers transformative possibilities for SBAE, enhancing how we teach, manage, and engage students across the three core components: Classroom Instruction, SAEs, and FFA. From streamlining lesson planning and providing real-time feedback on student projects to personalizing leadership training and automating community engagement tasks, AI empowers educators to focus on what truly matters—mentoring and inspiring the next generation of agricultural leaders. By embracing AI, educators can reduce burnout, enhance student learning, and create more dynamic and sustainable educational environments.

While we might have had a little help from AI typing this article, rest assured that it comes from the combined experience and

passion of three educators who have discovered firsthand that AI is not just a buzzword. It is the key to a more dynamic, sustainable, and empowered approach to teaching. As we continue to integrate AI into our work, we are not just making our jobs easier—we are transforming the future of agricultural education for both ourselves and our students. And that is a reality worth embracing.

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Ms. Lori Romie: A dedicated 7-year educator and advisor for grades 7-12 at Ridgemont Schools in Mt. Victory, Ohio, Lori embraces new things and challenges to inspire and empower students.



Dr. Stephanie Jolliff: A 28-year veteran SBAE teacher at the Ridgemont Ag Ed Program in Ohio, is a proud mother of three FFA members and has guided her students to over 90 national FFA SAE and science fair finalists, earning three National Chapter Models of Innovation.



Mr. Caleb Hickman: Hailing from central Ohio with a family history rich in school-based agricultural education, Caleb is a third-year agriculture educator at Utica Middle and High School in Utica, Ohio.



Dr. Kellie Claflin: An assistant professor of agriscience education at The Ohio State University, with a background in teaching middle and high school agriculture in Wisconsin and a focus on preparing and supporting agriscience educators through her research and teaching.

Lori, Stephanie, and Caleb are currently serving as National FFA Teacher Ambassadors for Ohio.

AI Tools to Better Serve Students with Special Needs in Agriculture Classes

by Dr. Tyler Granberry

Agriculture teachers are expected to be proficient in a wide variety of areas to effectively teach students in their programs. An area many teachers struggle with beyond content knowledge of agriculture is ensuring they are meeting the specific needs of students who require educational accommodations or modifications in their classes (Ramage et al., 2022). Ensuring that success in agriculture classes is accessible for all students is critical to developing the next generation of agriculturally literate citizens. However, the unfortunate reality is that meeting the needs of students with individualized instruction plans (IEPs) or 504 plans can often be difficult, especially for new teachers with limited training in special education (Ramage et al., 2021). Although there are measures in place to aid teachers in meeting the needs of all students, the diverse time commitments agriculture teachers experience, and the uniqueness of agriculture curriculum can often leave them in need of additional time and curriculum resources in order to maximize inclusion for students in their classes.

Fortunately for teachers and students, recent developments in generative artificial intelligence (AI) have given rise to several educational tools that can be useful in meeting the accommodation and modification needs of students in agriculture classes. In the following sections, I will discuss a small number of free, AI-powered

tools I have discovered and how I best envision them being used in agriculture classes. Although this list is not all-encompassing, I hope it provides an entry point for agriculture teachers who are interested in uncovering how AI can benefit them and their students, starting with those who have the greatest educational needs.

Goblin Tools

The first set of helpful tools is a suite of AI-powered resources targeted at students who are

Ensuring that success in agriculture classes is accessible for all students is critical to developing the next generation of agriculturally literate citizens.

neurodivergent. Goblin Tools (<https://goblin.tools>) offers seven free web-based resources; however, I will focus on three I believe will have the greatest impact for students in agriculture classes.

Magic ToDo

Breaking down complex tasks into accessible steps can be a major benefit for students who struggle with the ability to follow multi-step processes. Magic ToDo is a task-breakdown tool that uses AI to analyze a task input and subdivide that task into individual steps. The level of detail in the breakdown of steps can be adjusted as needed to fit the needs of individual students. Because of the highly technical nature of many skills in agriculture classes, teachers can use Magic ToDo to

prepare additional resources for students who may need to see steps written out. Additionally, students who often struggle knowing where to start or what to do next when given a broad topic or abstract project instructions may benefit from learning how to access and use Magic ToDo on their own to avoid getting stuck.

The Professor

The next resource in the Goblin Tools toolkit is designed to help provide concise explanations of complex topics. The Professor can offer explanations and examples based on terms or phrases the user inputs. As with many of the other Goblin Tools, the level of simplicity of the explanation and examples can be adjusted to fit

the student's needs. It is not uncommon for a list of definitions of complex terms to be included as a requested resource for students with IEPs or 504 plans. However, teachers can quickly compile simple definitions and examples of agricultural terminology using The Professor to help students better understand the materials. Additionally, many students with special needs related to reading comprehension have been taught to note words or phrases they don't understand. If they are shown how to input these terms or phrases into The Professor, it may aid their reading comprehension while also allowing them to work independently. Due to the frequency of agricultural industry jargon when discussing



goblin.tools

Diffit

For Teachers

(TOP) *Goblin Tools is a set of AI-powered resources for people with neurodiversity.*

(BOTTOM) *Diffit is an AI tool designed to help teachers create differentiated resources.*

specific topics, this tool may also be helpful for students who do not have specific accommodation needs but still need extra help in deciphering the vocabulary demands associated with agricultural careers or topics.

Formalizer

Another Goblin Tools resource that may benefit agriculture students with special needs is Formalizer, which is designed to help revise text based on the user's needs or intent for how they want their writing to sound. Students who struggle with coherent extended writing may find Formalizer to be a helpful tool that allows them to input very rough drafts of text and request that the tool convert the text to a different tone, structure, or grammatically correct version. Formalizer is particularly useful for students who can verbalize what they want to say but have difficulty translating that into clear, concise writing. This can be useful in agriculture classes when teaching students how to create professional writing as a career skill such as cover letters, resumes, and emails. Alternatively, teachers can use this tool to convert complex text into easier-to-read or bullet-point versions for students who require simplified text as a modification.

An interesting feature that makes these three Goblin Tools resources particularly useful is that they can all be customized to the student's needs using a sliding scale, represented as a "spiciness level." Although

changes in level create different results for each tool, the ability to make these changes reflects a possibility of differentiation across several students' needs. Additionally, all text inputs for any of the Goblin Tools can be recorded through a device's built-in microphone instead of typed. This feature is especially helpful for students who struggle typing words or phrases.

Perplexity

Currently, several AI-powered chatbots are available for free public use. However, a primary concern is the accuracy of the information they provide and where they source it. Perplexity (perplexity.ai) is a chatbot that allows users to access information conversationally, focusing on up-to-date facts. The primary feature that sets Perplexity apart from several other chatbots is that it cites sources for the information it provides to the user. A common practice in modern agriculture classes is to have students research a topic and present their findings. Although beneficial for developing critical thinking skills, this assignment may be difficult for students with special needs. However, by using Perplexity, students will have access to concise, conversational answers to questions that they have with resources that may guide them more accurately than a standard internet search. This may also be helpful for students who have a difficult time assessing the quality of resources

from which they derive information about agriculture, contributing to agricultural literacy.

Summarize.tech

Videos have become a standard resource in agriculture classes, and teachers have a nearly endless source of educational content to help students understand agricultural topics. However, for students with auditory processing disorders or neurodivergence, watching a video on a streaming platform as an educational tool may pose a greater challenge than for other students. A request for transcripts or notes to accompany videos is a common accommodation request but may be difficult to generate for teachers who are already in a time crunch. Summarize.tech is a web-based tool that uses AI to generate written summaries of YouTube videos. Creating the summary is very simple and only requires the video's URL. For teachers who are trying to accommodate students who need written notes from a video, this can be a major time-saver.

Diffit

For the past several years, differentiation has been a key concept in effective inclusion for students with special needs. However, adjusting resources to meet the needs of all students in an agriculture class can be difficult, particularly when teaching highly technical content. One AI-powered alternative to spending additional hours recreating curriculum resources is Diffit

(app.diffit.me). Diffit is a resource generation tool for teachers to help create curriculum resources on a topic adjusted to any reading level from 2nd to 11th grade. This can allow teachers to differentiate their materials to a much wider range of student abilities than would traditionally be possible. Additionally, Diffit can generate materials in a wide range of languages, making it an excellent tool for creating resources for students who are new to learning the English language. Diffit does require an account to use and has a paid premium option; however, there is a free version for teachers that provides access to many helpful resource-creation tools.

Although using AI in agriculture classrooms can seem like a daunting task reserved for only the most tech-savvy among us, it is important to remember that AI is continually becoming easier to use and improving the ease of tasks that previously may have been quite difficult. Recent research has shown that agriculture teachers would like specific resources to help them better serve the students with special needs in their classrooms (Ramage et al., 2021; Ramage et al., 2022). Although AI resources are not a substitute for high-quality training that focuses on specific types of student needs, they can provide an avenue to make things easier and more accessible for teachers and the students they serve. Making agricultural education accessible for all students is a goal to which agriculture teachers across the nation aspire. Using

innovative approaches such as AI-powered tools makes reaching that goal a little more attainable.

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Dr. Tyler Granberry is an Assistant Professor of Agricultural Education at the University of Tennessee.

Enhancing Agricultural Education with AI Technology

by Hailey Browning Lacour, Carter Burgin, Randy Lund, & Jason B. Peake

Recent years have seen agricultural education grappling with critical challenges such as a severe shortage of qualified educators and escalating burnout rates (Smith, Lawver, & Foster, 2017). Agricultural, Food, and Natural Resources (AFNR) educators are often stretched thin, balancing a wide range of responsibilities—from classroom teaching to overseeing Supervised Agricultural Experiences (SAEs) and managing FFA activities. These demands make it challenging for educators to maintain the needed balance among the many responsibilities.

Artificial intelligence (AI) presents a potential solution to addressing these pressing challenges. Artificial Intelligence will likely never replace educators. However, what if a shift in perspective allowed educators to embrace AI? When thoughtfully integrated into the classroom, AI has the potential to revolutionize AFNR education by addressing key issues like teacher burnout and administrative overload. We are not suggesting AI replace educators. Empathy, sympathy, and other human emotions are critical characteristics of effective teaching (Fitria, 2023). Rather than replacing educators, AI can enhance their capabilities and alleviate the burdens contributing to burnout. By automating routine tasks, providing real-time feedback, and enabling personalized learning strategies,

AI helps educators focus on what matters most: teaching and mentoring students.

Alleviating Stress and Burnout

AI integration can significantly alleviate stress and burnout by automating routine tasks such as grading assignments, scheduling, and tracking student progress. AI-driven tools can quickly assess tests, analyze responses, and provide feedback, saving

their teaching methods to remain relevant. AI-powered platforms can analyze vast amounts of educational content and suggest creative lesson plans, activities, and instructional strategies that align with current trends and student interests. For example, AI can recommend interactive digital tools or simulations to demonstrate complex agricultural processes, making learning more accessible for students. This approach helps maintain student engagement

and empowers educators to continually refine their practices, ensuring their methods remain effective and inspiring.

