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Teaching with and for Metacognition in Disciplinary Discussions

Susan O'Hara, Robert Pritchard and Debi Pitta

Abstract

Teaching metacognitively, which involves teaching *with* metacognition and teaching *for* metacognition, is critical for learners of any age. *With* enables teachers to gain awareness about and control over how they think and teach, and to monitor, evaluate, and adjust their instructional practices in accordance with specific students, goals and contexts. *For* enables teachers to design instruction that will develop and activate their students' metacognition, enabling them to be aware of what they know and do not know, and take action to address flaws or gaps in what they know. Our research findings, based on empirical studies conducted in a variety of educational settings, have identified effective instructional practices for teaching metacognitively. This chapter focuses on practices that support the metacognition of learners engaged in disciplinary discussions. This emphasis addresses a significant void in the research literature which more commonly targets metacognition in learning generally or applied specifically to reading and writing.

Keywords: teaching with metacognition, teaching for metacognition, teaching frame, disciplinary discussions, instructional practices

1. Introduction

Teaching metacognitively, which involves teaching with metacognition and teaching for metacognition, is critical for learners of any age. Teaching with metacognition enables teachers to gain awareness about and control over how they think and teach by planning, monitoring, evaluating, and adjusting their instructional goals and teaching strategies in accordance with their students' needs and the socio-cultural context. Teaching for metacognition enables teachers to design instruction that will develop and activate their students' metacognition, enabling students to be aware of what they know and do not know by engaging in reflective processes, and to take action to address flaws or gaps in what they know by employing self-regulation strategies.

Given the essential role that teaching metacognitively plays in the professional growth of teachers and the academic development of students, a need exists for a tool to support teaching with and for metacognition. Our research findings, based on empirical studies conducted in a variety of educational settings [1–4], have identified such a tool: The SOAR Teaching Frames for Literacy. This chapter focuses on the SOAR Teaching Frame for Disciplinary Discussions and instructional practices

that support the metacognition of learners engaged in academic conversations, e.g., face-to-face interactions, online dialogues, and written conversations. This emphasis addresses a significant void in the research literature which more commonly targets metacognition in learning generally or applied specifically to reading and writing.

2. What is SOAR?

SOAR, which stands for strategic observation and reflection, is not a curriculum or a set of instructional strategies. SOAR is the lens teachers look through as they plan, teach, reflect upon, and elevate their teaching practice by engaging in cycles of strategic observation and reflection. SOAR has emerged from more than a decade of systematic research and development designed to identify the essential practices that teachers can use to drive learning across disciplines. More specifically, we identified research-based essential practices for disciplinary discussions through analyses of data from Delphi panel studies of expert consensus on disciplinary literacy instruction across content areas [4–7], video observations of classroom instruction [1], existing instructional practice protocols with established reliability and predictive validity [2, 8–10], and an extensive review of the research literature on effective language and literacy instruction [11–15]. One High-Impact Practice emerged as having significant potential to enhance students' ability to engage in student-to-student academic discourse. We call this practice disciplinary discussions.

Our research also suggests that this essential High-Impact Practice does not operate in isolation. Instead, effective teachers enact a set of dynamic instructional moves during instruction in support of the High-Impact Practice. We labeled this set of three instructional moves Cross-Cutting Practices.

Facilitating acquisition of academic language: this practice focuses on structuring, strengthening, and supporting the acquisition and use of the academic language needed to participate in disciplinary discussions [13, 16–18].

Fostering metacognition for disciplinary learning: this practice focuses on the degree to which a teacher visibly enacts and deconstructs metacognitive processes and strategies that foster students' metacognitive knowledge and their ability to engage in academic discourse [19, 20].

Monitoring and guiding disciplinary learning: this practice focuses on how effectively a teacher monitors and guides disciplinary learning as well as adjusts and supports disciplinary discussions to meet the current needs of all students in the classroom [21, 22].

Finally, in preparation for enactment of High-Impact and Cross-Cutting Practices, teachers employ a Foundational Practice.

Designing instruction for disciplinary thinking and understanding: this practice focuses on the design of lessons and learning tasks to promote disciplinary discussions and support the High-Impact Practice. This practice also focuses on how the teacher establishes high expectations and fosters in all students the willingness to participate in intellectually rigorous tasks that require academic discourse [21, 23–26].

