




RESEARCH ARTICLE

# Student perceptions of generative artificial intelligence in didactic patient presentations

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## Abstract

**Background:** Limited research exists concerning the integration of Chat-Generative-Pre-trained Transformer (ChatGPT) into didactic pharmacy curricula. This project aimed to evaluate the impact of utilising ChatGPT (GPT 3.5) in the development of patient presentations on student perceptions. **Methods:** Students were given the opportunity to utilise ChatGPT to help organise information included within recorded verbal patient presentations. Following the assignment, students in the second (P2) and third year (P3) pharmacy curriculum completed surveys evaluating perceptions of ChatGPT. **Results:** Surveys were submitted by 51 P2 students and 48 P3 students. No difference was found regarding perceptions of utilising ChatGPT in patient presentations, except for confidence related to succinctly presenting an assessment and plan, and the ability to address patient concerns. Overall, 25/42 (59.5%) P2 and 29/41 (70.7%) P3 respondents felt ChatGPT improved their ability to communicate, 24/42 (57.1%) P2 and 29/41 (70.7%) P3 respondents felt they had improved organisation, and 25/46 (54.3%) P2 and 26/41 (63.4%) P3 respondents felt ChatGPT saved time. **Conclusion:** Students perceived ChatGPT to positively impact their ability to communicate effectively, organise information, and increase confidence in presenting information. This activity highlights a way to encourage students to develop skills in the use of evolving technology while enabling critical thinking.

## Introduction

Pharmacy curricula include various assignments and projects, such as objective structured clinical examinations, role-playing, patient cases, and presentations, to help students develop critical thinking and communication skills. Effective communication with patients and providers is essential for delivering quality care in the pharmacy field, as emphasised by the Accrediting Council for Pharmacy Education (Accreditation Council for Pharmacy Education, 2015; Luiz Adrian *et al.*, 2015). However, pharmacy students often face challenges in developing these two skills (Mesquita *et al.*, 2010; Luiz Adrian *et al.*, 2015; Persky *et al.*, 2019). To overcome these challenges, developing innovative assignments that provide opportunities for critical application while exposing learners to available technology to decrease workload and improve efficiency is paramount for ensuring that pharmacy education produces practice-ready pharmacists.

The National Institute for Learning Outcomes Assessment (NILOA) outlines several characteristics for assignments to be impactful learning experiences. Assignments should be intentionally designed with specific outcomes and able to engage learners through real-world scenarios that capture interest (Hutchings *et al.*, 2014). Moreover, NILOA also emphasises that assignments should be scaffolded with defined expectations and guidance while respecting and reflecting students' current knowledge. These assignments should also be linked to other tasks to create a coherent learning pathway (Hutchings *et al.*, 2014).

Several studies have shown that simulated activities within pharmacy curricula enhance student communication skills and confidence (Mesquita *et al.*, 2010; Luiz Adrian *et al.*, 2015; Quinn & Barnett, 2021). One such study examined the impact of integrating role-playing communication scenarios into a term-long

communication course, demonstrating improvements in oral, written, and public speaking skills as measured using a communication skills rubric and written questionnaires (Luiz Adrian *et al.*, 2015). Another study focused on patient presentations to assess students' level of confidence in delivering patient presentations to preceptors and identify areas for curricular improvement (Quinn & Barnett, 2021). Over the term-long course, students' confidence in presenting patients to pharmacy preceptors increased, while four areas for further emphasis were identified: selecting relevant information, preparing presentations under time constraints, identifying high-priority drug-related problems, and presenting objective information (Quinn & Barnett, 2021). Although many of these skills develop with deliberate practice, incorporating digital technologies into patient presentations could enhance the curriculum and boost student confidence before clinical experiences.