AI can personalize learning by analyzing student performance data,

By reducing administrative tasks, AI enables educators to focus on innovative teaching methods, increasing student engagement, and fostering a strong classroom community.

educators valuable time for more meaningful student interactions. Additionally, AI can streamline lesson planning by suggesting resources and creating personalized learning paths based on individual student needs, ensuring effective support and differentiation. By offloading these tasks, educators can focus on building relationships, reducing burnout, and enhancing job satisfaction through a more rewarding and fulfilling teaching experience.

Enhancing Classroom Innovation

Additionally, AI can assist educators in generating fresh, innovative ideas for teaching familiar topics. In a rapidly changing world, educators need to adapt

providing real-time feedback, and identifying areas needing support or enrichment, allowing educators to offer more targeted instruction. Student achievement significantly improves when AFNR educators skillfully integrate cross-curricular strategies (Clark et al., 2013). By reducing administrative tasks, AI enables educators to focus on innovative teaching methods, increasing student engagement, and fostering a strong classroom community. Additionally, AI-powered simulations can bridge the gap between classroom learning and real-world applications, helping students practice decision-making in risk-free environments to prepare them for the complexities of the agricultural industry.

Supporting Supervised Agricultural Experiences (SAEs)

Supervised Agricultural Experiences (SAEs) are a cornerstone of AFNR education, offering hands-on learning opportunities crucial for student development. However, managing these experiences can be challenging. Teachers should embrace the power of AI to revolutionize SAE projects by guiding students to explore innovative, non-traditional pathways beyond market animals. This will help unlock their full potential and expand the horizons of agricultural education. This streamlined approach enhances the quality of SAE programs while reducing the administrative burden on educators. AI can also use data analytics to monitor various metrics related to students' agricultural projects, such as growth rates in plant science experiments or animal health in livestock management. Educators can then use this data to provide targeted feedback and support, helping students to troubleshoot issues and optimize their efforts.

Additionally, AI can facilitate communication and collaboration among students, educators, and industry mentors involved

in SAEs. AI-driven platforms can host virtual meetings, manage project timelines, and track milestones, ensuring all stakeholders are aligned and informed throughout the process. By enhancing coordination and oversight, AI enables educators to focus on mentoring and supporting students rather than spending extensive time managing logistics.

Streamlining FFA Tasks with AI

In the face of AFNR educator shortages and burnout, AI emerges as a powerful ally in advising and managing FFA chapters. By integrating AI into the training process, educators can unlock new potential in preparing Leadership Development Event (LDE), Career Development Event (CDE), and Speaking Development Event (SDE) teams. For instance, AI can generate customized practice problems for Parliamentary Procedure (Chapter Conducting) teams, simulate real-life agricultural scenarios for the Agricultural Technology and Mechanical Systems CDE, or create tailored questions for Creed Speaking and Prepared Public Speaking events. This allows students to engage in

rigorous and targeted preparation that mirrors the complexities they will face in competitions, ensuring they are well-equipped to excel.

This innovative use of AI enables educators to streamline the coaching process, significantly reducing the time and effort required to prepare students while maintaining high standards of excellence. With AI handling tasks like generating scenario-based questions for Agricultural Sales or generating questions for the Farm Business Management contest, advisors can focus more on mentorship and guidance, enhancing the overall performance of their FFA chapter. By embracing AI, FFA programs can become more dynamic and successful, offering students a richer and more fulfilling experience that extends beyond traditional preparation methods.

The Role of AI in Personalized Learning

AI's potential to personalize learning is one of its most promising features. Personalized instruction is key to effective teaching in agricultural education, where students may have diverse interests and learning needs. AI can enhance personalized learning by providing insights into each student's strengths and weaknesses, allowing educators to effectively tailor their instruction. For example, AI algorithms can analyze student performance data to identify areas where individual students may need additional support or enrichment. This data-driven approach enables educators to create customized learning paths for their students, ensuring each learner receives the attention and resources needed to succeed. AI can offer real-time feedback on student work, providing immediate insights that help students understand where to improve.



AI tools can enhance collaboration and empower educators, fostering a more efficient and engaging learning environment.

This instant feedback loop can be particularly beneficial in hands-on disciplines like agricultural mechanics or animal science, where skills are developed through practice and repetition. AI supports a more dynamic and responsive learning environment by giving students the feedback they need to improve quickly.

Crafting Effective and Efficient Prompts

Agricultural educators can enhance the effectiveness of AI-generated content by crafting prompts that are precise, contextual, and aligned with educational objectives. It is essential to clearly define the scope of the task, specifying the key concepts or topics that the AI should address. For instance, instead of a broad prompt like "Create a lesson plan for soil health," a more effective prompt would be "Create a lesson plan, using the 5E model. The lesson plan is for students in grades 11 and 12. Include objectives that contain audience, behavior, criteria, and condition. The lesson topic is the role of organic matter in improving soil structure and water retention in sustainable agriculture practices." Additionally, providing context, such as the target audience (e.g., high school students or industry professionals), ensures that the AI tailors the response appropriately. Including explicit instructions on the format, tone, and depth of the response further refines the output, allowing educators to obtain content that fits seamlessly into their curriculum. AFNR educators should experiment with iterative prompts, refining their initial input based on the AI's response to achieve increasingly accurate and relevant content. By employing these techniques, agriculture educators can maximize the utility of AI platforms in enhancing student learning outcomes. Breezy TA is an AI platform designed for educators,

offering over 30 unique tools that simplify content creation and classroom management, reducing the need for elaborate prompts and saving AFNR educators' valuable time.

Embracing AI as a Partner in Education

Although the integration of AI in agricultural education is still in its early stages, it has already demonstrated considerable potential. As technology evolves, AI tools will become even more sophisticated and accessible, offering new ways to enhance teaching and learning. The key is to embrace AI as a partner in education—one that empowers educators and enriches the student experience. As AI becomes an integral part of the educational landscape, AFNR educators have an unprecedented opportunity to transform their classrooms and inspire the next generation of agricultural leaders. AI offers a promising solution to some of the most pressing challenges faced by AFNR educators today, from streamlining administrative tasks and reducing workload to providing personalized learning experiences and fostering a more dynamic classroom environment. By adopting AI, educators can enhance their instructional methods, improve student engagement, and ensure each learner's needs are met. This forward-thinking approach will enable educators to focus on what they do best: inspiring and guiding their students to become future leaders in agriculture. AI can bridge gaps, offer innovative teaching strategies, and ultimately transform agricultural education, ensuring that educators and students thrive in a rapidly changing world.

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Breezy TA: Your Classroom, Elevated by AI

by Dr. Randy Lund

In the ever-evolving world of education, finding ways to save time while maintaining high-quality instruction is a challenge every teacher faces. The workload can be particularly demanding for agricultural teachers, balancing classroom teaching, hands-on labs, FFA activities, and community involvement. Breezy TA is a revolutionary platform designed to alleviate the burden on teachers by harnessing the power of artificial intelligence. Breezy TA is more than just a tool; it's a comprehensive platform boasting over 20 tools tailored specifically for teachers.

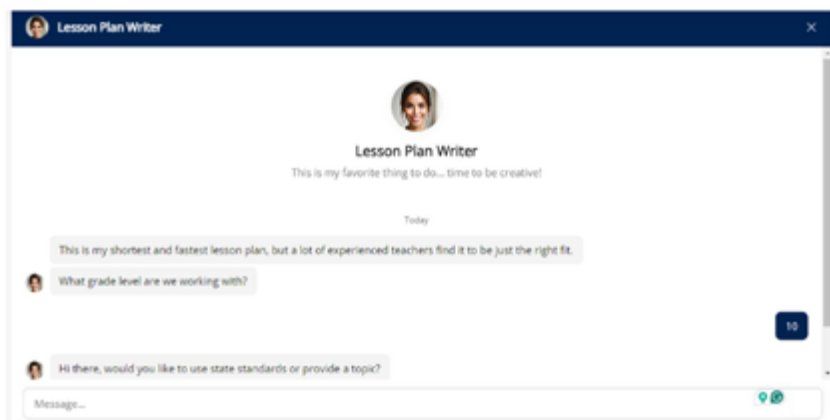
Unlock the Power of Breezy TA in Your Classroom

One of the standout features of Breezy TA is its versatility. With a range of tools designed to address various aspects of teaching, the platform can adapt to the unique needs of any agriculture classroom. Here's a look at some of the key features that make Breezy TA a must-have for today's teachers:

1. **Create Engaging and Targeted Lesson Plans:** Breezy TA's lesson planning tool is a game-changer. By inputting basic information about your course and objectives, the platform generates detailed lesson plans that are not only aligned with curriculum standards but are also designed to captivate students' interest. This feature allows teachers to spend less time on preparation and more time focusing on student interactions and hands-on learning experiences.
2. **Differentiate Lesson Material:** Meeting the diverse needs of students is essential, and Breezy TA makes this easier by offering tools to differentiate lesson materials. The platform can modify content to suit different learning levels, ensuring all students are challenged appropriately. Whether you need to simplify complex concepts or provide additional challenges for advanced learners, Breezy TA has you covered.
3. **Generate Automated Assignment Feedback:** Grading can be one of the most time-consuming aspects of teaching. Breezy TA's automated grading tool saves time and generates detailed, personalized feedback for students. This instant feedback helps students understand their mistakes and learn from them, promoting continuous improvement.
4. **Plan for Engaging Group Work in the Classroom:** Collaborative learning is a powerful tool, and Breezy TA helps teachers plan engaging group activities. The platform suggests structured group work plans that promote teamwork, critical thinking, and hands-on learning, making incorporating these valuable experiences into your lessons a breeze.

(LEFT) Simplify Your Teaching, Maximize Your Impact!

(RIGHT) Breezy TA crafts custom lesson plans in a snap, giving teachers more time and less stress!



5. **Generate Authentic Assessments:** Assessing students' understanding through authentic assessments is vital to measuring the real-world application of knowledge. Breezy TA assists in creating assessments beyond traditional tests and quizzes, offering project-based evaluations, performance tasks, and other forms of authentic assessment that reflect students' practical skills and understanding.

Ready... set... AI

Breezy TA offers a lifeline in a profession where time is always in short supply. By automating routine tasks, enhancing instructional materials, and supporting professional growth, Breezy TA empowers agricultural educators to be more effective and efficient. Breezy TA is an invaluable resource worth exploring for those looking to innovate in their classrooms without sacrificing quality.



