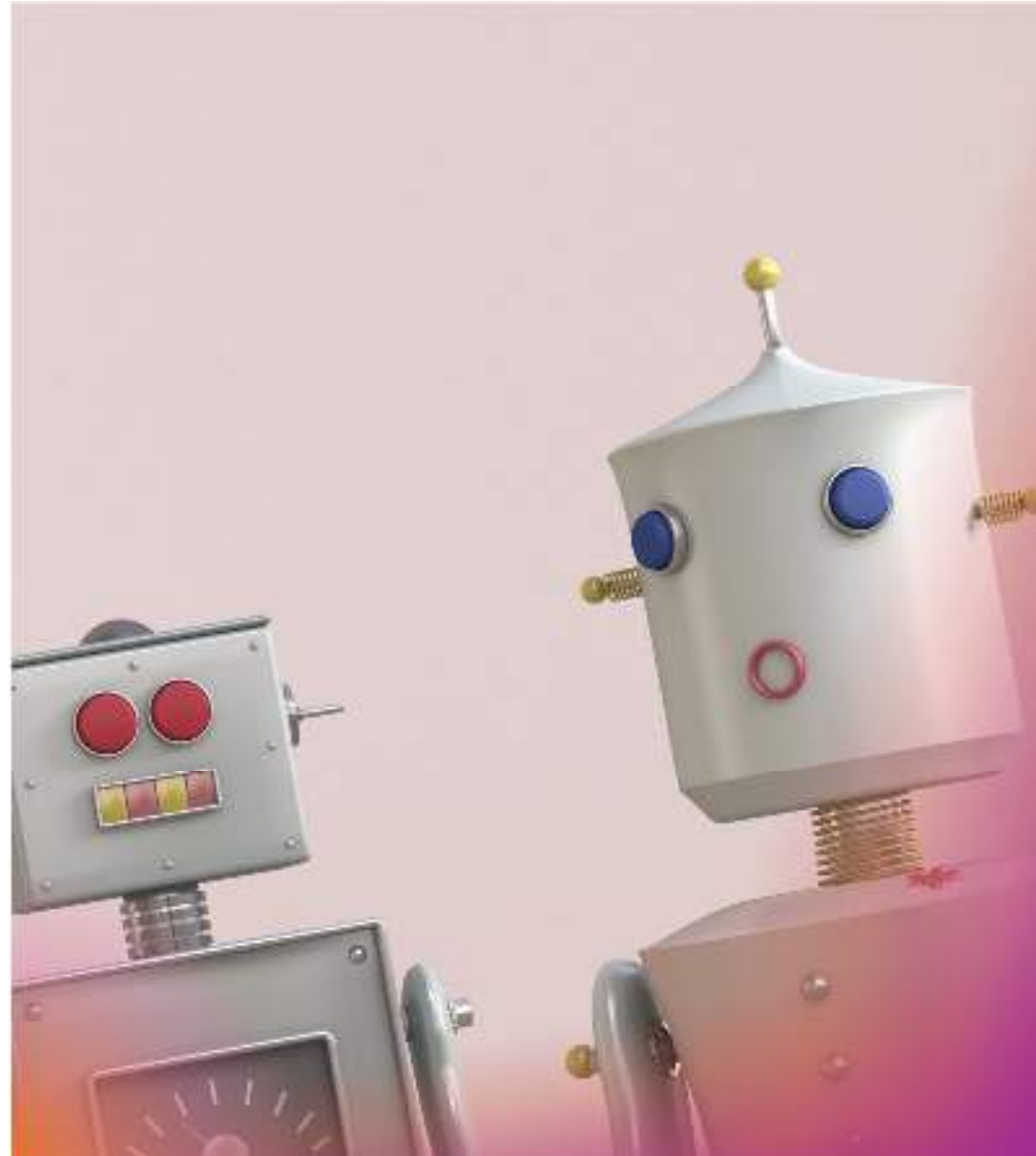


# From Data to Dialogue: Transforming Feedback with AI Bots

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