Interpreting the AI Rx: Student Pharmacists' Perspectives on Chatbots in Education

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BACKGROUND

- Generative artificial intelligence (AI) chatbots, such as ChatGPT, have the potential to transform the education of healthcare professionals. The integration of AI chatbots into curricula has been the center of heated debate on the future of healthcare education.[1,2]

Pros

- Provides rapid information and study materials
- Easily customizable to individual student needs
- Accessible, user-friendly interface for some chatbots
- Active feedback can enhance writing skills

Cons

- Unclear credibility of sources; potential for bias
- Possibility of inaccurate, irrelevant information; "hallucinations"
- Quality of information dependent on user input and chatbot version; learning curve for efficient use

- Previous studies evaluating the attitudes and perceptions of healthcare students towards AI chatbots have found mixed results.[3,4]
- Evaluating the attitudes and perceptions of pharmacy students can provide guidance on responsible AI integration addressing knowledge gaps, misconceptions, and concerns.

OBJECTIVE

To assess the perceptions and attitudes of student pharmacists toward the integration of large language model (LLM) AI chatbots in pharmacy education and examine if prior experience with chatbots yields more positive perceptions.

METHODS

- Based on the validated TAME-ChatGPT tool,[3] a 36-item survey was designed to assess pharmacy students' acceptance and use of AI chatbots. Predefined sub-scales were used to evaluate perceived usefulness, ease of use, risk of use, anxiety, attitude toward the technology, social influence, and behavioral factors.
- Disseminated via Qualtrics Nov 01-10, 2023 to pharmacy students at Purdue University and the Medical University of South Carolina (MUSC)

Participant Pool

Purdue	MUSC
• 138 P2 students • Previously completed an assignment using a chatbot to answer a DIQ	• 137 P1 and P3 students • Did not complete an assignment using chatbots

RESULTS

- A total of 234 students completed the survey; response rate 85.1% (234/275)
  - 123 students from Purdue (52.6%) and 111 from MUSC (47.4%)
- The median age of respondents was 22 years (IQR 21-24) and 89 (38.0%) had a Bachelor's degree or higher.

Figure 1. Chatbot experience of study sample (N=234).

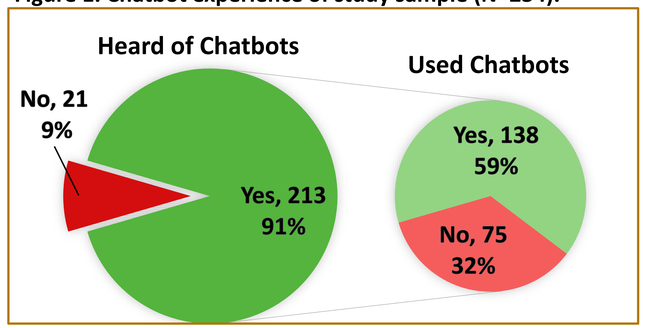


Table 1. Descriptive statistics of the survey sub-scales in the study sample (N=234).

	Attitude Scale (n=213)*			Usage Scale (n=138)†			
Sub-Scale	**Perceived Risk[a]**	**Anxiety[b]**	**Technology/ Social Influence[c]**	**Perceived Usefulness[d]**	**Behavior/ Cognitive Factors[e]**	**Perceived Risk of Use[f]**	**Perceived Ease of Use[g]**
Mean ± SD	9.9 ± 3.5	7.7 ± 3.5	15.7 ± 4.1	16.7 ± 4.6	6.8 ± 2.9	6.3 ± 2.5	8.6 ± 1.7
Median	9	7	16	16	6	6	9
Minimum	5	3	5	6	3	3	2
Maximum	23	15	25	30	15	13	10
IQR	7 –12	5 – 10	12.5 – 18	14 – 20	4 – 9	4 – 8	8 – 10
Attitude‡	Negative	Negative	Positive	Negative	Negative	Negative	Positive

*Scale consisted of 13 items and answered by all respondents who had heard of chatbots previously.
†Scale consisted of 23 items and answered by all respondents who had used chatbots previously.
‡Overall attitude based on the mean score; higher scores within the range of each sub-scale indicate positive perceptions and attitudes toward chatbots.
[a]6-item sub-scale, score range 5-25 ; [b]3-item sub-scale, score range 3-15; [c]5-item sub-scale, score range 5-15; [d]6-item sub-scale, score range 6-26; [e]3-item sub-scale, score range 3-15; [f]3-item sub-scale, score range 3-15; [g]2-item sub-scale, score range 2-10.