Hailey Browning Lacour is a Ph.D. student in the Department of Agricultural Leadership, Education, and Communications at Texas A&M University.



Carter Burgin is a master's student in the Department of Agricultural Leadership, Education, and Communications at Texas A&M University, pursuing a career in Secondary Agricultural Education.



Randy Lund is an Instructional Assistant Professor in the Department of Agricultural Leadership, Education, and Communications at Texas A&M University.



Jason B. Peake is an Associate Professor within the Department of Agricultural Leadership, Education, and Communication and a program leader for Agricultural Education at the University of Georgia.

Working Smarter Not Harder With AI

by Joe Ramstad & Dr. Scott Smalley

In 2016, the average secondary agricultural education teacher reported working a staggering 55 hours per week (Sorensen et al., 2016). Whether it be teaching students in one of several preps, managing facilities, advising FFA activities, conducting SAE visits, or attending professional development, the plate of an agricultural education teacher always seems to be full. Fortunately, some recent advances in technology can hopefully create more space on the agricultural educator's plate; this technology is artificial intelligence (AI).

The Pew Research Center found 53% of people believe the development of AI is causing more harm than good (Tyson & Kikuchi, 2023). However, in agricultural education, AI can be a useful tool for generating ideas; developing student pre-lab readings; providing outlines for lessons, units, or even full courses; or facilitating student activities.

In this article, we will explore a few key tools available for agricultural educators, provide a couple of helpful strategies for using AI, and share some specific applications to classroom, FFA, SAE, and program development. As with any technology, it is important to recognize that these AI tools are just that, tools, and they are not perfect—always be sure to carefully review any AI-generated text and use it as the starting point to develop your final product. Additionally, these tools should always be used appropriately and ethically—never provide any personal or student information and always be sure to acknowledge the use of AI.

Key Tools

Two key AI tools are ChatGPT and MagicSchool AI, both of which are available free of charge to educators. ChatGPT is useful for quick write-ups, such as social media posts or even review questions, and it can even help with writing lesson plans or course

maps. MagicSchool AI is similar to ChatGPT, but provides users with a variety of more education-specific tools ranging from rubric generators to movie worksheet creators and much more. While ChatGPT is formatted as a text box where you simply input what you are wanting the bot to develop, when you create an account with MagicSchool AI and login for the first time, you will see a variety of different icons where you can try many of the strategies shared below.

Key Strategies

While working with any AI tool, there are a few valuable strategies you can use in your input to ensure you have the best output. Some of these strategies include:

- **BE SPECIFIC:** Include as many details as necessary in your AI message. For example, if you are asking for AI to write a multiple-choice quiz, include an overview of topics, the number of questions desired, the number of choices

(LEFT) Artificial intelligence has many applications within planning and designing instruction.

(RIGHT) Students can utilize AI platforms to develop and refine content as part of class activities.



needed per question, and the difficulty level. You can also ask AI to make modifications based on student grade levels so feel free to experiment with that also.

- **PROVIDE EXAMPLES:** If you are worried about your input being too specific, provide a couple of examples for the AI to better understand what you are looking for.
- **BE NICE:** This one may seem a little weird, but it actually works. Wishing your AI tool a good morning at the beginning of your input, and using words such as “please” and “thank you” will generally create a better output.

Key Applications

Utilizing these key tools and strategies presents us with the opportunity to check specific items off of our teacher to-do lists. A few of the most helpful ways we can use AI are provided below.

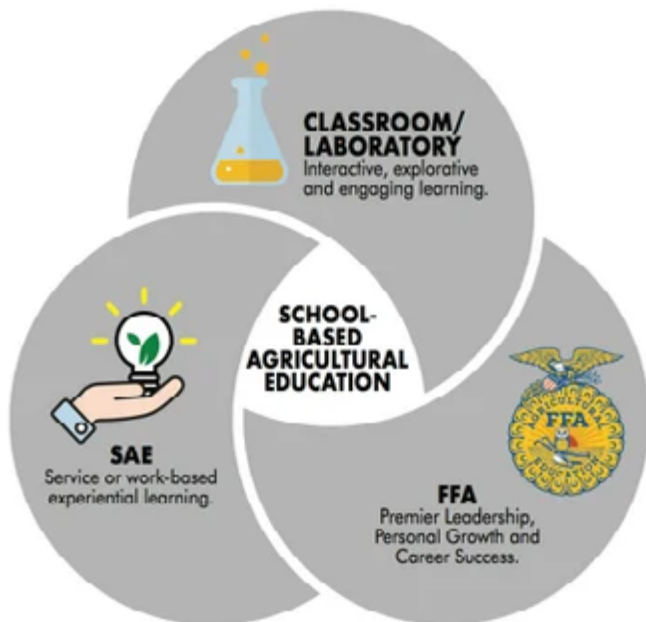
Classroom

- **LESSON, UNIT, AND COURSE PLANS:** Stuck on what to teach for a specific class? Both AI tools provide you with the opportunity to write out detailed plans for lessons, units, or even whole courses. You can even ask AI for ideas

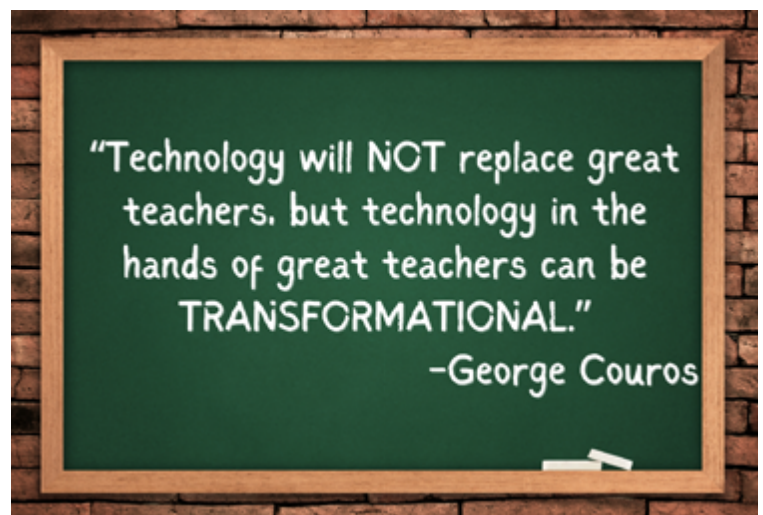
on assessment, daily warm-ups, and more to take some of the planning stress off your plate. The best part is that you can supplement AI’s ideas with your own labs or supplemental materials that you like to use.

- **EVALUATING ACCURACY OF TEXT ACTIVITY:** AI is not perfect, and you should always read what AI generates before providing it to your students. However, one specific activity is to have your students enter a specific prompt within AI and have it generate a certain number of words about that topic. Then you can have your students make the generated text better or more correct. For example, at the end of a unit, a student could input “Good morning! Please provide me with a 500-word essay about the processing of ice cream.” After AI generates the text, the students then go through and make edits or enhancements to make the AI-generated text better. There are bound to be a few technical mistakes or areas the AI bots could go more in-depth, so this provides for a great opportunity for students to build their reading and editing skills while reinforcing their content knowledge.

- **MOVIE WORKSHEET GENERATOR:** Are you stuck at home with a cold, or do you need to quickly develop a class sub plan? If so, MagicSchool AI will allow you to provide a link to an online video, and it will generate a worksheet and corresponding answer key for you to use.
- **RUBRIC DEVELOPMENT:** On MagicSchool AI, you are able to develop a rubric using various point values or evaluation criteria. It provides you with criteria for different levels of performance you can use to evaluate a variety of summative assessments. Be specific on the types of areas you hope to evaluate such as neatness, creativity, and content knowledge.
- **ASSESSMENT OR REVIEW QUESTIONS:** On both AI platforms, you can provide a list of unit objectives or topics and develop assessment questions using a variety of different formats including short answer, calculation or problem solving, multiple-choice, essay, and true or false. You are then able to modify those questions and use them on assessments or as the basis for in-class review games.



(LEFT) AI can have positive implications in each of the three components of agricultural education.



FFA/SAE

- **CDE/LDE PROMPTS AND INTERVIEW QUESTIONS:** Similar to writing assessment questions, AI tools can provide you with the opportunity to write prompts for different CDE or LDE competitions or questions for leadership interviews.
- **BANQUET OR EVENT SCRIPTS:** If your students are struggling to develop a comprehensive banquet script or any other type of event script, they can always turn to AI to at least get a start. ChatGPT can create starting points for event scripts that can be easily customized with student or award names. This especially comes in handy in the spring when the to-do list seems extra long.
- **TEAM BUILDING ACTIVITIES:** If you are struggling to come up with engaging activities for your FFA officer retreat or even the first day of school, both AI tools can help you out as long as you know the general point of the activity you are looking for (e.g., teamwork, leadership, and communication).
- **TRIP PLANNING:** Do you need inspiration to plan tours

or activities for FFA members to do on the long road trip to state or national convention? Ask AI to help you develop an itinerary, and you can even specify a budget or special points of interest.

Program

- **SOCIAL MEDIA AND MARKETING POSTS:** Writing posts to promote your program can be time consuming for you and your chapter reporter. AI tools can provide you with some inspiration and help you get started with developing individual posts or even a comprehensive social media calendar.
- **GRAPHIC DESIGN AI TOOLS ON CANVA:** While this specific tool is not ChatGPT or MagicSchool, Canva is a helpful graphic design tool that also has AI capabilities. Use it to develop starting points for appealing graphics for social media, slideshows, or even your chapter website and leave the creative brain power up to the AI bots.

While AI may not be at the point to take everything off of our plates – and could never replace the knowledge or expertise of an

agricultural educator – it sure is a great starting point that can help us work smarter not harder, and maybe even shave a couple of hours off the 55 hours the average educator spends at school each week. As AI tools continue to develop and be refined each day, consider the ways you can utilize AI in your program, and be on the lookout for new ways it can save you some time.

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Joe Ramstad is a graduate assistant and Ph.D. student at Iowa State University's Department of Agricultural Education and Studies (ramstad@iastate.edu)



Dr. Scott Smalley is an associate professor at Iowa State University's Department of Agricultural Education and Studies (smalle16@iastate.edu)

From Crickets to Conversations: How AI can Spark Student Engagement

by Trent Van Leuve

After one of those common agriculture teacher meetings, an alumni member introduced me to the recently released ChatGPT. I was astounded. I quickly went home and created an account to test out its capabilities. Immediately, I knew this would impact education and the possibilities for instructors and teachers were going to expand. With this newfound knowledge, I volunteered to showcase these AI tools at the next teacher in-service. My peers were equally impressed by the demonstration—so much so that ChatGPT was immediately blocked for students the following week. My experiences using artificial intelligence tools have brought some improvements to my instruction.