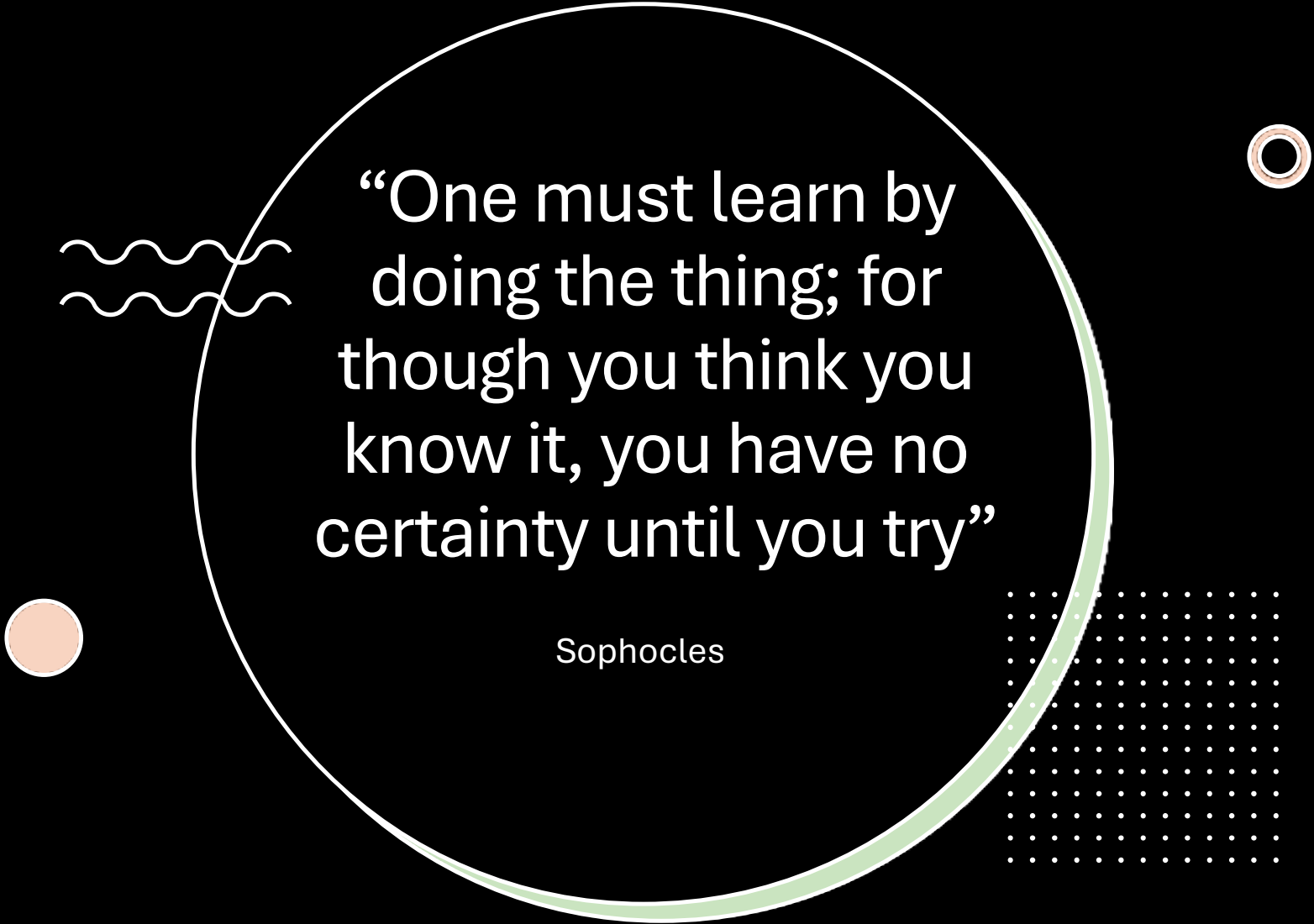
Binghamton University School of Pharmacy  
and Pharmaceutical sciences