To illustrate the interconnectedness of the practices, we organized them into a Teaching Frame consisting of the High-Impact Practice supported by the Cross-Cutting and Foundational Practices (see **Figure 1**). The frame is designed to help instructors understand and implement the High-Impact Practice that drives student learning, while simultaneously enacting a set of dynamic instructional moves in support of the High-Impact Practice and taking the foundational planning steps needed to do this well. This Teaching Frame provides a common language around

Disciplinary Discussions

HIGH-IMPACT PRACTICE	• Build disciplinary conversation skills • Provide extended and supported opportunities for students to engage in disciplinary discussions		
CROSS-CUTTING PRACTICES	Facilitating Acquisition of Academic Language • Introduce and/or refer to the academic language demands of texts and tasks • Provide extended and supported opportunities for students to acquire and use the features of academic language	Fostering Metacognition for Disciplinary Learning • Visibly enact metacognitive processes and/or strategies students are expected to use in support of disciplinary learning • Deconstruct metacognitive processes and/or strategies that support disciplinary learning	Monitoring and Guiding Disciplinary Learning • Monitor learning and adjust instruction, supports, and disciplinary tasks to meet student needs • Provide written and/or oral feedback during lessons to promote disciplinary learning
FOUNDATIONAL PRACTICE	Designing Instruction for Disciplinary Thinking and Understanding • Set disciplinary learning targets that are aligned with ELA/Literacy CCSS and the target high-impact practice • Structure and connect tasks that support the learning targets • Establish high expectations that support the learning targets and maintain the intellectual rigor of classroom activities and tasks		

Figure 1.
SOAR teaching frame.

instruction at a grain size that allows instructors from kindergarten to higher education to meaningfully plan and reflect individually or collaboratively.

3. Using SOAR to teach with metacognition

By using a SOAR Teaching Frame—in this case, the SOAR Teaching Frame for Disciplinary Discussions—as a lens to plan, teach, and reflect upon their instructional practice, teachers are by definition teaching with metacognition. That is, they are gaining awareness about and control over how they think and teach by using the High-Impact, Cross-Cutting, and Foundational Practices to plan, monitor, evaluate, and adjust their instructional goals and teaching strategies. To support teachers through this process we have developed an implementation rubric that is aligned with each practice in the disciplinary discussions teaching frame. **Table 1** contains the section of the rubric that is aligned with the High-Impact Practice.

Moving along the rubric from “no implementation” to “full implementation” enables a teacher in the planning stage to focus specifically on what she needs to include in her lesson. For instance, if her students are still developing the conversation skills necessary to engage in disciplinary discussions (Element 1), the implementation rubric will help the teacher recognize the need to introduce and refer to those skills as well as provide support for students to use them in tasks and activities. Then, when the lesson is over and the teacher is reflecting on how successful it was, the rubric can help her recognize what worked and what did not work. For instance, she may realize that the supports she used enabled some students to use the conversation skills to engage in a discussion, but other students clearly needed something more. This insight will help the teacher adjust her instruction during the next lesson.

We are currently using the SOAR Teaching Frames in professional learning programs for teachers, coaches, and instructional leaders in partner schools and school districts across the United States. We have also brought the SOAR model and

	No implementation			Full implementation
ELEMENT 1: Build disciplinary conversation skills	Teacher does not introduce or refer to disciplinary conversation skills.	Teacher introduces and/or refers to disciplinary conversation skills, but does not provide support for students to use them during tasks and activities.	Teacher introduces and/or refers to disciplinary conversation skills and provides support to enable most students to use them during tasks and activities.	Teacher introduces and/or refers to disciplinary conversation skills and provides support to enable all students to use them during tasks and activities with diverse partners.
ELEMENT 2: Provide extended and supported opportunities for students to engage in disciplinary discussions	Teacher does not provide opportunities for disciplinary discussions.	Teacher provides limited and/or unsupported opportunities for students to engage in disciplinary discussions. Routines for disciplinary discussions are not evident, or students are not required to use them during tasks and activities.	Teacher provides supported opportunities for students to participate in disciplinary discussions. Routines for disciplinary discussions are evident, and teacher provides support to enable most students to use them during tasks and activities.	Teacher provides extended and supported opportunities for students to participate in disciplinary discussions. Routines for disciplinary discussions are evident, and teacher provides support to enable all students to use them during tasks and activities.