Generating Ideas

Fast forward a couple of months to a chapter officer retreat. Officers had received some instruction on creating a program of activities, had generated some activity ideas, and now it was time to put together some action plans. *Cue the sound of crickets chirping.* The activity ideas came quickly, but when it came to outlining the action plan, progress stalled. I entered the prompt into ChatGPT: “Generate an action plan to make metal flags to mark fire hydrants for deep snow in our town.” A quick, thorough action plan was generated. This plan was not perfect, but it sparked a great conversation about adapting it to our chapter and community needs. What would have taken twenty minutes of brainstorming was condensed down to three

minutes. Using ChatGPT in this way led to better discussions that helped students understand the steps involved in creating action plans. Often, the most daunting challenge of a task is figuring

out how to start. AI resources can “prime the pump” and help create a better flow of creativity. After tailoring these large action plans for our chapter and community and incorporating the chapter’s specific needs, the final action plans did not resemble those generated by ChatGPT.

If you google “FFA activity example,” the first example that might appear is a plan for a 5K run/walk from ffa.org. If you enter the prompt “Create an action plan for my FFA chapter to conduct a 5K run/walk this fall” into ChatGPT, it may generate a 750-word action plan, as it did for me. The action plan may include suggestions such as “choosing a date that does not conflict with other local events” and other items you might not have considered. For example, runners wear “race bibs” with numbers, and one needs to consider permits, timing equipment, post-race refreshments and entertainment, sponsors, race packets with promotional materials, a volunteer coordinator (perhaps an alumnus), and a suggested calendar for task completion. Previously, an agriculture teacher would have spent an hour discussing this with another



As educators, our challenge will be to keep up so we can help guide how it will shape education for the benefit of all.

Students with their sign that was developed with the help of AI.

teacher who had organized a 5K in the past. Now, the same conversation is better guided, uncovering the nuances of conducting a first-time chapter 5K.

One common concern about using AI tools is the fear students will use these resources to complete their assignments for them. I have found being proactive by scaffolding assignments—creating outlines, requiring research templates, having students submit each section, and working on the introduction last—produces great essays. Generative AI models like ChatGPT have been excellent for providing more effective “peer reviews” than classmates can. After spending weeks on essays—a challenging task for both students and teachers—I started wondering how we would have time left for students to write speeches later in the year. The best use of ChatGPT for this assignment was teaching students to write prompts to reformat their pre-existing essays into speeches

that met assignment criteria. I generated those speeches from their prompts—they had one shot—and the speech was shared with them for further editing. Students then had to ensure the speeches were the correct length and incorporated literary devices. This experience illustrates some possibilities as we consider the ethical use of AI in education.

Using AI for Ag Mechanics Projects

Generative AI has been a huge boon to my shop classes as we work with the CNC plasma table. Our mascot is a miner, which, with a cowboy hat, resembles a prospector—acknowledging our ranching community and the fact that the local mine has been closed for half a century. My students and I have tried to find a miner or prospector silhouette without a hard hat but have struggled to find one suitable for tracing in Inkscape, a vector graphics editor. The paid version

of ChatGPT-4.0 can generate a near cut-ready image. We ran the prompt “Create a silhouette of an older miner sporting a beard in a cowboy hat with a pick that can be cut out of metal with a CNC plasma table,” and we were rewarded with a great image. For some reason, it kept generating a headlamp on the cowboy hat. When asked to remove the headlamp, it generated another image with a headlamp. Nevertheless, it was not hard to paste the image into Inkscape, trace the bitmap, and delete enough nodes to make the headlamp disappear. We then merged this image with a rounded rectangle, differenced another rectangle out of its center and unioned the words “Agriculture Education,” and cut it out on the CNC table. After sanding, the silhouette was painted black, the letters red, and an additional back piece was painted white—to make the silhouette pop. The layers were joined with 3M double-sided

(LEFT) Prompt: Create a silhouette for a CNC plasma table of a cowboy riding a bucking horse while holding a miner's pick and give him a beard.

(RIGHT) A rough draft generated from ChatGPT. Note that the O center will fall out. A quick strawman for a client.”



automotive tape and both layers screwed onto the shop's outer wall. Finally, after 37 years, we have a sign on the building—no more questions about which building is the Ag Shop. Students are excited about incorporating AI to generate high-quality silhouettes for cutting out signs.

When generating silhouettes, I have found ChatGPT occasionally needs a reminder that “their image has too many parts falling out.” This quick re-grounding to the original prompt usually results in the desired silhouette. I have also noticed repeatedly adding to the prompt can diminish image quality for tracing, so it is often better to regenerate from a completely revised prompt.

Artificial intelligence can be employed to serve customers better for CNC plasma or laser work. Many times, a community member will approach me asking if “any of your students need a project.” They often want a custom sign, but only have a vague idea of what they want and limited understanding of the equipment's capabilities. Working with community members typically involves students trying to capture their vague vision, resulting in numerous, time-consuming edits. This type of work can leave students frustrated, and the teacher often must mediate between the student and client – enter AI generators. These tools can create a strawman concept within a minute for the client to critique and refine. This helps the client, teacher, and student

quickly collaborate on a project—sometimes knowing the customer might not even have it cut out when they see the cost. AI-assisted collaborations often exceed the original vision, with projects occasionally incorporating some AI-generated art but more frequently providing a template for students to follow to meet the client's goals. Previously, students who have spent weeks working on a customer project find themselves looking around nervously when I announce, “Is there anybody who wants to volunteer to work on a project for_____.” With these AI tools trimming down the back and forth of revisions, I expect to see students more enthusiastic when working with community members on projects.

As I finished drafting this article, I fed it into a prompt for edits and suggestions. Though it identified some of my shortcomings in writing, it also suggested some changes that demonstrate its lack of a soul and knowledge of real-world scenarios. As I work with students, I try to make sure they understand that AI, though it is a time saving technology, requires knowledge and skill to really employ this technology in order to create content that rises above what others can create with the technology. I hope the use of AI technology will take the place of some of the time-consuming tasks and create more time for creativity, skill development, and teamwork. Students will be learning the technology faster than most adults will. As

educators, our challenge will be to keep up so we can help guide how it will shape education for the benefit of all.



Trent Van Leuven is an agriculture educator who teaches students in grades 8 through 12 at Mackay Junior-Senior High School in Mackay, Idaho located 100 miles from a traffic light. A graduate of the University of Idaho, he holds a Bachelor of Science in agriculture education. He has been teaching for 15 years, with the last ten years spent in Mackay. He was named Idaho's 2024 Teacher of the Year and has 4 young children with his wife Cara.

AI in the Toolbox: The Agricultural Educator's New Safety Teaching Tool

by Dr. Garrett T. Hancock, Dr. Jason McKibben, & Dr. OP McCubbins

As educators in agricultural mechanics, we've all found ourselves stressing the idea of "Safety First." We do it hoping our students will truly grasp the importance of staying safe in the shop and field. We've all repeated some version of this mantra countless times: "Safety first," "Think Safe," or "The time for safety is before you need it," but how often do we feel like the message really sticks? Despite our best efforts, ensuring that safety becomes second nature to our students remains challenging. With that in mind, what if we could go beyond just telling them about safety or waiting until they are almost in danger to find a teachable moment to really drive the point home? What if we could change how we immerse them in safety?

This is where the possible introduction of Artificial Intelligence (AI) into coursework comes into play. Just a few years ago if you were to read about AI, many of us would imagine the controlling computer Hal from 2001 A Space Odyssey, or K.I.T.T., a snarky Trans AM helping fight crime in the 1980s Knight Rider, or even The Architect from the 2000s Matrix movies. AI isn't just some buzzword or an "evil" essay generator. It's something our industry partners use daily to help make decisions based on past events, predict patterns, and be able to spot differences in things the human eye can't see. New

A teacher explaining the concept of Artificial Intelligence to a student in a workshop.

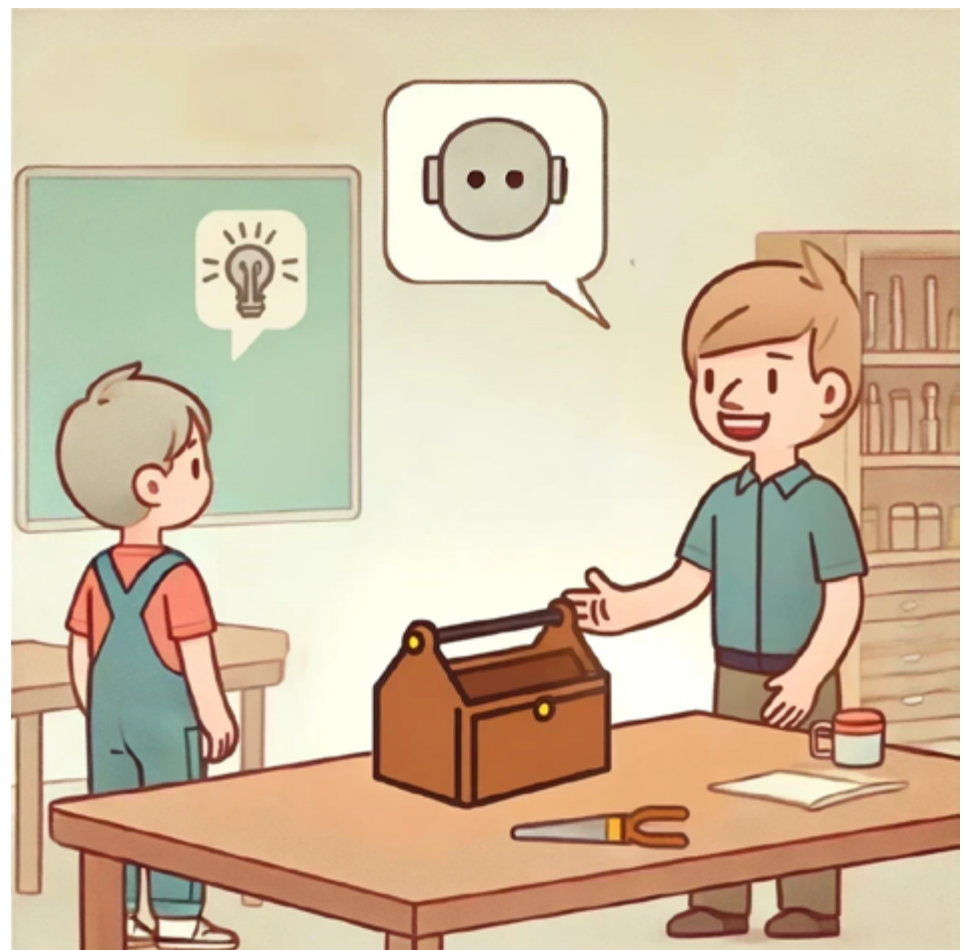
ways to implement this technology are coming out every day. AI is already making waves in our industry, so why not harness it to help our students engage more deeply with safety practices?