# Objectives

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- Describe how AI bots can be integrated into education workflows to generate timely, consistent, and personalized learner feedback
- Evaluate the benefits and best practices of using AI assisted tools to enhance feedback quality and support
- Identify limitations of using AI assisted tools to enhance feedback quality and support
- Apply ethical, privacy, and human oversight principles when using AI tools to generate and refine learner feedback in educational settings



“One must learn by  
doing the thing; for  
though you think you  
know it, you have no  
certainty until you try”

Sophocles



# Importance



Support skill  
development



Reinforces  
expectations



Identifies strengths  
and improvements



Promotes reflective  
practice

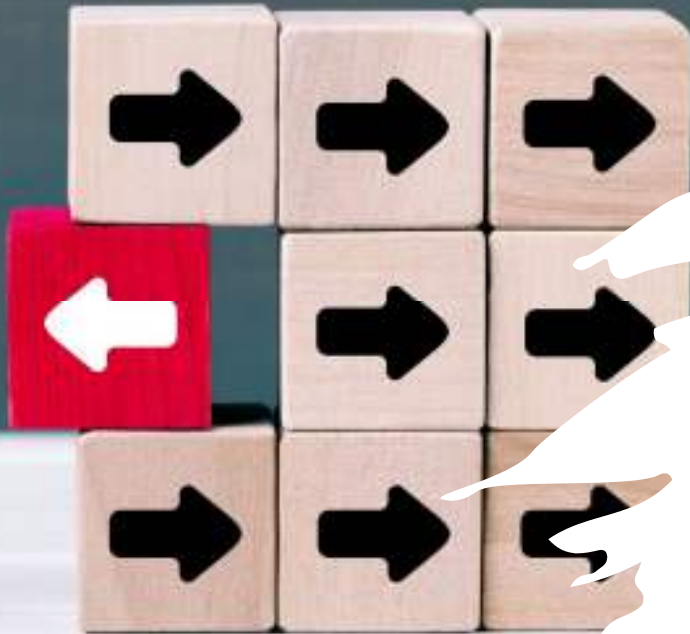


# Preceptor Application

- High stakes learner feedback
- Time constraints limit depth and specificity
  - Most preceptors take on at least 3 learners per year
    - 3 midpoints
    - 3 final evaluations
- Inconsistent feedback impacts learner growth and assessment reliability
- AI tools can support efficient drafting and reflection prompts
  - Average evaluation can take up to 30-60 minutes
  - AI assisted drafting reduces this in half

# Hallmarks of Effective Feedback

- Timely
- Specific
- Measurable and actionable
- Balanced
- Learner-centered





# Current Challenges



Time Constraints



Inconsistency across evaluators



Limited Specificity



Impact on learner development



# Current Landscape

Opportunity to support, not replace

Rapid emergence of AI tools

Growing educator interest

Limited training and guidance




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## Question

Which of the following best describes the appropriate role of AI tools in generating learner feedback in educational settings?

- A. AI tools should replace educator feedback to ensure consistency
- B. AI tools can assist with drafting feedback but require human review and oversight
- C. AI tools should only be used for grading numerical assessments
- D. AI tools eliminate the need for preceptor observations



# Unraveling the mechanisms and effectiveness of AI-assisted feedback: A systematic literature review

- 129 peer reviewed journal articles
- Thirteen studies also confirmed the positive relationship between AIFB and learners' self-efficacy and confidence.
- AI-assisted and actionable perceptions centered on actionable learning experiences with AI-assisted tools (e.g., attention and engagement), with 21 studies reporting favorable experiences.