Table 1.
Implementation rubric: disciplinary discussions.

materials to Teacher Preparation Programs and New Teacher Induction Programs. Based on these experiences we have identified stages of awareness and action that instructors typically go through when using SOAR to teach with metacognition (see **Figure 2**).

The first stage represents someone who is not familiar with SOAR and therefore is unable to use it as a lens to plan, teach, and reflect. The second stage depicts someone who has been introduced to SOAR but who is still learning how to use a teaching frame and the instructional practices that support the metacognition of learners engaged in disciplinary discussions. Teachers at this stage of the continuum tend to equate SOAR with the use of certain instructional strategies (e.g., Layering Text, What Makes You Say That?) rather than a specific High-Impact, Cross-Cutting or Foundational Practice. Teachers at the third stage of the continuum have developed a deeper understanding of SOAR as evidenced by their ability to use a High-Impact, Cross-Cutting or Foundational Practice as a lens to plan, teach and reflect, but because their focus is at the practice level, the metacognitive impact of the planning-reflecting process is limited. Finally, teachers at the last stage have developed an understanding of how all of the practices of the SOAR Teaching Framework work together and can be used as a lens to plan, monitor, evaluate, and adjust their instructional goals and teaching strategies in accordance with their students’ needs and the sociocultural context. Using SOAR in this way to teach with metacognition has the greatest impact on the academic development of students.

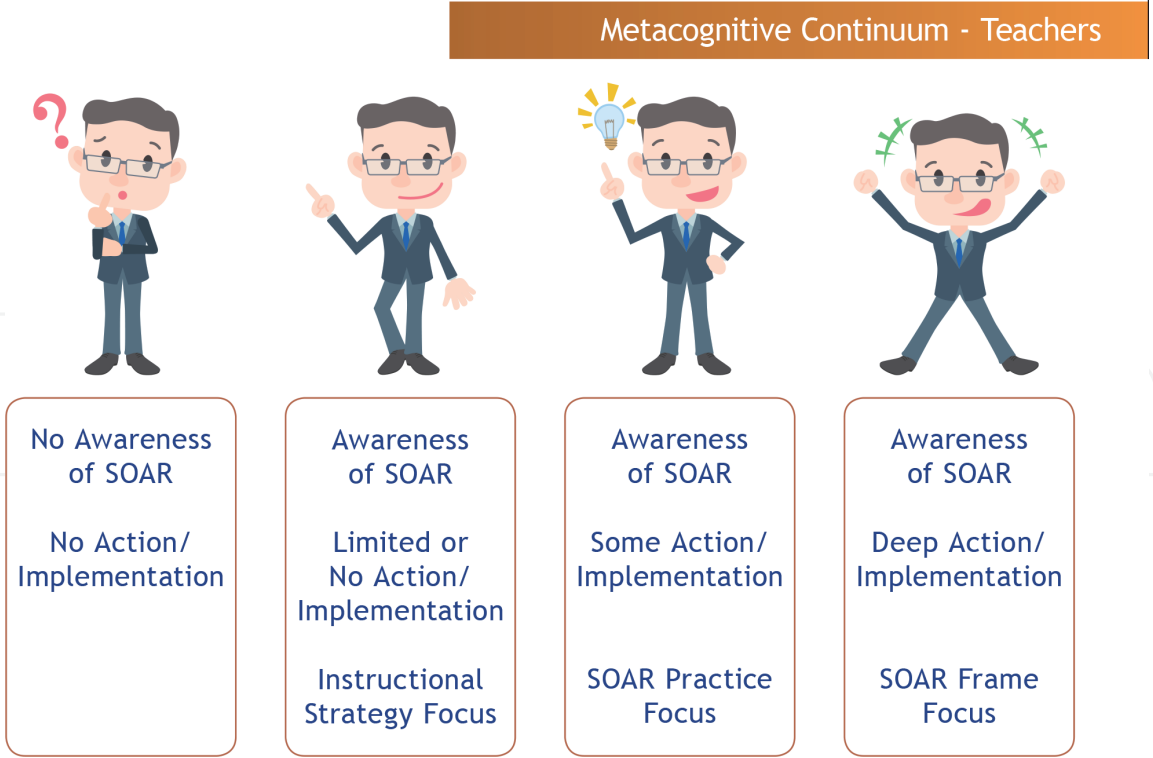


Figure 2.
Metacognitive continuum—teachers.

