



Case Study

Category

Developing AI literacy,
AI image generation

Instructor

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Department

Department of Fiber Science
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College of Human Ecology

Course

FSAD4660: Textiles, Apparel,
and Innovation

Discipline

Fiber Science

Course-level

Senior Undergraduates

Course size

19 students

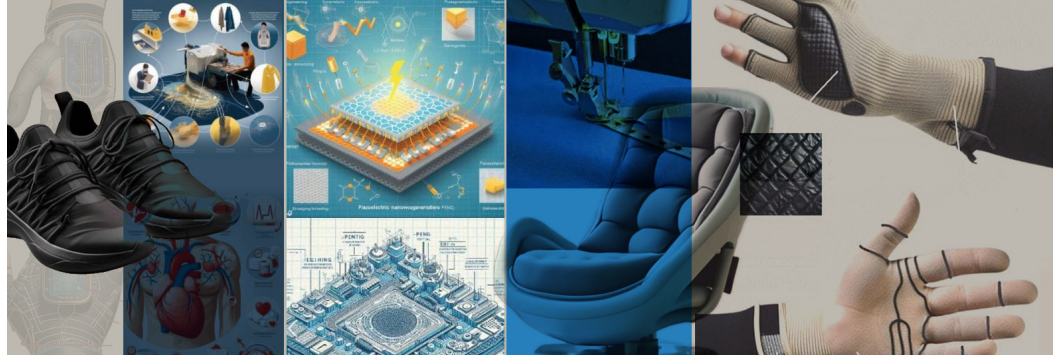
Implemented

Fall 2023

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unabridged version of this
case study



Building AI Literacy through Visualizing Innovative Textile Projects



Students explore the advantages and limitations of AI image generation to visually communicate fiber science projects.

Brief Summary

Students learned how to use generative AI tools to produce high-quality images that illustrate fiber science innovations. Asking students to document their prompts and the resulting images helped them become more skilled at refining the images. A weekly blog, a midterm presentation, and a final poster project guided students in learning the tools and encouraged them to critically reflect on the tools' capabilities as well as ethical considerations.



PillPal "Never forget to take your pills again!"
Christina Simon
Co-authors: Claude ai, Bing Chat, ChatGPT, Midjourney AI
FSAD 4660 Final Project

Problem

- 69% of people are not taking daily medicine
- 29% of people over 65 have dementia
- 39% of people age 50+ struggle with tech

Solution

- Safety**
 - Fingerprint to unlock the pill box
 - Sensors that track removal of pills
 - Option to link it to a pharmacy
- Ease of Use**
 - Large, high contrast displays
 - Voice commands
 - Soft, easy to grasp handles and lid.
- Sustainability**
 - Uses renewable/recyclable materials
 - Rechargeable batteries, solar charging

Category	Material
Textile Casing	Recycled polyester
Screen	Fiber optics, E-ink or electronic paper displays (EPD)
Shell	PLA (polylactic acid) or other bioplastics
Battery	Carbon based batteries

Other possible variations

- Smart pill dispensers: too bulky, no alert function
- Smart pillboxes with connectivity to smartphones: too complicated for elders
- Classic pill dispensers: No alert function
- Pill bottles: Labels are too small, hard to read

A smart pillbox is a valuable tool for individuals, offering timely medication reminders through built-in alarms. This technology minimizes forgetfulness and confusion, promoting greater independence in managing daily health routines. By automating medication adherence, seniors can enjoy a healthier and more autonomous lifestyle.

A poster by Christina Simon, for an assignment

Learning Outcomes



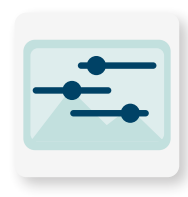
AI Literacy and
Proficiency



Problem-based
Learning



Visual
Communication



Refining
AI-generated
Images

Context

In the field of fiber science, visuals help communicate what an innovative fiber science technology could look like and how it might perform; however, developing high-quality images can be challenging and time-consuming, especially in the context of a class project. For over a decade, students in this course have designed and communicated a fiber science innovative technology in the form of a poster project. In the Fall of 2023, the instructor was interested in exploring with students the potential of using generative AI to develop images for fiber science projects and to identify both the potential and limitations of these technologies.



Hinestroza and student presenting in FSAD466o class

Implementation

Department funding was requested to use the generative AI platform, Midjourney, for all of the students in the course. The instructor and students then started to probe not only this tool but also other available free tools to create unique image scenarios. The students documented their prompting and images by completing a weekly blog set up in their Canvas course. The blog asked students to reflect on how minor changes in prompting caused major changes in the image output of the AI platforms.

For the revised final project, students recreated posters that were designed several years ago for the same course, but this time using generative AI tools. Coupled with the utilization of AI throughout the semester on smaller projects, the final project helped students become familiar with using the tools, while also critically analyzing the challenges.



“I realized that while AI has made remarkable progress, there are still areas where refinement is needed, such as image generation of complex objects like hands, feet, and textual content. Learning to harness the full potential of these tools required experimentation and adaptability, as well as understanding their limitations.”
Ashley Liew, student

Reflection and Future Directions

“The ability to generate high-quality images via generative AI was indeed transformative as it allowed anyone in the group to contribute to the imagery of the poster.” Juan Hinestroza, instructor

High-quality drawing is sometimes a challenge for students in creating posters and group projects but is not a targeted learning outcome for this course. With prompting, these tools remove that challenge and very high-quality images are possible. Also, the images generated served as inspiration for exploring other concepts of their projects.

How to Implement This in Your Class

A good starting point is to identify what students need to visualize and then integrate AI image generation tasks and tool use. You will need to determine which AI image generation tools your students will use and build in time to introduce the tool and ways to prompt image generation. Consider asking students to journal or blog on the challenges and benefits of the AI tool(s). A final step after the assignment is complete could be to ask students to reflect on this process, what they learned, and what skills they might use in the future.