



The Newell Innovative Teaching Award

The AI Study Buddy: A 24/7 Learning Companion for Oncology Pharmacy Students

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Introduction

Having closely followed generative artificial intelligence (AI) since its mainstream emergence, I integrated AI into my didactic and experiential teaching throughout the 2023-2024 academic year. These initial experiences convinced me that thoughtful AI implementation can significantly enhance critical skills such as content proficiency and technological literacy.

Teaching the 2-credit hour PHRM 769 (Pharmacotherapy VII – Hematology/Oncology) to third-year pharmacy students has become increasingly challenging due to the rapid introduction of novel chemotherapy within an already complicated treatment landscape. I've consistently observed talented students struggle to comprehend the required information within our limited timeframe. This prompted me to envision how "just-in-time learning" through 24/7 access to a digital content expert could transform the educational experience.

This persistent challenge, combined with my understanding of AI's potential, led me to develop "[Chemosabe](#)," an AI chatbot tailored explicitly for the Pharmacotherapy VII course. The name "Chemosabe" is a play on "kemosabe" from The Lone Ranger, meaning "trusted friend." Unlike general AI integrations, Chemosabe underwent rigorous validation as a domain-specific educational tool, addressing students' critical need for personalized learning support while developing essential AI literacy skills.

Project Overview

Development Phase: Creating "Chemosabe"

The development of Chemosabe began in the summer of 2024 with careful curation of instructional content, including personal lecture materials, open-source treatment guidelines, clinical practice protocols, and supportive care examples. These resources formed the basis of a customized GPT model on OpenAI's platform. I enabled web search capabilities for accessing up-to-date treatment guidelines and included specific instructions enabling Chemosabe to generate educational materials, clarify vague questions, provide concise answers, create structured quizzes, and utilize Socratic questioning techniques when appropriate.

The model was calibrated to prioritize course content while presenting information at an appropriate level for third-year pharmacy students. This careful design ensured Chemosabe could provide accurate, relevant, and understandable explanations whenever and wherever students needed guidance.

Validation Process: Ensuring Educational Quality

Prior to implementation, I subjected Chemosabe to a comprehensive validation process led by a six-member panel consisting of three clinical oncology pharmacists and three fourth-year pharmacy students with advanced oncology rotation experience. In the fall of 2024, this panel carefully crafted over 200 test prompts covering over 50 key course objectives, then thoroughly evaluated Chemosabe's outputs using a standardized 5-point Likert scale rubric to assess accuracy, relevance, and depth of response. This validation process yielded exceptional results: 4.97/5.0 for accuracy, 4.90/5.0 for relevance, and 4.77/5.0 for depth of response.

Implementation in PHRM 769

In December 2024, students were given a structured 30-minute orientation introducing Chemosabe. This optional demonstration covered effective prompt engineering, critical evaluation strategies, and ethical AI use. In January 2025, students were provided continuous (24/7) access via a secure OpenAI web platform. Throughout the course, I offered suggested prompts to illustrate use cases, generate quiz questions, and provide optional clinical scenarios to enhance the required coursework. Students were continuously reminded that the chatbot complemented, rather than replaced, traditional learning methods. They were encouraged, but not required, to interact with it.

Assessment Approach

For all 27 students enrolled in my Spring 2025 PHRM 769 course, I administered pre- and post-intervention surveys. Response rates were 81.5% for the pre-intervention survey and 96.3% for the post-intervention survey. These voluntary surveys assessed comfort and confidence with AI tools, perceived reliability, attitudes toward AI integration, usage patterns, impact on oncology content comprehension, experience with information accuracy, and overall educational value. The anonymity of surveys encouraged honest student feedback, while consistent metrics allowed for direct pre-post comparisons. This structured approach to development, validation, implementation, and

assessment ensured Chemosabe represented a carefully designed educational innovation with robust evidence for evaluating its impact on student learning and overall perceptions.

How is this Different?

The innovation of Chemosabe lies not in changing classroom activities, but in transforming how students approach knowledge acquisition beyond the classroom walls. As AI adoption in education and healthcare begins to accelerate, future pharmacists must develop proficiency with digital tools to keep pace with the rapidly evolving landscape.

Specifically, Chemosabe differs from traditional educational approaches in three fundamental ways:

1. **Expert-Validated Adaptive Learning:** Chemosabe uses a cognitive apprenticeship model, delivering content carefully tailored to students' current learning levels. Its performance underwent careful validation by a panel, who assessed over 200 outputs for accuracy, relevance, and depth. This approach shifts from traditional "one-size-fits-all" learning resources to adaptive scaffolding that ensures students receive high-quality, reliable, and appropriately leveled educational content.
2. **Continuous Learning Support:** Chemosabe transforms the traditional constructivist learning paradigm by offering continuous, on-demand access to personalized, expert-level guidance. This represents a shift from time-bound, faculty-centered instruction to a self-regulated learning environment where students control their learning pace and depth. I believe as AI continues to improve, this model of immediate, responsive educational assistance will become increasingly valuable.
3. **Dual-Skill Development:** Rather than employing the traditional siloed approach that separates domain knowledge from professional skills development, Chemosabe implements an integrated learning model. Students concurrently develop deeper understanding of complex oncology content while building critical information literacy skills in evaluating AI-provided information. This approach recognizes the reality of modern professional practice, where knowledge increasingly exists and is distributed across networks and systems rather than solely within individuals.