Merging patient presentations with technologies like artificial intelligence (AI) may serve to reduce student concerns related to the preparation and organisation of presentations while still enabling critical thinking opportunities and communication skill development. Chat Generative Pre-trained Transformer (ChatGPT) is an example of AI, with two models available: GPT 3.5, a free text input-based platform, and GPT 4.0, a subscription-based platform able to browse the internet for updated information. Both versions have demonstrated their worth in automating scoring, supporting evidence-based decision-making, providing personalised learning, and helping with documentation (Garg *et al.*, 2023; Khan *et al.*, 2023; Tsang, 2023). In healthcare education and research, ChatGPT has likewise shown value in personalised learning, enhancing productivity, and improving scientific writing (Homolak, 2023; Memarian & Doleck, 2023; Sallam, 2023). However, pertinent limitations of GPT 3.5 in healthcare education include its reliance on pre-2021 information, potential biases in training data, concerns surrounding accuracy and reliability, and its lack of human-like understanding, which can lead to ignoring contextual information (Garg *et al.*, 2023; Memarian & Doleck, 2023; Sallam, 2023).

Prior literature has examined the use of ChatGPT in clinical scenarios, including enhancing decision support tool alerts, aiding in medication therapy management, assisting with simple writing tasks, and addressing clinical case vignettes (Al-Dujaili *et al.*, 2023; Liu *et al.*, 2023; Rao *et al.*, 2023; Ye *et al.*, 2023; Zawiah *et al.*, 2023; Huang *et al.*, 2024; Roosan *et al.*, 2024). Across these diverse tasks, ChatGPT demonstrated good overall reliability (Al-Dujaili *et al.*, 2023; Liu *et al.*, 2023; Rao *et al.*, 2023; Ye *et al.*, 2023; Huang *et al.*, 2024; Roosan *et al.*, 2024). Notably, four of these studies

focused specifically on ChatGPT's use in pharmacy and medication therapy management (Al-Dujaili *et al.*, 2023; Rao *et al.*, 2023; Huang *et al.*, 2024; Roosan *et al.*, 2024).

In one study, GPT 3.5 was given published case vignettes, and multiple-choice questions were utilised to assess its accuracy in diagnosis and therapy management. The model showed an overall accuracy of 71.7%, achieving the highest performance in making final diagnoses but underperforming in differential diagnosis and clinical management tasks, including correct medication dosing (Rao *et al.*, 2023). Another study compared GPT 3.5 to clinical pharmacy experts using 20 pharmacotherapy cases over five weeks. ChatGPT was consistently able to identify at least 70% of the correct answers. The authors concluded that this model could generate clinically relevant pharmaceutical information, with some variations in accuracy and consistency (Al-Dujaili *et al.*, 2023).

Similar results were found when GPT 4.0 was tested on simple, complex, and very complex patient cases to identify medication therapy optimisation opportunities and drug interactions. While this version solved all cases with at least 70% accuracy, more complex cases required additional attempts and specific questions to yield accurate answers (Roosan *et al.*, 2024). In the fourth study evaluating its performance in prescription review and patient education, GPT 4.0 excelled at drug counselling but struggled with other areas, including prescription reviews and recognising adverse drug reactions, owing to its limitations in handling advanced reasoning and complex instructions (Huang *et al.*, 2024).

While these studies demonstrate ChatGPT's fair accuracy and potential for improved efficiency in clinical pharmacy scenarios, they also highlight the need for use in combination with critical thinking from pharmacists or pharmacy students. ChatGPT's lack of reasoning in complex situations and its inability to adjust therapeutic management or provide accurate dosing emphasise the importance of human oversight (Liu *et al.*, 2023; Rao *et al.*, 2023; Ye *et al.*, 2023; Zawiah *et al.*, 2023; Roosan *et al.*, 2024).

