

The Missing Layer

How Conversational AI Turns Student Reflection Into Institutional Intelligence

STARTING PROMPT

REFLECTION PROMPT GIVEN TO ALL STUDENTS

"Welcome! Please take a moment to reflect on your experiences in ECEG 205 this semester. What stands out to you? You might include something you learned, a connection to another course or interest, a challenge you faced, or a way you have grown."

TWO REFLECTIONS, ONE PROMPT

TRADITIONAL REFLECTION

Student A

I would say the main thing that stood out to me during this course was the line-following robot project. It helped me think about topics learned in class and apply them to real scenarios.

I also happened to enjoy the project a lot as I believe it was structured nicely and did not require a lot of work outside of lab time. The class itself was also pretty straight forward. I do not feel like there were ever really trick questions or in any case did I feel like I was in a position where I was at a loss.

AI ENHANCED REFLECTION

Student B

Some of the most interesting things that I have learned this semester include MOSFETs and motors. While these may have been a bit more challenging to learn, I do feel that they are quite applicable to the real world. These topics in particular stood out to me as I learned that they are used in everyday applications like components in cars or toys, to components in aerospace engineering applications.

In the future, I could see myself using MOSFETs and motors in various electrical mechanical applications. Motors in particular as they are used in most circuits when you want an output to be moving something, which is extremely relevant to mechanical engineering. For me, this may include applications in medical devices or with farm equipment.

While learning about these topics in this class has not necessarily changed my future career goals, it has given me much more confidence

in my skills and knowledge regarding electrical components and circuits, including how I could potentially apply them in the future.

Just more recently, when we were learning about filters and complex numbers and logarithmic scales and Bode plots, I feel that I was really challenged with trying to understand how everything is applied in any scenario we are given. Being able to work through these challenges in my learning, I feel genuinely gave me a better understanding of the material.

I do believe that failure and mistakes are some of the greatest ways to learn, as you will most likely retain the information better than if you were merely just lectured on the topic. In this class specifically, the challenges I had to overcome really helped me with facing challenges with this class in the future.

THE VISIBLE DIFFERENCE. Same prompt, same course, same week. The AI enhanced reflection draws out depth, transfer, and metacognition that traditional one-shot prompts rarely surface.

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IRB APPROVAL

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A Conversation Worth Having

A complete five-turn AI guided reflection, with the TORI dimensions surfaced in real time.

In an AI enhanced reflection, the system listens for evidence of growth, identifies relevant TORI categories, and asks one purposeful follow-up question at a time. Students remain in control. The AI never grades or judges. It simply makes the next layer of thinking visible.

STUDENT C

Coming into ECEG 205, I had very little knowledge on Arduinos and programming as well as anything to do with voltages and resistors. At the start, circuits and programming were very difficult for me, however as the semester progressed I became more aware and understanding of these concepts. As it turns out, my favorite part of this course was the actual Arduino work because I found that to be pretty cool and interesting.

AI REFLECTION GUIDE

It sounds like you have experienced real growth in both your confidence and skills with Arduino and circuit concepts. Way to push through those early challenges. Looking back, was there a specific lab, project, or moment when things started to “click” for you, helping you connect theory to hands-on practice?

TORI: *Personal Growth • Growing from Failure • Learning Styles • Curiosity & Inquiry • Narrative Construction*

STUDENT C

Things really began to start clicking in lab 5 with the temperature sensors. I was able to understand at least the basics of where the wires and resistors should go. However, I got a much deeper understanding through the Line Following Robot project. I feel like through all the trial and error, I was really able to cement much of the concepts in both the coding and circuit building aspects.

AI REFLECTION GUIDE

It is great to hear how hands-on experiences like Lab 5 and the Line Following Robot project helped you turn initial confusion into deeper understanding. That kind of trial and error is a powerful learning tool. As you reflect on those moments of frustration and eventual success, how did your approach to problem solving or tackling challenges shift during the process?

TORI: *Creative Problem-Solving • Resilience & Failure Adaptation • Mindful Awareness & Action • Narrative Construction • Problem-Solving*

STUDENT C

At the beginning, my approach to challenges that arose during this course was to look at the big picture and try to solve it all at once. While it might have worked at the start when we were working with less complicated circuits, towards the end of the semester that did not really fly. I found it to be way more beneficial to break things up into much smaller, more manageable steps in order to find out where exactly I went wrong. This also helped my understanding of each and every part of the process.