Figure 2. Survey sub-scale results of Purdue and MUSC respondents.

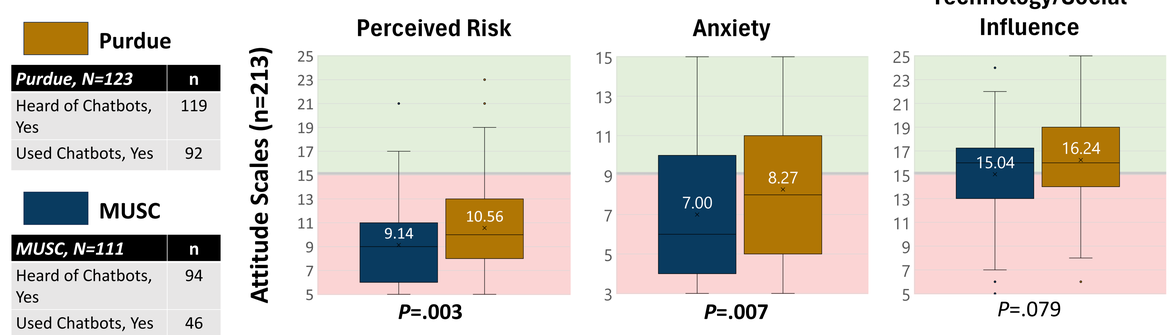
Descriptive analyses of survey sub-scales stratified by school of pharmacy (Purdue students had previously used AI chatbots in a classroom assignment, and MUSC students had not). Positive attitude scores are highlighted in green, negative attitude in red, and neutral attitude in gray. Differences between groups were assessed using the chi-square test at a significance level of P=.05. Mean scores per group are presented on graphs.

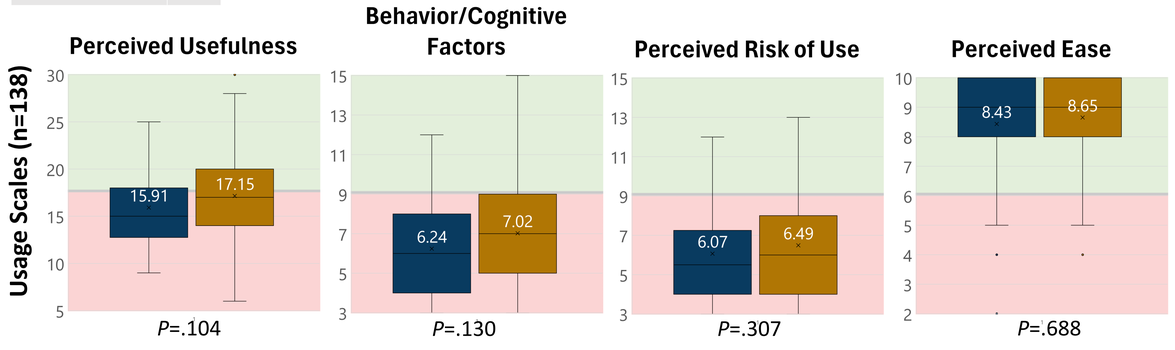
Purdue

Purdue, N=123	n
Heard of Chatbots, Yes	119
Used Chatbots, Yes	92

MUSC

MUSC, N=111	n
Heard of Chatbots, Yes	94
Used Chatbots, Yes	46





CONCLUSIONS

- The majority of student pharmacists have heard of and used AI chatbots prior to this study.
- Overall, student pharmacists negatively view chatbot-integration in pharmacy curricula, despite positive perceptions regarding ease of use and the technological progress exemplified by AI chatbots.
- Less negative scores from Purdue students who had completed a chatbot assignment suggest that guidance from instructors and assigned practice with AI chatbots may improve attitudes and perceptions.
- Next steps include improving the current AI chatbot assignment at Purdue and continuing to explore innovative AI incorporation into pharmacy curricula.

Limitations

- Despite previously using chatbots to complete an assignment, 3.3% of Purdue students said that they had not heard of chatbots, and 21.9% said they had not used them, suggesting confusion among students on what qualifies as a chatbot, as well as issues in self-reporting in this survey.
- This study represents only a snapshot of student opinions and concerns. AI technology and student experiences continue to rapidly evolve.

References

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