4. Using SOAR to teach for metacognition

Our research and professional development experiences over the past decade have convinced us that many teachers struggle to acquire and apply the conceptual understanding and skills necessary to develop students’ metacognitive knowledge; in other words, the ability to teach for metacognition. One reason for this is that reflecting on and improving performance on a task is easier when the task requires physical action, e.g., hitting a golf ball. You can watch a video of yourself engaged in this task or listen to feedback from a coach who observed you. Cognitive tasks, on the other hand, are invisible and cannot be directly observed, making it harder for students to reflect on their performance and take action to correct it when necessary. So, the instructional challenge most teachers face is how to help students improve their performance on tasks that are dependent upon invisible cognitive progresses. Our research indicates that SOAR can support teachers in this endeavor [3, 27].

As we explained in the preceding section, the Disciplinary Discussions Teaching Frame as a whole—High-Impact, Cross-Cutting, and Foundational Practices—provides the lens that enables instructors to teach with metacognition. Using SOAR to teach for metacognition requires a narrower focus: the Cross-Cutting Practice of Fostering Metacognition for Disciplinary Learning. This practice’s emphasis on visibly enacting and deconstructing metacognitive processes and strategies enables teachers to design instruction that will develop and activate their students’ metacognition. Students will become aware of what they know and do not know by engaging in reflective processes, and they will be able to take action to address flaws or gaps in what they know by employing self-regulation strategies.

Consistently engaging students in reflective processes and explicitly teaching metacognitive strategies are at the heart of teaching for metacognition. But as is the case with any learning, not all students progress at the same pace. We have identified stages of awareness and action that learners typically go through as they develop their metacognitive abilities (see **Figure 3**).

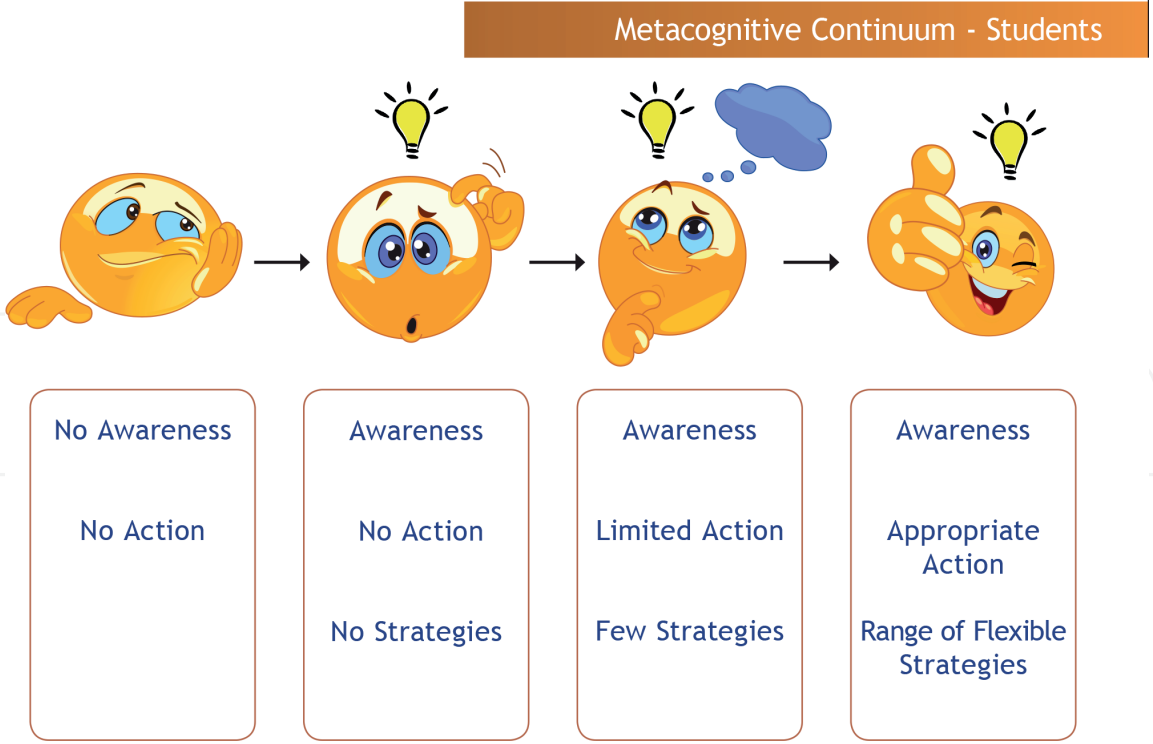


Figure 3.
Metacognitive continuum—students.