# Directive Feedback

- Directly improves actions
- Identifies errors
- Suggestions for revision





# Metacognitive Feedback

- Explains the how and why
- Step wise approach
  - Pre-assessment
  - Regulatory Check list
    - Planning
    - Monitoring
    - Evaluating
  - Reflection



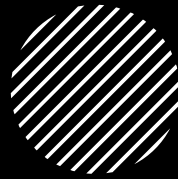


# Metacognition Limitations

- Reliance on self assessment
- Error due to familiarity
- Foresight bias



# Understanding AI Assisted Feedback



- Consistency and timeliness
- Learner engagement benefits
- Potential to reduce workload



# Workflow



Preceptor observes learner performance



Brief notes entered into AI tool



AI drafts structured feedback



Preceptor reviews and edits



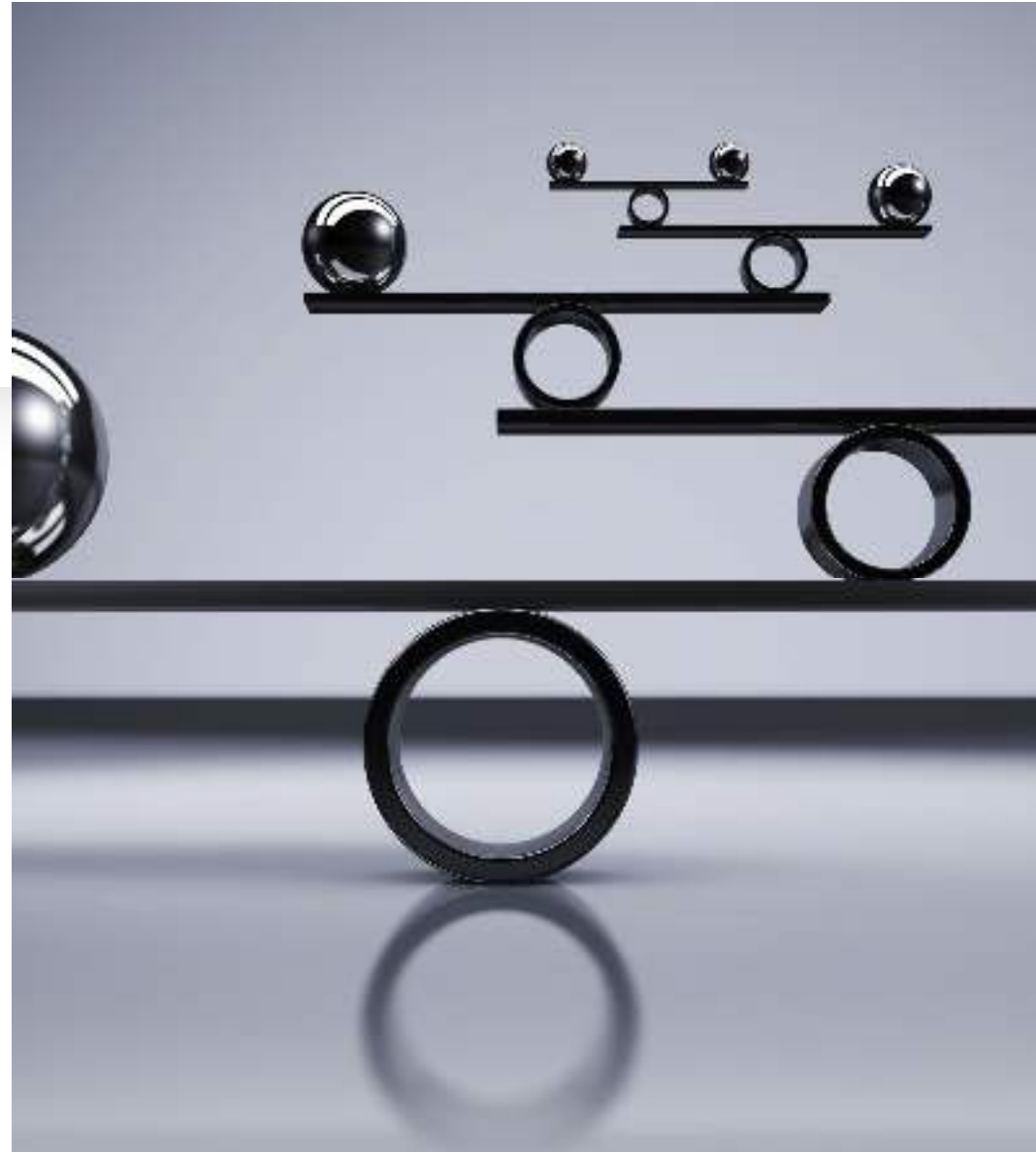
Feedback delivered to learner



Learner reflection prompted

# Strengths

- Generative
- Adjusts tone and professionalism
- Organize observations
- Align with competencies