ChatGPT's role in clinical healthcare settings has been extensively studied, but limited research has explored its role in didactic healthcare or pharmacy education. Available studies have examined ChatGPT from the educator's perspective, focusing on its use in course and assignment design or as a study aid for exam preparation without assessing student perceptions in the didactic setting (Choi, 2023; Kung *et al.*, 2023; Memarian & Doleck, 2023; Nisar & Aslam, 2023; Al-Worafi *et al.*, 2024). Given AI's strengths and limitations, incorporating ChatGPT (GPT 3.5) into

patient presentations could offer students an effective platform to practice and improve their communication skills while continuing to develop critical thinking and clinical decision-making abilities. This pilot project aimed to evaluate the impact of utilising ChatGPT in creating patient presentations on students' perceptions, confidence, and time spent completing the task. It also sought to assess how students felt about incorporating ChatGPT into the didactic pharmacy curriculum.

## Methods

### Activity overview

At Campbell University College of Pharmacy & Health Sciences (CPHS), patient presentations are one of the curricular activities completed by second- (P2) and third-year (P3) pharmacy students. These presentations help students apply classroom knowledge and further develop their communication skills. Students are given access to an electronic health record platform (Fletcher EMR v.1.1, Fletcher Interactive LLC) with an assigned patient case. They must gather relevant subjective and objective information and use available diagnostic results and notes within the chart to develop an appropriate evidence-based assessment and plan. They must also identify therapeutic recommendations to incorporate into their presentation for each of the patient's problems, which may include medication dosage adjustments, detecting drug-drug interactions, or identifying gaps in medication therapy.

After developing an appropriate plan for the patient, students design a patient presentation to be delivered orally. This presentation is subsequently recorded and submitted for grading and feedback. Presentations are evaluated using a modified single-point rubric divided into three sections: Section one focuses on subjective and objective information, along with presentation organisation; Section two focuses on the assessment and plan; and section three evaluates presentation length and student professionalism.

Students are provided with a guide on how to present a patient, along with an example presentation and a sample rubric, to help them with this assignment. Despite these resources, students often struggle with presentation formatting, which can result in inefficient use of time, added stress, and unclear recommendations. Given ChatGPT's ability to organise information for documentation, yet its limitations in consistently formulating appropriate therapeutic plans, the authors hypothesised that allowing students to use this platform to organise and format their presentations

before recording would boost confidence, save time, and still provide opportunities to develop critical thinking skills when designing therapeutic treatment plans.

### Implementation and evaluation

The use of GPT 3.5 in didactic presentations was piloted during the 2023 Fall term. P2 and P3 students at CPHS were randomly assigned to one of two unique cases created for each cohort and asked to create a patient presentation to be delivered orally. Students were allowed to use GPT 3.5 to help them organise and format their presentations before recording. They also received a brief overview and tutorial on ChatGPT's limitations, functions, and interface.

Following the submission of the patient presentations, a 19-question survey was made available to students to evaluate their perceptions of using ChatGPT. Any P2 or P3 student at CPHS was eligible to complete the survey. Participation in the survey was optional, and all responses were recorded anonymously on Qualtrics, an online platform that enables the creation, distribution, and analysis of surveys and data. Partially and fully completed surveys were included in the analysis. All questions were evaluated on a 7-point Likert scale.

The primary endpoint was to compare P2 and P3 students' perceptions of using ChatGPT to create presentations. Secondary endpoints included comparing the time students reported spending on formatting and creating presentations and identifying trends in student perceptions of effectiveness, time management, organisation, and confidence when using ChatGPT.

All statistical analyses were performed using JMP17-PRO (SAS, Cary, NC). The primary endpoint was analysed utilising Wilcoxon rank sum, endpoints related to time were analysed using the Student T-test, and other secondary endpoints were analysed using descriptive statistics.

