Imagine That: Exploring AI Imagery in Relation to Mental Schemas

Channing Pieniazek
Graduate Student
Department of Agricultural Education and Communications
Texas Tech University
channing.pieniazek@ttu.edu

Hannah Gustin
Graduate Student
Department of Agricultural Education and Communications
Texas Tech University
hgustin@ttu.edu

Laura Fischer, PhD.
Associate Professor
Department of Agricultural Education and Communications
Texas Tech University
laura.fischer@ttu.edu

Imagine That: Exploring AI Imagery in Relation to Mental Schemas

Introduction & Need for Innovation

Generative artificial intelligence (AI) dates back to 2014; however, it has recently increased in popularity, with an estimated 34 million AI-generated images developed each day (Knight, 2023; McConnell, 2024). This technology produces an image based on user-developed text prompts, giving a visual representation of the requested concept. While highly innovative, generative AI results are limited to previously published works, creating the possibility for bias. The presence of this bias is supported by research (Gorska et al., 2023) finding when AI programs were asked to develop images of persons in a variety of professions, 91% of the subjects were male, suggesting gender bias in the workforce.

Knowing this technology is predisposed to bias, it is important for agricultural communicators to understand current public perspectives and how they are shaped by AI to ensure individuals are receiving an accurate portrayal of agriculture. Agricultural literacy is a widely discussed topic in research, and with many consumers lacking personal experience in agriculture, there is a risk for misconceptions to become their understanding. Rumble (2014) found words surrounding agriculture can be framed with little context, suggesting the accuracy of the limited context available is critical. With the uprising of AI, AI literacy becomes increasingly important. AI literacy is defined by Tzirides et al. (2024) as "an understanding of AI technology, responsible and effective use, and application of critical thinking to their design and implementation" (pp. 1-2). The topic of AI literacy is vital to this conversation because understanding what images are being generated by AI will help us understand how AI is sharing perspectives about agriculture with its users.

How it Works

Students in a graduate-level agricultural communications course have been exposed to a variety of theoretical frameworks and how these principles explain how opinions and attitudes are shaped. With the recent rise in popularity of AI images, students were asked to examine and discuss how AI images were created and how they shaped perceptions of agriculture and natural resources topics. To complete this discussion, students chose a controversial, hot topic in agriculture. Next, they were given a worksheet, created a Generative AI image, and answered a series of questions to guide the discussion: 1) *before prompting AI, how do you expect AI to visualize your topic, 2) What platform, keywords, and/or description did you use?, 3) Did the AI image align with your expectations or did it surprise you?, and 4) How do AI image generation tools reflect or challenge societal schemas?* After completing the worksheet, the students participated in an engaged discussion about the implications of AI on perceptions of agriculture and natural resources. The results in the section below summarize the thematic analysis from the students' worksheets (Erlandson et al., 1993).

Results to Date

Students utilized a variety of AI tools to generate images of their selected topics. The most used tool was ChatGPT (6 of the 11 students), followed by Adobe Firefly (3 students) and Microsoft Copilot (2 students). A recurring theme among student reflections was the expectation that *AI would struggle to produce accurate images*, particularly for niche agricultural topics. One student noted they "Expect AI to struggle to accurately predict my topic since it is somewhat

niche." Many students anticipated that AI's limited database related to more specialized subjects and would lead to *unrealistic or misleading representations*. For example, "combining army images and meat products" for the topic of "The War on Meat." The students' *expectations were met in cases involving emerging and less public-facing topics*, such as lab-grown meat, where AI generated images clearly lacked detail or contained inaccuracies. However, students noted AI-generated images for more *widely discussed consumer-focused agricultural issues were relatively accurate*, such as GMOs and organic food. One student noted, "It surprised me that it came out somewhat accurate" after generating an image with the prompt "create an image of a consumer buying 'non-GMO' produce."

This activity prompted discussion about how the *volume of available online content influences AI's ability* to generate realistic portrayals. In particular, a student said, "These tools can only work with what they know. Therefore, what people are putting out there about the topic is what the AI will show." Beyond accuracy, some students expressed concern about *AI's tendency to reinforce misconceptions* with misleading visuals. To elucidate "It might inaccurately portray topics of agriculture and natural resources based on common misconceptions or stereotypes, which is a vicious cycle that can only be fixed by changing the misconception." Because AI works with its existing knowledge, many students noted the inaccuracies in images *highlighted common misunderstandings about agriculture* that are already present in media. One student said, "[AI] can give us insight as to what the public may think about the topic and how we should change the framework around the topic."

Future Plans & Advice to Others

As AI continues to shape public perceptions, educators will play a key role in fostering AI literacy among students. Additionally, the rise of generative AI raises the need for AI literacy in agricultural education and communications classrooms to train students to utilize these tools, and to also distinguish between AI-generated and real images. In this specific course, students discussed AI's tendency to reinforce existing stereotypes and misconceptions; thus, it is important for educators to equip students with the skills and knowledge to critically evaluate AI outputs, spot biases, and utilize AI as a tool for informed discussions. Encouraging students to analyze AI's strengths while recognizing its limitations will foster a deeper awareness of how information is shaped and ensure they become more effective agricultural communicators. By integrating AI discussions into curriculums and trainings, educators can help students navigate the constantly changing media landscape while promoting accurate and responsible representations of agriculture. Future plans for this idea include expanding this in-class activity to a research study. Researchers could examine a range of agricultural topics and compare the AI-generated images with real world visuals to better understand how reflective AI's portrayal is of agricultural realities.

Costs and Resources Needed

To conduct this activity, students will need access to AI image generation tools. Tools used in our activity were ChatGPT, Adobe Firefly, and Microsoft CoPilot. ChatGPT and Microsoft Co-Pilot are free to use with a user account, whereas Adobe Firefly requires an Adobe subscription. Other generators include Canva, Meta AI, DALL-E 3, and DreamStudio (Lang, 2024). In addition to the platform, students need dedicated time to conduct image searches and reflect on materials. The students in our activity gained participation credit for their discussion in the class.

References

Erlandson, D., Harris, E., Skipper, B. & Allen, S. (1993). Doing naturalistic inquiry: A guide to methods. *Newbury Park, CA: Sage Publications.*

Gorska, A.M., Jemielniak, D. (2023). The invisible women: Uncovering gender bias in AI-generated images of professionals. *Feminist Media Studies,* 23(8), 6. https://doi.org/10.1080/14680777.2023.2263659

Knight, W. (2023, January 12). Where the AI art boom came from-and where it's going. *Wired*. https://www.wired.com/gallery/where-the-ai-art-boom-came-from-and-where-its-going/

Lang, K. (2024, July 3). 7 of the best AI image generators for creators and marketers + example images. *Buffer*. https://buffer.com/resources/ai-image-generator/

McConnell, B. (2024, December 16). 50 AI image statistics and trends for 2025. *Photoroom.* https://www.photoroom.com/blog/ai-image-statistics

Rumble, J.N., Holt, J., Irani, T. (2014). The power of words: Exploring consumers' perceptions of words commonly associated with agriculture. *Journal of Applied Communications,* 98(2), 16. https://doi.org/10.4148/1051-0834.1072

Tzirides, A.O., Zapata, G., Kastania, N.P., Saini, A.K., Castro, V., Ismael, S.A., You, Y., dos Santos, T.A., Searsmith, D., O'Brien, C., Cope, B., Kalantzis, M. (2024). Combining human and artificial intelligence for enhanced AI literacy in higher education. *Computers and Education Open, 6*(100184). https://doi.org/10.1016/j.caeo.2024.100184