# Opportunities and limitations

- Requires clear prompts
- May lack context
- Risk of inaccuracies
- Requires human oversight
- Institutional privacy policies may vary
- Generic responses



# Overview of tools

<b>Tool</b>	<b>Strength</b>	<b>Limitation</b>
ChatGPT	Flexible prompts, strong narrative generation	Requires careful prompt design
Copilot	Integration with Microsoft workflows	Less customizable
Institutional bots	Privacy control, tailored prompts	Limited training data

# Tools

Gemini	Microsoft Copilot	ChatGPT	Claude
Chat	Chat	Chatbot customization	Chatbot
Coding	Search	Code Generation	Code Generation
Writing	Writing	Writing	Writing
Data An	Data Analysis	Data Analysis	Data Analysis
Image and Text Generation	Image and Text Generation	Image and Text Generation	Image and Text Generation
Deep Research	Deep Research	Summarizing, Editing	Deep Research
Translation	Translation	Translation	Translation

# Choosing the Right Tool

- Narrative feedback
- Rubric Based feedback
- Performance summaries
- Workflow integration



# Ethical and Professional Considerations



PRIVACY AND  
CONFIDENTIALITY



ACCURACY  
VERIFICATION



VOICE



RESPONSIBLE  
USE

# Anatomy of an Effective Prompt



Clear learner  
performance  
description



Tone



Outcome alignment



Level of Detail

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# Harvard's Recommendations

- Be specific
- Act as if
- Tell it how you want your output to be presented
- Use do's and don'ts
- Give examples
- Build on previous prompts
- Correct mistakes and give feedback



# Prompt template

**You are a pharmacy preceptor providing professional feedback.**

**Learner performance:**  
[brief observation]

**Competency area:**  
[communication / clinical reasoning / professionalism]

**Write constructive feedback that:**

- acknowledges strengths
- identifies a specific improvement
- provides an actionable suggestion
- maintains a supportive tone

# Example of a prompt template

**You are a pharmacy preceptor providing professional feedback.**

**Learner performance:**

The student has completed 5 medication reconciliation events. The student noted 10 inaccuracies on the med list; however, only created action on 5.

**Competency area:**

The student was able to successfully identify diabetes and hypertension interventions but struggled with pulmonary topics. I would recommend the student review COPD and asthma to identify appropriate therapy and medication regimens for this group.

**Write constructive feedback that:**

- acknowledges strengths
- identifies a specific improvement
- provides an actionable suggestion
- maintains a supportive tone



# Hallucinations

- Definition:
  - AI hallucinations occur when an AI system generates information that appears plausible but is incorrect or fabricated.
  - Nonsensical
- Prevention:
  - Limit responses
  - Test and refine system
  - Oversight



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## Question

Which element is most important when creating a prompt for AI-generated learner feedback?

- A. Using the longest possible prompt
- B. Including a clear description of learner performance and desired tone
- C. Avoiding specific examples
- D. Asking the AI to generate feedback without context



## Improvement

- Specificity
- Constructiveness
- Professional Tone

# Clinical Judgement Example

Please help with feedback for this p4 learner: Student missed several drug-disease interactions when reviewing the profile."

Before I generate the comment, I just need two quick details to align it with the evaluation expectations:

1. Is this for a formative (midpoint) or summative (final) evaluation?
2. What future supervision level (1-5) would you feel comfortable providing for this activity? (APPE target is typically Level 3 – reactive supervision.)

📄 👍 🗨️ ...

This is for the midpoint and I would feel comfortable with a level 1

⚠️ Reminder: Do not include any personally identifiable student information (FERPA) or protected patient health information (HIPAA). Use general descriptions only.