## Results

A total of 51 out of 66 (77.2%) P2 and 48 out of 67 (71.6%) P3 students completed the surveys. Most P3 students (83.3%) reported prior experience with ChatGPT, compared to only 35.5% of P2 students. Student perceptions of using ChatGPT for patient presentations, the primary outcome, were evaluated using a 7-point Likert scale, where a score of one indicated strong agreement or familiarity, a score of four represented neutrality, and a score of seven represented strong disagreement or lack of familiarity. Significant differences were observed across several

domains. P3 students reported more familiarity with ChatGPT compared to P2 students (P2: 3.37 ± 1.7 vs P3: 2.63 ± 1.47; *p* = 0.0045). They also expressed higher confidence in their ability to succinctly present an assessment and plan (P2: 2.33 ± 0.76 vs P3: 1.9 ± 0.59; *p* = 0.0106) and address patient needs (P2: 2.23 ± 0.7 vs P3: 1.83 ± 0.55; *p* = 0.0062). Overall, P3 students demonstrated significantly higher levels of familiarity and confidence in using ChatGPT.

Table I summarises the comparison of perceptions between P2 and P3 students. When results were stratified by previous experience with ChatGPT or similar artificial intelligence programmes, no significant differences were found except in confidence regarding the ability to succinctly present an assessment and plan. Students with prior ChatGPT experience were more confident in this area (*p* = 0.0172).

**Table I: Perceptions of utilising ChatGPT in patient presentations**

Questions	P2 – Mean ± SD	P3 – Mean ± SD	P-value
<b>Familiarity/comfort with ChatGPT</b>			
How familiar were you with ChatGPT prior to this assignment?†	3.37 ± 1.7	2.63 ± 1.47	<b>0.0045</b>
How comfortable were you using ChatGPT to create patient presentations?‡	3.5 ± 1.76	3.37 ± 1.56	0.892
<b>Effectiveness &amp; communication</b>			
Compared to creating traditional patient presentations without ChatGPT, how much time did using ChatGPT save you in preparing for patient presentations overall?^	3.11 ± 1.1	2.88 ± 1.31	0.2677
How effective do you feel your patient presentation was at communicating pertinent and appropriate information?¥	5.69 ± 1.6	5.85 ± 1.11	0.8078
To what extent do you agree or disagree that using ChatGPT to create patient presentations improved your ability to effectively communicate information?^^	3.05 ± 1.51	2.92 ± 1.29	0.8849
Compared to creating patient presentations without to what extent did using ChatGPT improve your ability to organise and structure patient information?«	3.1 ± 1.23	2.83 ± 1.02	0.3709
Compared to creating patient presentations without ChatGPT, to what extent did using ChatGPT improve your ability to use appropriate medical terminology and language?«	3.21 ± 1.32	2.95 ± 1.12	0.4321
<b>Confidence</b>			
How confident are you in your ability to organise and structure patient information during a patient?~	2.1 ± 0.55	2.13 ± 0.82	0.7499
How confident are you in your ability to succinctly present an assessment and plan?~	2.33 ± 0.76	1.9 ± 0.59	<b>0.0106</b>
How confident are you in your ability to address patient needs and concerns during a patient presentation?~	2.23 ± 0.7	1.83 ± 0.55	<b>0.0062</b>
How confident are you in your ability to provide appropriate recommendations and interventions to healthcare providers based on patient information shared during a patient presentation?~	2.38 ± 0.95	2.23 ± 0.8	0.6108
How confident are you in your ability to use the skills you learned from using ChatGPT to create patient presentations in real-life interactions?~	2.93 ± 1.42	2.68 ± 1.07	0.5616
<b>Overall perceptions</b>			
How realistic were patient presentations generated by ChatGPT?††	2.79 ± 0.83	2.86 ± 1.14	0.6782
To what extent do you agree or disagree that using ChatGPT to create patient presentations should be incorporated into pharmacy education and training programmes?^^	3.15 ± 1.2	3.05 ± 1.35	0.5131