Now, let's be honest—AI, as we know it today, is new enough and has way more potential than has yet to be realized. That said, there's no reason we can't start using what's available right now. Imagine giving students feedback that's not only immediate, but also tailored to their specific needs, personalized in a way that helps them internalize safety. Integrating AI into our teaching can make "Safety First"

more than just a phrase. It can become a lived experience for our students.

Adapting AI for the Classroom

As AI continues to find its place in the agricultural educator's toolbox, it is important to see how it can improve safety and manage equipment in the field more efficiently. AI tools aren't futuristic concepts; they are practical solutions that can make a real impact in our classrooms today. Here are three examples of how AI is currently being used and how it could be integrated into your program to benefit both you and your students.



Adaptive Learning: Picture using AI to tailor safety lessons for each student. Platforms such as Smart Sparrow adjust content based on individual performance. Something similar could be adapted for agricultural mechanics, which could lead to more practice on specific safety topics if a student needs it. As students engage with the content, the AI adapts to help them find the right process or answer, ensuring they're prepared before handling real equipment.

AI-Assisted Scheduling: Within the agricultural mechanics lab, keeping the machinery you have in working condition is crucial, but it can be challenging in an active program. That's where tools such as John Deere's Machine Health Monitoring may come into play. This system uses AI to predict when equipment needs maintenance based on how it's being used. For schools with not only shops, but also barns, meat labs, greenhouses, or land labs, similar technology could mean fewer breakdowns and safer equipment. It's a practical way to ensure everything runs smoothly while giving students a taste of real-world maintenance practices.

Immersive Feedback: Instant feedback transforms hands-on learning, and resources such as the VRTEX360 virtual reality welding simulator are a prime example. This teaching and practice tool immerses students in a realistic welding environment, providing real-time (AI-generated) guidance as they practice. By correcting mistakes in a virtual setting, students build confidence and refine their safety skills before ever handling real equipment. It's an effective way to

ensure students are well prepared for real-world welding in a completely safe environment.

Embracing Generative AI as a Tool

As a specific subset of AI, generative AI is what most people are currently discussing. While there are certainly different camps on the use of this tool, generative AI allows educators to create tailored learning experiences that go beyond traditional teaching methods. It can help teachers provide students with personalized and interactive content that adapts to their unique needs and skill levels. Successfully implementing these tools will help students grasp complex concepts more effectively and ensure they devel-

“Successfully implementing these tools will help students grasp complex concepts more effectively and ensure they develop the necessary safety practices before engaging with real-world equipment.”

op the necessary safety practices before engaging with real-world equipment. Here are a few practical ways generative AI can be applied in classrooms to improve the learning environment.

Customized Safety Simulations: Generative AI can create personalized safety simulations that adjust to each student's or class's skill level. By offering hands-on training in a virtual environment, students can gain practical experience without the risks associated with real-world accidents. This approach builds confidence and ensures students are better prepared before they handle machinery.

AI-Generated Safety Content: Another promising application of generative AI is within lesson

planning and content development. It can help with the creation of customized safety tutorials, quizzes, and instructional materials. This content can be tailored to meet specific course objectives, ensuring that it aligns with what students need to learn. By integrating this AI-generated content into the curriculum, instructors can enhance student understanding while removing some content creation burden.

AI-Assisted Feedback and Grading: Generative AI can also provide personalized feedback and assist in grading student work. By analyzing written or recorded performance on tasks such as tool use, equipment maintenance, or safety procedures, AI can generate detailed feedback that

highlights areas of strength and suggests improvements. This tool can ensure that evaluations are consistent and objective, helping to standardize grading across different students' work.

Putting AI into Action: Using generative AI to plan an activity and lesson

Platforms such as ChatGPT can be invaluable for creating realistic and engaging safety scenarios in your agricultural mechanics classroom. In fact, AI can serve as your personal assistant game master (GM), guiding students through hands-on safety exercises. In some ways it is like a role-playing game but grounded in real-world activities. Developing these kinds of engaging and active lessons for your students can be so time-consuming that some of us may never even try. But through the use of AI, you can better utilize your time by allowing the generative nature of the newest AI tools to help you streamline what you already are doing. Let's explore how you



A teacher leading a roll play scenario with the assistance of an artificial intelligence bot.

Example Follow-Up Prompt:

“Let’s follow up by creating a Lack of Safety Glasses situation. In this portion of the scenario, there should be a student who is not using proper PPE. It should be clear who is not wearing their safety glasses properly and what is happening around that student. Let’s explain the situation and provide a prompt to get the student’s thoughts and potential actions regarding this scenario.”

This prompt encourages students to take action and reinforces the importance of safety protocols. It also gives the AI some context into what you are looking for in your scenario. Stay encouraged when the output is different from what you are looking for. Ask follow-up questions and provide feedback to get your scenario to what works best for you. Once you have trained the AI to provide the best product for you, begin exploring the scenario with your new co-GM.

Wrapping Up the Scenario

When implementing game-based learning or scenarios into your coursework, debriefing with your students is crucial. This is where the real learning happens, as students reflect on their actions and decisions. Here is how you can work with your co-GM to build a reflection piece for your scenario.

Example Reflection Prompt:

“Now that we have built our scenario, let’s create a review that covers what happened. Let’s ask questions like: How did you address the safety hazards? What went well, and what could have been done differently? How can these lessons be applied in re-

could use this tool effectively in classroom instruction.

Setting the Stage

Before diving into the scenario, it’s essential to set the stage. Using ChatGPT as your co-GM may take some training to prepare it to create narratives that engage students in learning about safety. The key is to start with a prompt that clearly defines the objective and context of the scenario. The “generative” part of generative AI means that it is continuously learning about you and what you want. So, the more you use it and the more you interact with it, the better it gets at providing you with the help you need.

Example Initial Prompt: *“I am creating my first RPG-like scenario to introduce students to the proper use and safety of power tools in an agricultural mechanics laboratory. I want to present the students with*

a scenario where they have to make a series of decisions about properly using a table saw. Provide me with a short RPG guide that I can use to explore a real-world setting and introduce students to potential hazards surrounding this topic.”

This prompt sets a clear objective, ensuring the AI focuses on safety and the specific skills students need to develop. Keep in mind that this prompt may need to be followed up on to meet your and your students’ needs and to train the AI. Keep working with the AI to get the best product for you.

Guiding the Scenario

As the creation of the scenario unfolds, use follow-up prompts to help build your guide to walk the students through the scenario. For a more robust scenario, make adjustments based on some of their potential decisions.

al-life situations? Feel free to add other topic points based on the situations we created.”

This prompt helps the AI determine what you would like the students to internalize based on the safety lessons. It also highlights what you are looking for, providing a foundation for your review. You can also ask it to provide examples or real-world tie-ins, but double-check that what you are receiving is accurate and appropriate.

Now What?

AI is already a valuable asset in teaching safety in agricultural mechanics. From creating custom safety simulations to offering immediate, personalized feedback, these tools have the potential to transform our classrooms and better prepare our students for real-world challenges.

While AI won't and shouldn't ever replace the fundamentals of good teaching, it is the latest in a long line of tools that can provide us with ways to engage students and integrate safety into their learning. At some point before any of us were teachers, film strips and videos were thought to be the “wave of the future” and were seen as a threat to take good teachers out of the equation, but we were quick to see they are just tools to help keep us doing what we are best at: helping people learn. Just as these tools took time to perfect, AI is still developing, but the tools available now are more than enough to start making a difference.

Whether building a safety scenario, creating more interactive content, or using AI to offer more detailed feedback, experimenting

with these tools could reveal what works best for your students. The goal is to ensure they leave our classrooms with practical safety skills to carry confidently into their careers. Try asking a generative AI tool a couple of simple tasks you need help with and give it a chance. If it messes up, tell it what it did wrong and try again. It's not perfect, it has potential. So, take a chance and explore the possibilities of how AI can enhance your teaching.



Garrett T. Hancock is an Assistant Professor in Agricultural Engineering Technology at Stephen F. Austin State University.



Jason McKibben is an Assistant Professor in Agricultural Education at Auburn University.



OP McCubbins is an Associate Professor in Agricultural Education, Leadership and Communications at Mississippi State University.

Rural Roots, Digital Future: Artificial Intelligence in Real-Time Agricultural Education

by Dr. Jaehyun Ahn, Dr. Edwin C. Price, & Dr. Brian E. Myers

The late Norman Borlaug, famously known as the father of the Green Revolution who saved a billion lives, reminded every agricultural educator of the significance of food security: “The first essential component of social justice is adequate food for all mankind. Food is the moral right of all who are born into this world” (Norman Borlaug Nobel Lecture, 1970).

Although food security is an important topic for agricultural education, it can often be challenging for educators to discuss with students. Despite this, we must work to understand the issue if we are ever going to work to address it.

Globally, four in ten people (3.1/7.9 billion) in 2021 could not reach the four food security standards (i.e., access, availability, stability, and utilization). Access is the ability to acquire food from income, production, government, or other means. Availability and stability indicate that every individual has access to proper nutrition without obstacles of conflict, distance, or extreme weather throughout one’s lifetime. Utilization implies

These two separate word clouds, created using Bjorn’s Word Clouds (with a subscription), highlight the unique importance of predictors of Ghanaian farming households (on the left) or Liberian and Senegalese communities (on the right) to mitigate food insecurity.

clean water and adequate sanitation for healthy diets (FAO, n.d.; World Bank Group, n.d.).

Food security has rural roots. Globally, family farms produce over 80% of the world’s food. However, most smallholding households are victims of persistent food insecurity (Ritchie, 2021). We should not consider food security as another country’s problem. Last year in the U.S., one out of every eight households could not meet food security standards (Feed the Children, n.d.). Recent extreme weather events, inflated food prices, and limited market access raise concerns for a stable food supply.

When considering all these issues, it may seem insurmount-

able to use technology to address food insecurity concerns. However, a project in West Africa provides a real-life example of how artificial intelligence (AI) helps address global issues in food security. As teachers strive to inform their students about agriculture’s impact around the globe, U.S. school-based agricultural educators can use this example to discuss AI applications and global food insecurity with students.

Bridging AI and Food Security

In 2012-2013, the Howard G. Buffett Foundation supported a groundbreaking Food Security and Production Assessment for Ghana, Liberia, and Senegal (three countries). The challenge

Globally, family farms produce over 80% of the world’s food.



was understanding better how families with different amounts of farm assets (land, tools, equipment, buildings, and finances) meet their food needs. We collected extensive data from 1,477 diverse farming households in 12 rural areas across the three countries (Ahn et al., 2022). The survey was thorough; the households answered 150 questions in the questionnaire. There were significant variations in gender, agroclimatic conditions, farming techniques, labor use, and income levels on top of social and political conflicts (Ahn et al., 2022).