#### Medication Profile Assessment / Clinical Reasoning:

[Student] is developing skills in reviewing medication profiles but missed several drug-disease interactions during evaluation of the patient profile, indicating the need for closer guidance when assessing medication safety. This performance is **below the expected autonomy for an APPE learner**, and continued direct supervision is appropriate while strengthening a systematic approach to reviewing comorbidities, medication indications, and contraindications. Next step: practice structured profile reviews using drug-disease screening resources and verbalize clinical reasoning during case discussions to improve consistency and accuracy.

## Communication Example

You're welcome! 😊

If you have any more learner comments you'd like to build (midpoint or final), feel free to drop the observation and supervision level and I'll format them the same way for quick use in evaluations.



I do have another learner comment. This is about the student's communication skills. The student is able to counsel however speaks too fast for most patients to understand. Patient's look confused and the learner does not appear to have self-awareness to adjust or use counseling techniques to ensure patient understanding

⚠️ **Reminder:** Do not include any personally identifiable student information (FERPA) or protected patient health information (HIPAA). Use general descriptions only.

### **Patient Communication / Counseling:**

[Student] demonstrates the ability to provide medication counseling but frequently speaks at a pace that may be difficult for patients to follow, as evidenced by patient confusion during interactions. Developing greater self-awareness of patient cues and incorporating counseling techniques such as pausing, checking for understanding, and using teach-back will help improve clarity and patient engagement. Next step: intentionally slow the delivery of key points and practice confirming patient understanding throughout the conversation.

*Relevant EPA(s): 8*

## Professionalism Example

Thank you, the final comment is regarding professionalism. The student has arrived late twice throughout the first 3 weeks of rotation. We verbally discussed this. The expected start time is 9 am, and the student needs to have patient's worked up prior

⚠️ Reminder: Do not include any personally identifiable student information (FERPA) or protected patient health information (HIPAA). Use general descriptions only.

### **Professionalism / Reliability:**

[Student] has demonstrated engagement during rotation activities; however, they arrived after the expected 9:00 AM start time on two occasions during the first three weeks. Expectations for punctuality and preparing patient workups prior to the start of the day were discussed to support readiness for clinical activities. Next step: consistently arrive on time and allocate sufficient preparation time to ensure patients are fully reviewed before scheduled responsibilities begin.

*General professional behavior area: Professionalism & dependability.*

# Constructive Feedback Tips



FOCUS ON  
BEHAVIORS



USE “I”  
STATEMENTS



PAIR CRITIQUE  
WITH ACTION STEP



REINFORCE  
PROGRESS

Application

# Binghamton University Chatbot

<https://chatgpt.com/g/g-68e953d6338c819188f4e9ac45816154-pharmacy-preceptor-comment-builder>

Student improving but still needs close supervision with care plans.

To ensure the comment aligns appropriately:

1. Is this for a **formative (midpoint)** or **summative (final)** evaluation?
2. What **level of supervision (1-5)** would you be comfortable providing for care plan development at this time?
3. Is this student in an **IPPE** or **APPE** rotation?



Midpoint. The student is starting to craft care plans, but needs improvement with identifying all clinical factors and monitoring parameters. The student is also late occasionally, and dress is not adequate for site. Please determine entrustment levels based on this school's evaluation: [How to apply scoring](#)  
[Entrustment Scale for EPAs](#)

Level of

Entrustment

Description of expected level of entrustment

Interpretation

pertinent clinical factors.

**EPA 2: Assess Information – Level 2 (Direct Supervision)**

The student is beginning to identify medication-related problems but requires guidance to prioritize issues and recognize all contributing clinical variables. Focus on developing a systematic approach to assessment to strengthen independent clinical reasoning.

**EPA 3: Create a Care Plan – Level 2 (Direct Supervision)**

The student is starting to draft care plans and demonstrates progress; however, monitoring parameters and key clinical considerations are sometimes incomplete. Continue refining goal setting and therapeutic monitoring plans to move toward reactive supervision by the end of the rotation.