A seven point Likert scale was used for all questions. † 1:extremely familiar, 2: mostly familiar, 3: familiar, 4: neither familiar or unfamiliar, 5: unfamiliar, 6: mostly unfamiliar, 7: not familiar at all; ‡ 1:very comfortable, 2: mostly comfortable, 3: slightly comfortable, 4: neither comfortable or uncomfortable, 5: slightly uncomfortable, 6: mostly uncomfortable, 7: not comfortable at all; ^ 1: saved significantly more time, 2: saved more time, 3: saved slightly more time, 4: no difference in time, 5: added slightly more time, 6: added more time, 7: added significantly more time; ¥ 1: very ineffective, 2: ineffective, 3: somewhat ineffective, 4: neither ineffective or effective, 5: somewhat effective, 6: effective, 7: very effective; ^^ 1: strongly agree, 2: agree, 3: somewhat agree, 4: neither agree or disagree, 5: somewhat disagree, 6: disagree, 7: strongly disagree; « 1: greatly improved, 2: improved, 3: slightly improved, 4: no effect, 5: slightly decreased, 6: decreased, 7: greatly decreased; ~ 1: completely confident, 2: mostly confident, 3: slightly confident, 4: neither confident or unconfident, 5: slightly unconfident, 6: mostly unconfident, 7: not confident at all; †† 1: very realistic, 2: realistic, 3: somewhat realistic, 4: neither realistic or unrealistic, 5: somewhat unrealistic, 6: unrealistic, 7: very unrealistic

Regarding the secondary endpoint comparing student-reported time, P2 students spent significantly more

time formatting and organising their presentations (P2: 141.6 ± 15.5 minutes vs P3: 98.1 ± 13.4 minutes;

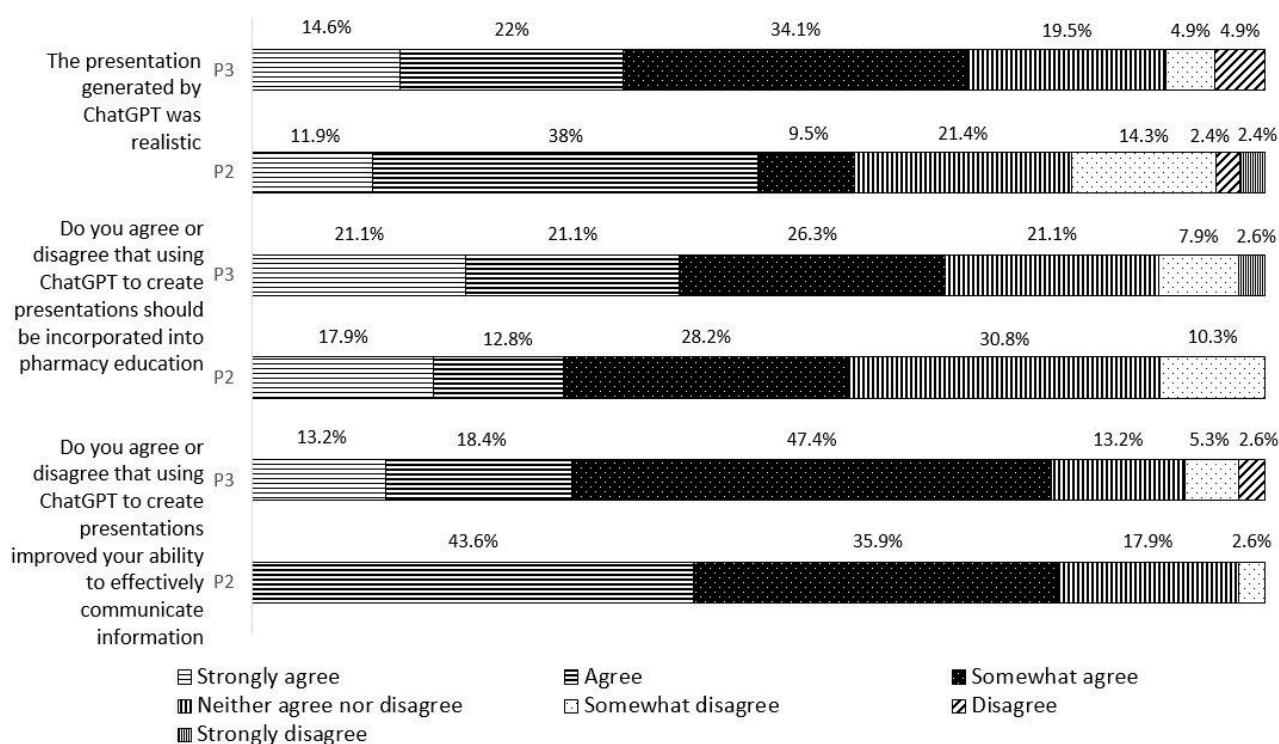
$p = 0.0369$ ) and more time overall (P2:  $264.4 \pm 23.4$  vs P3:  $195.4 \pm 20.2$ ;  $p = 0.0281$ ). When examining student perceptions of effectiveness, the majority felt their presentations effectively communicated information (P2: 32/42, 76%; P3: 33/41, 80.5%) and agreed that using ChatGPT improved their ability to communicate (P2: 25/42, 59.5%; P3: 29/41, 70.7%).