We set out to classify households' food security and identify critical factors, considering any response variations. Our on-the-ground experiences and observations supported this effort, but we also sought impartial validation. It has led us to utilize machine learning, a subset of AI.

What did we learn from this AI application? Our word clouds display the size and color of each word to identify factors related to

household food security. In the illustration of Ghana (on the left side), crop income, fertilizer, and insecticide are darker and more prominent, indicating their importance. Other important terms such as additional spending on food items, off-farm income, and farming constraints are represented by lighter-colored words. Less frequent words such as including technology and districts are smaller font sizes.

The word cloud on the right side of the Figure represents Liberia and Senegal together. The most prominent term is community, suggesting that collective efforts play a significant role in addressing food security. Support, labor, and natural land conversion for higher crop yield complement the role of communities. Credit and off-farm activities are less frequently observed and practiced among participants but are essential for farming entrepreneurship and improving food security.

Digital Future: Real-Time Agricultural Education

Our example informs strategic interventions to address various food security challenges. We see the potential of AI applications in food security because these tools can provide up-to-date and specific information about communities. We seek to address global food insecurity and establish a more equitable food security platform for the world. As we reflect on the past, we should make efforts today to build a dashboard we can all use to help support food security efforts in the future.

Bringing It All Together for the Future

In the next 30 years, our world will be different. The population will exceed 9.6 billion, 1.5 billion more than now. There are more challenges to come. Our natural resources are becoming scarcer. Our climate is changing, and we will likely reshuffle food, fiber, feed, biofuel, medicinal, and other crops between the warmer and drier south and the cooler and wetter north ("Climate change will force farmers," 2022).

Food security is a complex and constantly changing issue in the agricultural landscape. As agricultural educators, we aim to ensure that every student is well-informed about this issue so we can work toward addressing it.

We are committed to providing the most accurate, comprehensive, and current food security information using AI. We hope that students, as the next generation of leaders in agriculture and other fields, will remain



Building a universal dashboard is real-time and community-specific so everyone in the world stays up to date.

Note: This image was created using DALL-E 3 image from ChatGPT-4 prompts after training our sample display.

attentive to the world and the various causes and consequences of this issue, raise their voices, and act for a better, more secure world tomorrow.

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Jaehyun Ahn is an Assistant Professor of Artificial Intelligence Extension in the Department of Agricultural Education and Communication at the University of Florida.



Edwin C. Price is a Professor and Howard G. Buffett Foundation Endowed Chair on Conflict and Development in the Department of Agricultural Economics at Texas A&M University.



Brian E. Myers is a Professor of Agricultural Education and Chair of the Department of Agricultural Education and Communication at the University of Florida.

Empowering Educators: Elevating FFA Contest Training with Gen AI

by Jessica Benson, Dr. Casandra Cox, Dr. K. Jill Rucker, & Cora Andrews

For those in agriculture, hearing the term AI means working with livestock to reproduce desirable traits to create a prize-winning herd. However, a new form of AI is making headlines. Generative artificial intelligence (Gen AI) allows us to augment, automate or reinvent the way we tackle day-to-day functions (Wilson & Daughety, 2024). In the world of education, Gen AI can “enable educators to customize learning experiences for their students” (Green, 2023, p. 2). Common Gen AI systems available to educators include ChatGPT or Microsoft Copilot. Both systems use large language models (LLM), which allow you to have conversations to generate code, answer complex questions, create presentations, and summarize content. Let’s discuss how agricultural educators can put Gen AI to work focusing on preparing student teams for contests like Career and Leadership Development Events (CDEs/LDEs).

Tell Me What I Need to Know—Creating Prompts that Yield Results

Success in using Gen AI revolves around the ability to create effective inputs or “prompts.” The user must learn to think with Gen AI by giving specific instructions to produce desired outcomes and measurements (Wilson & Daughety, 2024). This will assist Gen AI in learning to think with you, learning the context of your program, and producing results tailored to the task you have provided.

Successful prompts are broken down into steps. As you work with Gen AI, think in stages to

Tell the system what you are thinking. Be creative. Help the system learn with you.

generate better outcomes. Work with the system as you would work with your students. Break tasks into bite size pieces and offer suggestions for improvement as you continue through the process. Be specific in your requests. Consider defining aspects including context, the audience (grade level), and the tone. If you want something tweaked, ask the system to tweak a specific area. Not happy with your original results? Ask the system to try again and change your prompts with more specific information of what you need in the output. Tell the system what you are thinking. Be creative. Help the system learn with you.

Using AI to Prepare CDE and LDE Teams

Incorporating Gen AI into FFA CDE and LDE training can transform how teams prepare for competitions. With Gen AI, you can easily create customized training schedules, develop detailed curriculum guides, summarize complex handbooks and rules, generate ideal examples based on contest rubrics, and create mock documents. Gen AI can even be used as a brainstorming tool during preparation to spark innovative ideas, creative solutions, or develop non-traditional approaches. These Gen AI-driven tools streamline the process, making

it more efficient and tailored to each contest, giving students a competitive edge in events.

To illustrate how you can integrate Gen AI tools into your training, consider these detailed prompt examples:

Creating Training Schedules

Prompt: “Attached is the handbook on the livestock evaluation CDE. Analyze the handbook and create a step-by-step training guide for my livestock evaluation team. Break the training into 1-hour sessions, conducted twice a week over a 6-week period.”

Gen AI Output: Provided a structured 6-week training plan, detailing session topics like evaluation criteria, assessment techniques, and feedback review.

Developing Curriculum Guides

Prompt: “Generate a curriculum guide for a parliamentary procedure LDE that integrates state educational standards. Include how I can use this guide to align training with classroom curriculum and match standards and subjects taught in class.”

Gen AI Output: Delivered a curriculum guide that aligns with state standards and integrates training into classroom subjects, supporting both contest preparation and educational goals.

Summarizing Handbooks and Rules

Prompt: “Attached is the handbook for the Employment Skills LDE. Summarize the key components of the handbook, including essential elements such as cover letter and resume submissions, application and telephone interviews, preliminary face-to-face interviews, networking activities, and job offer negotiations. Provide a simplified checklist of needs and a key information breakdown for each component.”

Gen AI Output: Summarized the handbook, highlighting key

activities and skills, and provided a simplified checklist and key information breakdown for each component.

Gen AI removes LDE and CDE contest barriers including time spent preparing training materials and providing feedback. ChatGPT can be tailored to assist with critical thinking, creative, and evaluation-oriented contest tasks. Outputs should always be reviewed for accuracy and to ensure materials fit the current contest rules. We suggest starting with a prompt to describe the contest followed by prompts with specific activity descriptions from the contest handbook.

Creating Practice Activities

Prompt: “Based on the overview of the Conduct of Chapter Meeting contest, create a 100-question bank for the written exam. Include multiple-choice questions with answer options and identify the correct answer. The questions should cover basic officer duties from the FFA Manual and parliamentary procedure, including permissible motions and order of business as per Roberts Rules of Order Newly Revised.”


Gen AI Output: Delivered a comprehensive 100-question multiple-choice bank for the written exam, addressing key topics such as officer roles and parliamentary procedure, complete with answer options and the correct answers indicated.

Prompt: “The contest includes a keep and cull activity. Description from the handbook is: Keep/cull classes: There will be three keep/cull classes, each made up of eight breeding animals, which will be beef heifers, gilts, and ewes. Participants must select the best animals from the eight using visual appraisal and performance data. Performance data will be provided. Production/performance data (including EPDs) may be used in the keep/cull classes of beef, swine, and sheep. Performance criteria, when used, shall be based on current industry standards. Can you create a scenario for selection plus a data set for each scenario for beef heifers, gilts, and ewes?”

The AI-Powered Success: Pro Tips for Elevating Your National FFA Contest Training infographic serves as a comprehensive and quick reference to enhance your CDE and LDE training using Gen AI.

AI-Powered Success:

Pro Tips for National FFA Contest Training



A.I. is **TRANSFORMING** the way way FFA teams approach CDE/LDE preparation.

Whether it's generating **CREATIVE** ideas or **REFINING** evaluation strategies, A.I. can provide the edge you need to **EXCEL**.

Discover how A.I. can be your team's **SPECIAL ASSET** in the journey to CDE/LDE **SUCCESS**.

3

PRO TIPS FOR PROMPT GENERATION

HUMANIZE THE PROMPT #1

Approach A.I. like a TEAM MEMBER:

- * Start with prompts that encourage the A.I. to ask clarifying questions, such as "Ask me 5 questions that will help you complete the task."
- * This ensures the A.I. understands your needs and tailors its responses, creating more *relevant* and *effective* outputs.

START WITH LOTS OF DETAIL #2

Provide the A.I. with as much information as possible.

- * A detailed prompt can include contest guidelines, expected outcomes, or subject matter.
- * The more context you give, the better the A.I. can tailor content like practice questions or scenarios that align with your CDE/LDE team.

START BASIC AND EDIT #3

Start with a simple, straightforward prompt and refine it as you go.

- * As the A.I. provides results, you can tweak and adjust the prompt by adding more context.
- * This will improve accuracy and relevance, ensuring it meets your team's needs.

WONDERING HOW YOU CAN USE THIS FOR YOUR TEAM ?

FOR ALL CDE/LDE TEAMS:

CREATE TRAINING SCHEDULES
* Provide the CDE/LDE handbook and ask A.I. to provide a step-by-step training guide.

SUMMARIZING HANDBOOKS & RULES
* Ask A.I. to summarize the key components of the handbook and provide a simplified checklist of needs and a key information breakdown for each component.

FOR "EVALUATION" TEAMS: SIMULATED SCENARIOS

- * Ask A.I. to create simulated evaluation scenarios for your team with detailed descriptions.

GENERATING TRAINING MATERIALS

- * Develop visual aids and reference materials for your CDE/LDE including images, comparison guides, & text to help your team understand what constitutes high-quality in your subject and common issues to avoid.

FOR "CREATIVE" TEAMS: MOCK CONTEST DOCUMENTS

- * After attaching the contest handbook or other relevant documents, ask A.I. to develop outlines, templates, practice tests, and much more.

BRAINSTORMING TOOL

- * Generate ideas for topic areas by narrowing a topic down or finding an option with limited resources.

Gen AI Output: Generated a keep/cull scenario for each species for eight animals with performance data and EPDs. The scenarios challenge participants to make informed decisions using visual appraisal and performance metrics. The generated results were comparable to past National FFA scenario descriptions and data sets.