AI REFLECTION GUIDE

That is an awesome shift. You have moved from big picture troubleshooting to a step by step approach, which not only makes complex problems less overwhelming but also deepens your grasp of each component. As you think about this new problem solving strategy, how might you apply what you have learned about breaking down challenges to future courses or situations outside the classroom?

TORI: *Cognitive Flexibility • Problem-Solving • Behavioral Patterns • Personal Growth • Adaptive Learning*

STUDENT C

I feel like I can apply this strategy to almost all of my courses and potential employment in the future. By iterating problems into smaller sections, I feel like I will learn the material I am studying on a much better level. Doing it this way helps form patterns and processes that I can use to solve the problems in a way that makes sense to me and helps me tackle the complex and difficult challenges that arise. Instead of starting at the big picture, if I start small I will be way less likely to become overwhelmed and will have a much greater chance of success.

AI REFLECTION GUIDE

It is fantastic that you see the value of breaking problems into manageable parts not just for school, but for your future career and lifelong learning. Recognizing your need for clarity and approachable steps is a powerful skill. Thinking ahead, how do you envision using these new patterns and processes to foster growth or support others who might be facing steep learning curves like you did?

TORI: *Future Planning • Pattern Recognition • Personal Growth • Empowerment • Peer Mentoring Reflection*

STUDENT C

In terms of growth, I believe that there can not be substantial growth without a strong foundation. By solving problems in this manner, you develop a strong sense of the basics, as you have to keep practicing them, and that leads to amazing growth. In terms of support, if I have a strong understanding of how to solve these difficult problems through the patterns and processes I develop, I can support others by seeing exactly where they went wrong.

AI REFLECTION GUIDE

You have highlighted how building a strong foundation through repeated practice leads to meaningful growth, and your willingness to help others by sharing your process is really empowering. What steps do you think you can take next semester to continue developing both your own mastery and your ability to mentor or collaborate with others?

TORI: *Goals & Motivation • Learning from Others • Peer Mentoring Reflection • Self-Efficacy • Future Planning*

STUDENT C

I'm done for now.

From Reflection to Intelligence

The summary returned to the student, plus the TORI dimensions surfaced across the dialogue.

AI SUMMARY RETURNED TO STUDENT C

Here is a summary of your thoughtful reflection

- You shared how starting with little knowledge, especially in programming and circuits, led to significant personal growth as you persisted through hands-on challenges.
- You described key turning points, like Lab 5 and the Line Following Robot project, where hands-on trial and error helped you “cement” your understanding.
- You identified a shift from trying to solve large problems at once to breaking them into smaller, manageable steps, which deepened your learning and confidence.
- You explored how this new strategy applies widely, to future coursework, professional growth, and supporting peers.

TORI CONNECTIONS SURFACED

01 Personal Growth

You framed your journey as a story of transformation, echoing Dewey’s experiential learning and Vygotsky’s scaffolding ideas.

02 Growing from Failure

Trial and error and learning from setbacks played a central role.

03 Creative Problem-Solving

You developed strategies to approach more complex challenges.

04 Pattern Recognition

You noted how breaking tasks down helps spot underlying patterns and build a strong foundational understanding.

05 Behavioral Patterns

Reflection on how your approaches shifted over time.

06 Future Planning

Looking forward to applying these strategies elsewhere.

07 Peer Mentoring Reflection

Interest in helping others using what you have learned.

08 Cognitive Flexibility

Adapting methods to fit the complexity of each challenge.

09 Adaptive Learning

Evolving your study and problem solving techniques.

10 Empowerment

Gaining confidence and skills to approach new challenges and support others.

CLOSING REFLECTION FROM THE AI TO STUDENT C

You demonstrated clear, insightful metacognition by connecting your evolving strategies to course experiences and future plans. Well done.

THE INSTITUTIONAL LAYER

When thousands of these reflections are aggregated and de-identified, the same TORI dimensions become a longitudinal map of student development across courses, programs, and cohorts. That is the missing layer. The bridge between an individual student's growth and the institution's capacity to see it, support it, and scale it.

CONTINUE THE CONVERSATION

AAC&U WEBINAR PAGE

Session details

www.aacu.org/webinars/the-missing-layer

DIGICATION EVENT PAGE

Additional resources

www.digication.com/events/aacu-missing-layer-webinar

SESSION

2026 AAC&U Webinar
May 6, 2026

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