Success of the Project and Potential Improvements

The Chemosabe project demonstrated remarkable success based on post-intervention survey results. An overwhelming 96% of students reported that the chatbot met or exceeded their expectations, with 65% indicating it exceeded or greatly exceeded expectations. Despite being completely voluntary, nearly all students routinely engaged with the tool.

Students gave overwhelmingly positive feedback about their experience with Chemosabe. The evidence for the chatbot's educational impact was particularly compelling: 84.7% of students agreed or strongly agreed that the chatbot was more effective than traditional resources alone, and 92.4% would recommend the chatbot for future students. The chatbot received exceptional usability ratings, with 96.2% of students finding it easy to use. Even more impressively, 100% of students agreed or strongly agreed that AI tools both help them understand complex medical topics and enhance their learning experience. Students' trust in the chatbot's reliability was also notable, with 96% reporting either no hallucinations (38%) or only rare occurrences.

While successful as a voluntary resource, the primary opportunity for improvement is integrating the AI chatbot into required learning assignments. This would ensure systematic engagement across all students and provide more structured opportunities to develop AI literacy alongside content mastery. Additional improvements could include developing better mechanisms to connect chatbot usage patterns with classroom instruction, allowing for more responsive teaching adjustments, and expanding the model to include interprofessional scenarios that better prepare students for team-based pharmaceutical care.

The most significant finding was that students reported using the chatbot not only for clarification of difficult concepts but increasingly for knowledge extension—exploring clinical applications beyond course requirements. This suggests that well-implemented AI tools not only support required learning but can foster intellectual curiosity and self-directed exploration. Moving forward, I plan to expand this approach to other complex therapeutic areas while developing more formal assessment strategies for measuring the impact of AI integration on learning outcomes.



Union University College of Pharmacy "Chemosabe" AI Chatbot Survey Results

#	Survey Question	Pre-Mean	Post-Mean	% Change	Key Finding
1	How comfortable are you with using AI technologies for educational purposes?	3.05 (SD: 0.82)	3.77 (SD: 0.80)	+23.6%	Significant increase in comfort using AI (p<0.01)
2	How confident are you in your ability to critically evaluate information provided by AI tools?	3.05 (SD: 0.77)	3.65 (SD: 0.68)	+19.8%	Significant increase in confidence evaluating AI (p<0.01)
3	AI tools can enhance my learning experience	4.14 (SD: 0.69)	4.54 (SD: 0.50)	+9.7%	Significant increase in perceived value of AI (p<0.05)
4	AI can provide accurate and reliable information in healthcare education	3.36 (SD: 0.71)	4.19 (SD: 0.48)	+24.6%	Largest improvement; significant increase in trust of AI information (p<0.01)
5	I am concerned about the ethical implications of using AI in education	3.23 (SD: 0.90)	2.92 (SD: 1.24)	-9.4%	Decrease in ethical concerns, though not statistically significant (p>0.05)
6	Using AI tools can help me understand complex medical concepts	4.14 (SD: 0.69)	4.39 (SD: 0.49)	+6.0%	Increase in perceived utility for complex concepts (p>0.05)
7	I am open to integrating AI into my study routine	4.27 (SD: 0.62)	4.54 (SD: 0.63)	+6.2%	Increased openness to AI integration, though not statistically significant (p>0.05)
Post-Intervention Only Questions					
8	Using the chatbot increased my engagement with the course material	4.04			Strong agreement that chatbot increased course engagement
9	The chatbot helped me learn more effectively than traditional resources alone	4.19			Strong preference for chatbot over traditional resources
10	I would recommend the chatbot as an effective learning tool for future cohorts	4.39			High likelihood of recommending to future students
11	The chatbot provided accurate information	4.15			Strong agreement on information accuracy
12	The chatbot's responses were relevant and appropriate for my prompts	4.39			High relevance and appropriateness of responses
13	The chatbot was easy to use	4.46			Highest rated aspect: excellent usability
14	I trusted the information provided by the chatbot	4.15			Strong trust in chatbot information
15	The chatbot complemented other learning resources effectively	4.39			Excellent integration with existing resources
16	After using the chatbot, I am more open to using AI tools in education	4.42			Strong increase in openness to AI after intervention
17	I believe AI tools like the chatbot can significantly enhance pharmacy education	4.31			Strong belief in AI's potential to enhance pharmacy education
18	How frequently did you experience AI hallucinations?	Never: 38%, Rarely: 58%, Sometimes: 4%			96% reported either no hallucinations or only rare occurrences
19	Did the chatbot meet your expectations as a learning tool?	Met: 35%, Exceeded: 46%, Greatly exceeded: 19%			100% met or exceeded expectations; 65% exceeded expectations

*Pre-survey n=22, Post-survey n=26

*Scale for questions 1-2: 1=Not at all, 2=Slightly, 3=Moderately, 4=Very, 5=Extremely

*Scale for questions 3-17: 1=Strongly disagree, 2=Disagree, 3=Neutral, 4=Agree, 5=Strongly agree