Gen AI can be used for creative contests during the preparation process. Prompts can yield outlines for story structure, appropriate interview questions, scriptwriting templates, visual aid incorporation, design principles, and software use tips. Here is a sample prompt to get your team thinking about use and planning their strategy.

Creating Examples Using Rubrics

Prompt: “I am creating a 60-90 second broadcast on the New Horizons website. The options are television story, online video, radio story, podcast, or slideshow. What topics are best for each broadcast type? The goal is to promote readership of a feature story. Also, which of the following software

is best for the broadcast type? My options are Spotify for Podcasters, Adobe Premiere, Adobe Express, Ruch, Audition, Canva Video, iMovie, Movie Maker, Anchor, BounceCast or PodCastle.”

Gen AI Output: The results were a list organized by media type with topic ideas including the type of content (audio, visual, interviews, expert opinions, etc.) and the best software for the intended outcome.

Prompt: “Analyze the contest rules, event materials, and scoring rubric for the Extemporaneous Public Speaking LDE. Based on this analysis, create a speech template and outline that optimizes scoring. Provide tips for presenting the speech effectively according to the rubric criteria, including how to handle the Q&A segment.”

Gen AI Output: Generated a speech template and outline based on the rubric, with tips for effective presentation and handling the Q&A session.

Beyond the creation of practice materials, Gen AI can assist in brainstorming and feedback

processes. Using prompts, you can generate ideas for topic areas. This may be narrowing a topic down or finding an option with limited resources.

Brainstorming

Prompt: “I need a low budget, high impact Agriscience Fair research project in animal agriculture that does not require animals and can be managed during the school day.”

Gen AI Output: Generated seven options with a summary of the objective, data collection, and impact. The topics included feed, soil health, consumer preferences, economics, packaging, and policies.

Evaluation and Feedback

A simple form of feedback can be achieved by inputting the evaluation criteria and the student’s work and then a request to evaluate the work using the criteria. A more comprehensive feedback method is to seek areas of improvement by including the evaluation criteria and asking for areas of improvement or suggested changes. You can use the suggestions to coach your member or team. One additional feedback strategy is to provide a quality work sample and prompt an analysis of the work and identify successful key components or strategies others should integrate.

Prompt: “Using the National FFA Prepared Public Speaking contest handbook, can you evaluate the written speech and suggest specific areas for improvement?”

Gen AI Output: Provided a list of strengths and areas for improvement based on the criteria and provided written speech.

I am training a conduct of chapter meetings team for the 2024 FFA contest. Can you summarize the structure and rules of the contest based on the National FFA website?



The Conduct of Chapter Meetings Leadership Development Event (LDE) is designed to evaluate FFA members’ ability to effectively participate in a chapter meeting using parliamentary procedure. This event helps students develop leadership skills, critical thinking, and a thorough understanding of parliamentary law. Below is a summary of the structure and rules of the contest based on information typically provided by the National FFA Organization.

Purpose and Objectives

- Leadership Development: Enhance students’ leadership abilities and confidence in conducting organized meetings.
- Parliamentary Proficiency: Promote understanding and application of parliamentary procedure according to Robert’s Rules of Order Newly Revised.
- Effective Communication: Develop skills in clear and effective communication during formal meetings.
- Critical Thinking: Encourage quick thinking and problem-solving during meeting scenarios.

This is an example ChatGPT prompt and output for training of Conduct of Chapter Meetings team.

Prompt: “Using the poultry science evaluation criteria for written factors, what strategies can I use to better prepare my students to identify shell soundness?”

Gen AI Output: Suggested six strategies for learning including hands-on practice, sensory training, technology use, peer learning, visual aids and diagrams, and simulations.

Learn to Work Smarter with Gen AI

Gen AI can be an efficient and effective CDE and LDE preparation tool. Using quality prompts and including specific learning outcomes, tone, grade levels, and other criteria will generate stronger results. We encourage educators to test the techniques presented in this article to determine if Gen AI is right for them. Adjust the strategies to fit your students, available resources, and teaching style. Have your students engage

in this process to self-check their work and develop valuable workplace skills. Set the example by using Gen AI responsibly, checking the accuracy of your outputs, recognizing the limitations of Gen AI, and teaching your students ethical AI usage practices. Parting advice—consider which tools support career preparation among your students and bring cases for this to the table when rule revisions are being discussed and made.



Jessica Benson is an Assistant Professor of Agricultural Leadership at Mississippi State University. Email: jbenson@humansci.msstate.edu



Casandra Cox is an Assistant Professor of Agricultural Communications and Leadership at the University of Arkansas in Fayetteville. Email: ccrumle@uark.edu



K. Jill Rucker is an Associate Professor and Graduate Coordinator in the Department of Agricultural Education, Communications and Technology at the University of Arkansas in Fayetteville. Email: kjrucker@uark.edu



Cora Andrews is a master's student in Agriculture and Extension Education at Mississippi State University.

Agricultural Innovations CDE: Preparing Students for Agriculture 4.0

by Lily Oliphant

Within the next 25 years, the AgTech industry is expected to grow considerably worldwide due to the rising demand for food, the need to address climate change, and the adoption of cutting-edge technologies. This movement, known as “Agriculture 4.0,” focuses on the emerging trends in the agricultural sector that will address future industry challenges, such as feeding a projected global population of 10 billion by 2050. To overcome these challenges, global food production will need to increase by at least 80%, with around 70% of that growth being directly linked to technological innovations that increase efficiency and sustainability in agriculture (FAO, 2009).

To meet these demands, educational institutions and agricultural organizations need to equip the next generation of farmers

and agricultural professionals with the tools and knowledge to succeed. The Washington State University-led AgAID Institute, in collaboration with Washington State’s FFA Organization (with over 14,000 students), is introducing a new Career Development Event (CDE) called Agricultural Innovations in fall 2024. The CDE will focus on four areas: data analysis, drones, computer technology, and robotics. It will expose students to skills needed in Ag 4.0 and encourage them to pursue career paths that will integrate advanced technology and AI into agriculture.

AgAID Institute and Its Role in AgTech Education:

The [AgAID Institute](#) is one of five “AI for Agriculture” Institutes in the United States funded through the USDA-NIFA. Its mission goes beyond simply integrating artificial intelligence into agriculture; the Institute aims

to create a long-term symbiotic partnership where AI, agricultural science, and human systems work together to address some of the most complex societal challenges. The integration of AI into agriculture is not just about automation or efficiency, but about utilizing technology to address issues such as climate change, resource scarcity, and the growing demand for food.

The AgAID Institute envisions a future where AI plays a pivotal role in optimizing agricultural productivity in ways that are sustainable and scalable. For example, AI can be used to develop predictive models that help farmers make better decisions regarding planting times, irrigation needs, and pest control. Machine learning algorithms can analyze vast amounts of data to identify patterns that would be impossible for humans to detect, leading to more efficient use of resources such as water and fertilizer.

(LEFT) Students at the FFA state convention in Pullman, Washington, listening to AgAID representatives present about AI in Agriculture.

(RIGHT) FFA Students learning about the use of drones in farming and how AgAID uses AI to assist local farms.



By partnering with Washington FFA, the AgAID Institute is laying the groundwork for this future by educating the next generation of agricultural professionals – high school students. The new AI-focused curriculum developed for FFA members will provide students with hands-on experience in using AI and other advanced technologies to solve real-world agricultural problems. This collaboration will also help students understand the broader implications of their work, such as how their innovations can contribute to global food security and environmental sustainability.

Ag Innovations Career Development Event (CDE):

The Agriculture Innovations CDE is designed to bridge the gap between traditional agricultural education and the rapidly evolving technological landscape of modern farming. By participating in this event, students will be exposed to various aspects of agricultural technology, from precision farming techniques to the use of drones for monitoring crops and livestock. There are six components to this CDE: an individual written exam for each student, three practicum areas (robotics, data analysis, and computer technology), a team-based drone competition, and a team presentation. The CDE emphasizes the importance of teamwork and collaboration. The team presentation component of the event challenges students to work together to develop innovative solutions to real-world agricultural problems. This interdisciplinary approach encourages students to think critically and creatively, drawing on their knowledge of technology, data science, and agriculture to address pressing challenges facing the agriculture industry.

One of the key components of the practicum within the Ag Innovations CDE is data analysis. In today's agricultural industry, data are a valuable resource that can be used to optimize everything from planting schedules to resource allocation. Students participating in the CDE will learn how to collect, analyze, and interpret agricultural data to make informed decisions that enhance productivity and sustainability. Utilizing Microsoft's Farm Beats technology, students will be given an example of data collected from a specific area within Washington and have to analyze and make decisions based on the data sets. Additionally, they will be tasked to collect their own data using the sensors. The students will be given a problem to analyze such as: "Sun Valley Seed

“The Agriculture Innovations CDE is designed to bridge the gap between traditional agricultural education and the rapidly evolving technological landscape of modern farming.”

is looking to expand into Washington with a hybrid of corn that has been tested in various plots throughout the Midwest. Using the data sets from the test plots, provide analyses and recommendations based on the growing environment within the Columbia Basin of Washington State.” This is one of many examples Washington FFA could use for this section of the CDE.

Another important aspect of the CDE is the integration of drone technology into agriculture. Drones have become an invaluable tool for farmers, providing a bird's-eye view of their fields and enabling them to monitor crop conditions more efficiently. Students in the CDE will learn how to program and operate drones and run test flight patterns. This

hands-on experience will give them a deeper understanding of how drones can be used to improve farm management while reducing labor costs and environmental impact.

The robotics portion of the CDE focuses on the use of automation to enhance productivity and efficiency in agriculture. Robotics can be used for a variety of tasks, from planting and harvesting crops to sorting and packaging produce. By learning how to design, program, and operate agricultural robots, students will gain valuable skills that are in high demand in the modern agricultural workforce. Students will be given a VEX IQ robot and learn to design and build their robot how they see best for the competition. Each

year those students participating in the robotics section will have to build a robot with the same materials but different mechanisms for the task. For example, in the first year, students will design a robot (in minia-

ture) that can move bins around an apple orchard, and in subsequent years they could design a robot that can apply fertilizer.

During the spring and summer of 2024, a team of three people created the entire Agriculture Innovations CDE. Team members were Lily Oliphant, an undergraduate at Oregon State University studying robotics; Jordan Jobe, manager of the AgAID Institute; and John Grubbs, head agricultural science teacher running the project. The three consulted with other FFA advisors in Washington to gather information and input from those interested in the project. This project will run its pilot CDE in spring 2025 and we are excited to see how students engage with the program.