**EPA 9: Monitor and Evaluate – Level 2 (Direct Supervision)**

The student recognizes the need for follow-up but requires assistance selecting appropriate and patient-specific monitoring parameters. Practice linking therapeutic decisions with clear efficacy and safety monitoring plans.

Add professionalism concerns to the midpoint evaluation below:

ProfessionalismSection Weight: 0%

The SOPPS maintains a professionalism policy that applies to all students. Students who do not comply with the professionalism standards are at risk of immediate failure of the APPE as decided by the preceptor and the OEE. If a student is dismissed from the site by the preceptor for any professionalism reason, the student may fail the APPE.

**Exhibits behaviors and values consistent with the trust given to the profession:**

The student demonstrates respectful interactions with patients and team members and is receptive to feedback. Continued attention to professional presentation and consistency in professional behaviors will help strengthen trust and credibility in the practice setting.

**Practices in an ethical/legal/compassionate manner and maintains confidentiality:**

The student practices in an ethical and compassionate manner and maintains appropriate confidentiality. Continue reinforcing accountability and professional standards in all aspects of practice.

**Punctual, reliable, dependable, and responsible:**

The student has occasionally arrived late, which impacts workflow and team expectations. Consistent punctuality and proactive communication regarding any schedule concerns are necessary to meet professional standards.

**Uses time efficiently and prioritizes effectively:**

The student is developing prioritization skills but benefits from guidance to manage responsibilities efficiently. Continue practicing task planning and time management strategies to support readiness for

increased autonomy.



Copilot

Here's a polished, professional midpoint evaluation comment you can use for a pharmacy student:

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### **Midpoint Evaluation Feedback**

The student is demonstrating steady improvement in clinical reasoning and patient care activities. They are increasingly able to identify relevant drug-related problems and articulate appropriate therapeutic goals. However, continued close supervision is still needed when developing and finalizing care plans. The student would benefit from further practice integrating patient-specific factors, applying evidence-based guidelines, and clearly justifying therapy recommendations. With ongoing guidance and additional opportunities to independently work through care plan development, the student is expected to continue progressing toward competency.

---

If you'd like, I can also tailor the feedback to a specific rotation type (ambulatory care, inpatient, community), add strengths/areas for improvement sections, or format it for an official evaluation form.

# Midpoint Evaluation – Pharmacy Student

## General Summary

At the midpoint of the rotation, the student is beginning to craft care plans and is showing gradual progress in clinical reasoning. However, they continue to require support in identifying all relevant clinical factors and selecting appropriate monitoring parameters. Professionalism concerns have also been noted, including occasional tardiness and attire not meeting site expectations. Continued coaching and closer supervision remain necessary.

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## Entrustable Professional Activities (EPA) Ratings & Comments

Below are recommended **Entrustment Levels** based on the school's scale:

**Midpoint Comment:** The student gathers basic subjective and objective information reliably. They occasionally require prompts to explore deeper patient-specific factors (e.g., adherence barriers, OTC use). With support, they can complete a thorough medication history.

---

## 2. Assess collected information

**Entrustment Level: 2 – Direct Supervision**

**Midpoint Comment:** Still developing competency in identifying medication-related problems. The student sometimes misses key clinical factors such as contraindications, renal/hepatic considerations, or therapeutic duplications. Requires direct supervision to ensure accuracy.

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## 3. Create a care plan

**Entrustment Level: 2 – Direct Supervision**

#### **4. Contribute medication-related expertise as part of an interprofessional team**

**Entrustment Level: 2 – Direct Supervision**

**Midpoint Comment:** The student can discuss patient cases with the preceptor but is not yet ready to independently provide recommendations to other professionals. Needs support building confidence, using evidence, and presenting concise recommendations.

---

#### **5. Answer medication-related questions using scientific literature**

**Entrustment Level: 3 – Reactive Supervision**

**Midpoint Comment:** The student demonstrates the ability to search primary/secondary literature and provide basic responses. Needs guidance to critically evaluate study quality and apply findings to specific patients.