In terms of time savings, 25/46 (54.3%) of P2s and 26/41 (63.4%) of P3s felt ChatGPT saved time, while 18/46 (39.3%) of P2s and 12/41 (29.3%) of P3s reported no impact on the total time spent. Regarding the organisation and structure of their presentation, 24/42 (57%) of P2s and 29/41 (70.7%) of P3s felt ChatGPT

improved these aspects compared to creating presentations without it. Confidence levels were high across both groups, with over 80% of P2 and P3 students feeling mostly or completely confident in organising and structuring patient presentations, succinctly presenting an assessment and plan, and providing appropriate recommendations.

Finally, when asked whether ChatGPT should be incorporated into pharmacy education, 23/39 (58.9%) of P2s and 26/38 (68.4%) of P3s agreed that it should be incorporated.

Figure 1 illustrates the overall trends in perceptions of ChatGPT for P2 and P3 students.



This figure highlights the overall perceptions of students in the P2 and P3 cohorts with respect to utilisation of ChatGPT in patient presentations and pharmacy curriculum. Most students agreed that presentations were realistic, ChatGPT should be incorporated into pharmacy education, and that using ChatGPT improved their abilities to communicate information effectively across both P2 and P3 cohorts.

**Figure 1: Overall perceptions of ChatGPT**

**Discussion**

This pilot project examined the perceptions of P2 and P3 students in using ChatGPT (GPT 3.5) as a formatting tool for patient presentations and demonstrated ChatGPT’s utility in assisting with data organisation and formatting. Despite significant differences in prior experience between the two cohorts, overall perceptions of ChatGPT were consistent regarding its effectiveness, communication support, confidence-

building, and potential integration into the pharmacy curriculum. Both groups found ChatGPT helpful in organising information and improving communication skills. These results align with those of a previous study where ChatGPT was used to generate an organised report from two video transcripts on patient presentation and management (Ye *et al.*, 2023). This study reported ChatGPT’s reliability in organising and presenting information, although it required specific and detailed inputs to produce the final report (Ye *et*

al., 2023). Similarly, students in this project had to input data from the electronic health records, along with their assessment and plan, into ChatGPT to receive formatting assistance.

The two areas where significant differences emerged between P2 and P3 student perceptions were related to confidence. P3 students were significantly more confident in their ability to succinctly present an assessment and plan, as well as address patient-specific needs. This difference may be explained by the higher degree of experience with patient presentations, clinical material, and ChatGPT use in the P3 cohort. Although both groups perceived that using ChatGPT saved time, a significant difference was also seen in the time required to format and organise and the overall time spent on presentations between the two cohorts, with P2 students taking significantly longer. Several reasons may explain this difference in time, such as the level of experience in using ChatGPT and creating patient presentations, assignment value, and completing patient presentations in different courses.