By participating in the Agriculture Innovations CDE, students are not only gaining practical skills, but also contributing to the advancement of the agricultural industry as a whole. As the demand for food continues to rise and the challenges facing agriculture become more complex, the need for innovative solutions has never been greater. The skills and knowledge gained through this program will prepare students to lead the way in developing these solutions, ensuring that agriculture remains a viable and sustainable industry for generations to come.

The Future of AgTech and Education:

As we look to the future, it is clear the intersection of agriculture and technology will play a crucial role in addressing some of the most pressing challenges facing our world. The collaboration between Washington State University's AgAID Institute and Washington FFA is a testament to the importance of education in shaping the future of agriculture. By equipping students with the skills and knowledge they need to succeed in the rapidly evolving field of AgTech, this partnership is helping to ensure that the next generation of agricultural professionals is prepared to meet the demands of a growing global population.

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Lily Oliphant is a third-year honors mechanical engineering student studying robotics at Oregon State

A New Age of Agricultural Education: The Emergence of Artificial Intelligence in the Classroom

by Cheyenne Bastian-Brown

As we move through the 21st Century, there are many emerging concepts and skills educators are focusing on to ensure student success. Some of these skills include communication, problem-solving, global awareness, technology skills, and digital literacy (Hummel & Hummel, 2024). One portion of technology skills and digital literacy is using powerful and emerging technologies such as artificial intelligence to revolutionize the classroom and agricultural landscape. Artificial intelligence offers opportunities to enhance both classroom learning and practical experiences for student understanding and cognitive connection. Along with great possibilities also come great concerns, and there are some ethical challenges that must be addressed to ensure responsible use by students. This essay explores the applications of artificial intelligence in agricultural education, the ethical implications of its adoption, and the best practices for integrating artificial intelligence into classrooms and student organizations.

One of the most significant contributions of artificial intelligence to agricultural education is its ability to offer personalized learning. In agricultural education, the composition of a classroom can vary greatly based on the student population. Some students in the classroom may have agricultural experience, while others may have no prior knowledge of agricultural application. Artificial intelligence-driven platforms adapt to the indi-

vidual students' learning styles and paces, providing customized experiences and learning that can help each student strive at their own pace (Walden University, 2024). Additionally, this realm of learning can pull from multiple sources to provide both theoretical knowledge and hands-on-skills for difficult concepts such as crop sciences, animal husbandry, and soil management. In addition, artificial intelligence can be used to power virtual simulations and gamified learning experiences to gain student interest. Virtual farming simulations allow students to experiment with different farming techniques or management strategies without needing physical resources. This allows each student to learn in a new way, while also allowing for trial by error in a safe environment (Dai & Ke, 2022). Lastly, educators can devote more time to student achievement and lesson preparation with artificial intelligence as it can direct administrative tasks such as grading and attendance (Silvestrone, 2024). Therefore, there are benefits to both the students and the educator in the long run.

Despite the advantages to integrating artificial intelligence into the classroom there are some ethical implications when looking at bias, data privacy, and student integrity. A key issue when looking at artificial intelligence is that many of the programs have an internal bias integrated into the algorithm. These systems are only as good as the information they are trained on, and if the data integrated contains bias,

this could result in unequal opportunities for students based on factors such as socioeconomic background or access to technology (Walden University, 2024). Another concern that arises ethically is data privacy. Current artificial intelligence applications require vast amounts of personal data to function, which, in turn, can include data on student's learning behaviors and academic performance, which is protected under the Family Educational Rights and Privacy Act (*What Is FERPA? | Protecting Student Privacy*, 2024) Lastly, there is a risk with student integrity that comes about when integrating artificial intelligence into the classroom. Overreliance on artificial intelligence and a lack of academic performance in all areas of education can lead to lower reading levels, comprehension, and the loss of soft skills needed for future employment (Miller, 2023). Even with the ethical implications of artificial intelligence, this is an integral tool to implement in the classroom across any discipline. A best practice that can be used for application in any classroom is teacher training and professional development. Students are best acquainted with new tools when educators are well-versed in the tools themselves. In using professional development programs to equip teachers with skills to integrate artificial intelligence into their teaching, students still gain the human element of education as well.

In conclusion, artificial intelligence holds promise for future use in agricultural education with

personalized learning, expanded knowledge, and innovative teaching. Although there are some ethical implications, such as bias, privacy, and student integrity, the benefits outweigh the negatives with proper use. By adopting best practices like teacher training, agricultural educators can harness the power of artificial intelligence while preparing students for a future in the ever-evolving agricultural industry.

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Cheyenne Bastian-Brown is a senior agricultural and extension education student at Penn State University.

Cheyenne is the winner of the 2024 Alpha Tau Alpha Essay Contest in the Individual Author Division.

Cultivating the Future: Artificial Intelligence in Agricultural Education

by Jessica Carlson & Kadie Pierson

The agricultural sector increasingly embraces data-driven and technology-centered approaches, with precision agriculture, drone technology, and farming automation leading the way. As a result of these advancements, agricultural education instructors have had to adapt to prepare students for these new technologies. Recently, the inclusion of Artificial Intelligence (AI) has represented a new transformative force that presents opportunities for those in agricultural education. AI has the potential to enhance teaching tools and facilitate personalized learning experiences, but it also introduces significant risks. This article will explore both the potential benefits of integrating AI in the classroom and the challenges and implications it poses for those in school-based agricultural education.

Artificial intelligence (AI) offers benefits to both students and teachers in the classroom. One of its key advantages lies in its capacity to analyze extensive datasets, enabling the provision of personalized recommendations. This personalized approach allows students to tailor their learning experiences based on their individual needs, learning styles, interests, and preferences. AI technologies, such as ChatGPT, can act as a support function to the person-driven education system (Ali et al., 2024). Educators can use ChatGPT with conventional teaching approaches such as in-person lectures, group discussions, and collaborative learning activities to ensure that students engage socially and interact with their peers and

instructors in a dynamic learning environment. Additionally, virtual simulations represent another application of AI that can be integrated into the classrooms to facilitate interactive experiences. This not only enhances a student's comprehension of a topic, but also develops their critical thinking and problem-solving skills (Teachflow, 2024). Further, leveraging AI as a resource for virtual simulations enables students to better understand complex agricultural concepts taught in their classrooms.

Artificial intelligence presents numerous opportunities, yet it also poses significant challenges. One of the hurdles lies in adequately equipping educators to effectively use AI, while both new and experienced teachers may struggle to grasp the complexities. This places demands on teachers' time as they familiarize themselves with this technology and incorporate it into their teaching practices. While AI can undoubtedly aid educators in predicting student behaviors and providing feedback, there are issues, such as generating inaccurate results. The history of innovations in education is full of lost promises that fail to understand how teachers work and the culture of schools (Pedro et al., 2019). While AI has the potential to address countless challenges faced by educators, it's currently unreliable, especially in the realm of agricultural education. The second challenge associated with AI pertains to ensuring inclusivity and equity. Although AI can open new possibilities, it can also be a disruptive technology. It may deepen the existing inequalities

and divides as the marginalized and disadvantaged populations are more likely to be excluded from an AI-powered education (Pedro et al., 2019). It is imperative that educators and technology developers work together to establish a framework that emphasizes accessible and valuable training. This collaboration should foster an environment that promotes ongoing learning and adaptation, aiming for AI to serve as a tool rather than an obstacle.

When examining artificial intelligence, it is crucial to consider its implementations. One notable implication is personalized learning, which allows students to adapt learning materials to their specific needs and learning styles. Through the utilization of AI, customized learning materials and adaptive learning pathways can be developed. AI tools can be used to dynamically adjust the complexity and type of learning materials based on student interactions and performance, creating a personalized learning experience that can accelerate mastery of topics (University of Illinois, 2024). Furthermore, AI can be leveraged to create virtual simulations that aid students in comprehending concepts. This has the potential to significantly enhance the classroom learning experience by providing students with assistance in understanding the various intricate topics covered in agriculture education. You can leverage AI to include a wide range of perspectives and examples in learning materials, promoting inclusivity and broadening students' understanding of complex subjects (University of Illinois, 2024).

Our research thoroughly explored the potential benefits of integrating AI into the classroom and its implications for agricultural education. AI has the capability to offer personalized learning experiences and enable virtual simulations, thus greatly improving the overall educational journey for students. However, the successful integration of AI requires careful consideration of its limitations to ensure fair access for all. It is crucial for educators to receive proper training to ensure that AI tools are used as a complement rather than a substitute. Through collaborative efforts, AI can empower both students and educators, ultimately leading to a more innovative, inclusive, and effective agricultural education.

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Jessica Carlson is a senior agricultural education student at Illinois State University.



Kadie Pierson is a senior agricultural education student at Illinois State University.

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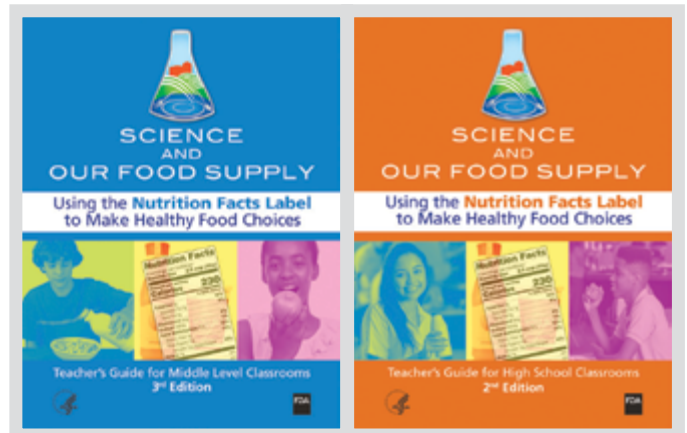
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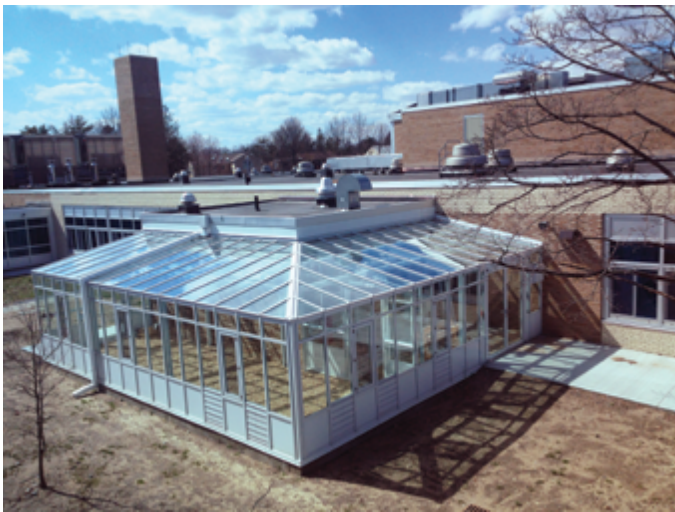
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