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## 6c. Clinical reasoning – medication regimen adjustments

**Entrustment Level: 2 – Direct Supervision**

**Midpoint Comment:** The student requires assistance identifying when therapy modifications are needed and selecting appropriate monitoring parameters. Not yet ready to independently justify therapy changes.

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## 7. Fulfill a medication order

**Entrustment Level: 3 – Reactive Supervision**

**Midpoint Comment:** The student performs well with basic dispensing and verification tasks under indirect oversight. Occasionally requires clarification on dosing, calculations, or safety checks.

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## 9. Monitor and evaluate the safety and effectiveness of a care plan

**Entrustment Level: 2 – Direct Supervision**

**Midpoint Comment:** The student is improving but often misses appropriate follow-up intervals, therapeutic goals, or adverse effect monitoring. Continued supervision needed to strengthen clinical judgment.

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## 10. Report adverse drug events and medication errors

**Entrustment Level: 3 – Reactive Supervision**

**Midpoint Comment:** With guidance, the student can identify and document errors appropriately. Needs more practice recognizing system contributors and suggesting preventive strategies.

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## 11. Deliver medication or health-related education to professionals/the public

## 12. Identify populations at risk for disease or adverse outcomes

**Entrustment Level:** 3 – Reactive Supervision

**Midpoint Comment:** The student can recognize risk factors when prompted and complete screenings with oversight. Needs additional repetition to independently identify at-risk populations.

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## 13. Perform technical, administrative, and supporting operations

**Entrustment Level:** 3 – Reactive Supervision

**Midpoint Comment:** The student performs routine tasks adequately and follows workflow with minimal prompting. Occasional assistance is required for prioritization, efficiency, or policy nuances.

- Improvement is needed to meet professionalism expectations and maintain reliability within the clinic team.

## Dress Code

- The student's attire has, at times, **not met site standards**.
- Professional dress should be addressed immediately to maintain patient trust and represent the pharmacy profession appropriately.

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If you'd like, I can also:

- ✓ create a "final evaluation version"
- ✓ rewrite comments in a shorter or more formal tone
- ✓ tailor the EPA ratings to a specific rotation (inpatient, ambulatory, community)

# Midpoint Professionalism Evaluation Comments

## 1. Exhibits behaviors and values consistent with trust given to the profession

### Midpoint Comment:

The student generally interacts appropriately with patients and staff and demonstrates respect for the professional role. At times, lapses in professional appearance have occurred, with attire not meeting site expectations. Continued improvement in consistently meeting professional standards is needed to maintain patient and team trust.

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## 2. Practices in an ethical/legal/compassionate manner and maintains confidentiality

meet professional expectations and ensure reliability within the healthcare team. The student is encouraged to plan proactively to ensure on-time arrival moving forward.

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#### **4. Uses time efficiently and prioritizes effectively**

**Midpoint Comment:**

The student is developing time-management skills and is able to complete most assigned tasks with guidance. Additional practice is needed in prioritizing clinical responsibilities and managing workflow efficiently, especially as patient care expectations increase.

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#### **5. Cooperative, respectful, diplomatic, and confident**

**Midpoint Comment:**

The student demonstrates a positive attitude and effective communication with the staff. Confidently

# Encouraging Learner Reflection



Leverage open ended questions



“What went well?”



“What would you change?”



“What support do you need?”

# Question

Which of the following characteristics is considered a hallmark of effective learner feedback?

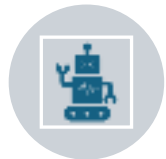
- A. General praise without specific examples
- B. Delayed feedback provided at the end of training
- C. Specific, timely, and actionable comments
- D. Feedback focused only on learner weaknesses



# Take Aways



High-quality feedback is essential for learner growth  
AI should support, not replace, educator judgement



AI tools can improve efficiency and consistency  
Ethical use requires privacy, oversight, and verification



Effective prompts are specific and competency-aligned

# Questions?

Thank you!

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