Most available literature on ChatGPT within pharmacy education has focused on its application in clinical practice settings, with little emphasis on student perceptions or its role in didactic education. Studies examining its use in clinical scenarios consistently report the ability of ChatGPT to achieve an accuracy rate of 70% or higher, while also highlighting limitations in dosing and therapeutic recommendations (Al-Dujaili et al., 2023; Rao et al., 2023; Huang et al., 2024; Roosan et al., 2024). These findings suggest that while ChatGPT can improve efficiency in clinical practice, it cannot replace the expertise of a clinician (Al-Dujaili et al., 2023; Rao et al., 2023; Huang et al., 2024; Roosan et al., 2024). This pilot project builds on these insights by examining student perceptions of ChatGPT as an assistant or resource in organising and formatting information clinical recommendations, thus leveraging its strengths while avoiding its limitations.

This project revealed that a significant percentage of both P2 and P3 students supported incorporating ChatGPT into the pharmacy curriculum, recognising its potential benefits. These perceptions align with findings from a previous study that examined student views, concerns, and experiences regarding the integration of ChatGPT into clinical pharmacy education (Zawiah et al., 2023). In that study, 65.9% of the 211 respondents believed pharmacy students could benefit from ChatGPT. Similar to the present findings, students more familiar with ChatGPT were more likely to perceive its incorporation as beneficial (Zawiah et al., 2023).

Although both P2 and P3 students in the current study acknowledged the positive impact of ChatGPT, a larger

proportion of P3 students—who had more experience using the platform—reported that it improved their presentations. This study also highlighted student concerns with the incorporation of ChatGPT, including a lack of personal interaction, over-reliance on technology, issues related to accuracy and reliability, limited contextual understanding, and constrained scope of knowledge (Zawiah et al., 2023). While most students agreed that ChatGPT has a role in pharmacy education, these concerns highlight the importance of balancing this technology with collaborative human decision-making and ensuring that its intentional use preserves the aspects of patient care that technology cannot provide.

### **Limitations**

This project has several limitations. The surveys were distributed by instructors during the course, which could introduce survey bias. Additionally, both partially and fully completed surveys were included in the results, potentially skewing overall perceptions of questions with fewer responses. Students were also not required to use ChatGPT, which may have influenced overall student perceptions. Finally, this pilot project focused solely on student perceptions and did not assess the quality of the presentations or compare perceptions with assignment grades. Future research should address these gaps by evaluating presentation quality and comparing student perceptions with performance. Additionally, examining the roles of AI within didactic pharmacy and health sciences curricula across multiple programmes and conducting longitudinal studies could improve the generalisability of results. Comparing perceptions and performance across different AI platforms within didactic education may also help determine the most beneficial tools for learners.

### **Implications for pharmacy education and broader health sciences**

This project serves as an example of how ChatGPT can be integrated into education beyond its well-established use in clinical settings. While this study specifically addresses pharmacy education, its findings have broader implications for health sciences education, demonstrating the potential for AI tools to enhance learning across various disciplines.

As AI continues to evolve, adapting pharmacy education to include such tools is crucial for preparing practice-ready pharmacists with the required skills to provide efficient and evidence-based care. Integrating AI into patient presentations as a formatting and organisational aid supports the development of critical thinking skills while familiarising students with

technologies that will be available in their professional practice. Introducing this technology within the didactic curriculum also ensures dedicated time for discussing ethical uses and limitations to promote understanding and appropriate use in patient care and pharmacy practice.

## Conclusion

This pilot project highlights the potential of using ChatGPT (GPT 3.5) in the didactic curriculum to enhance student's ability to organise information and present recommendations before engaging in clinical learning experiences. Overall, students found ChatGPT beneficial for creating patient presentations, particularly in improving effective communication, presentation organisation, and time management. The majority also agreed that ChatGPT should be incorporated into pharmacy education.

## Ethics approval and informed consent

This project received IRB approval from Campbell University (IRB protocol #836). The IRB determined informed consent was not required as the research activities present minimal risk to subjects and do not involve procedures for which written consent is typically required outside the research context.

## Conflict of interest

The authors declare no conflict of interest.

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