The first stage represents a student who does not reflect on his learning and is therefore unaware of how well or poorly he is doing on the assigned task. And because awareness triggers action, he cannot take action to correct any problems that may arise. For instance, think of a student who does not recognize, and therefore mispronounces, many words as he attempts to read a story aloud. But because he does not realize he is mispronouncing them he does not stop to correct himself. This student was unaware that he was not reading the words correctly, so he did not/could not take any action, i.e., use reading strategies to address the problem.

The second stage depicts a student who is reflective, that is, he is aware that he is experiencing problems with an assigned task. However, this student is unable to take any action to address the problem because he has not been taught strategies to use in this situation. Imagine a reader who, unlike one at the first stage of the continuum, is aware that he does not recognize the words he is reading. However, this reader is unable to take action because he has not been taught reading strategies to use when this occurs, e.g., use phonics to sound out unknown words.

Students at the third stage of the continuum have developed a deeper understanding of metacognition as evidenced by their ability to use strategies when problems arise. The challenge these students experience is that they have a limited range of strategies to use, so they struggle if the one or two strategies that they have ownership of do not prove to be successful. For instance, a reader at the third stage realizes that he has trouble recognizing and pronouncing certain words, but he has only been taught (or has only learned) to use phonics to sound out unknown words and, when that does not work, he asks the teacher for help. Students at this stage are certainly progressing metacognitively, but they are not yet at the level where they can apply a range of strategies flexibly and independently.

Finally, students at the last stage have become aware of what they know and do not know by engaging in reflective processes, and they are able to take action to address flaws or gaps in what they know by employing a variety of self-regulation strategies flexibly and independently. A reader at this stage, who encounters words he does not recognize and is unable to pronounce, is able to try a range of strategies.

For instance, he is confident of his ability to use phonics to sound out words, but he knows that is not the best strategy to use with polysyllabic words. So, when he encounters “photosynthesis” he breaks the word into parts using the morphological skills his reading teacher taught him.

5. Teaching for metacognition in disciplinary discussions

Through our research and work with educators in schools we have identified key stages that represent what teachers need to do when teaching for metacognition in disciplinary discussions. These five stages begin with helping students understand what metacognition is and progress through student reflection on their thinking, understanding metacognitive strategies, and then applying them independently. **Figure 4** outlines these five stages. Below we provide an explanation of each stage, a scenario to illustrate what this might look like in instruction, and some strategies teachers can use to implement these ideas in their teaching.

5.1 Introducing metacognition

Teaching for metacognition in disciplinary discussions must begin with an explicit explanation of what we mean by metacognition. In our experience “thinking about thinking” is too abstract and vague a definition to resonate with most students. Our work with instructors and learners across the grade level spectrum has led us to this: metacognition is awareness of what you know and do not know, and the action you take to address flaws or gaps in what you know. The following scenario demonstrates how a teacher who has worked with us introduces the concept to his students and provides a model that others can adapt for their settings.

Scenario for introducing metacognition: Mr. Carter is introducing metacognition to his young students. He says, “I have a really big word I want us to know and understand. It is metacognition. Say it with me, friends. Metacognition. Has anyone ever heard that word before? A few of you. I am going to write it on the whiteboard. Let’s clap it out. Met-a-cog-ni-tion. Excellent. It has five syllables.

One part of metacognition is being aware of what you know and what you don’t know. An example would be us learning our high frequency words. We each have our stack of words. When we can read them automatically, we move them out of our stack. We know that we know those words. The words that are left in our stack are the words we don’t know well. So, I am aware of which words I know and which words I don’t know. That is one part of metacognition. I am going to draw a lightbulb here to represent us being aware of what we know and don’t know.

The other part of metacognition is knowing what action to take to learn what you don’t know. Let’s think about the high frequency words we still need to learn. What can we do to learn them? What action can we take? Talk to a neighbor and see what ideas you can come up with.” Students share out some ideas like practicing more and looking for the words when they read. “Very good. Those are all actions you can take. I am going to draw the brain driving a car to represent the action we are taking to learn what we don’t know.

So, metacognition is being aware of what you know and don’t know and then taking action to learn. This anchor chart (see **Figure 5**) will help us as we continue to work on our metacognition. Turn to your neighbor and explain what metacognition is.”

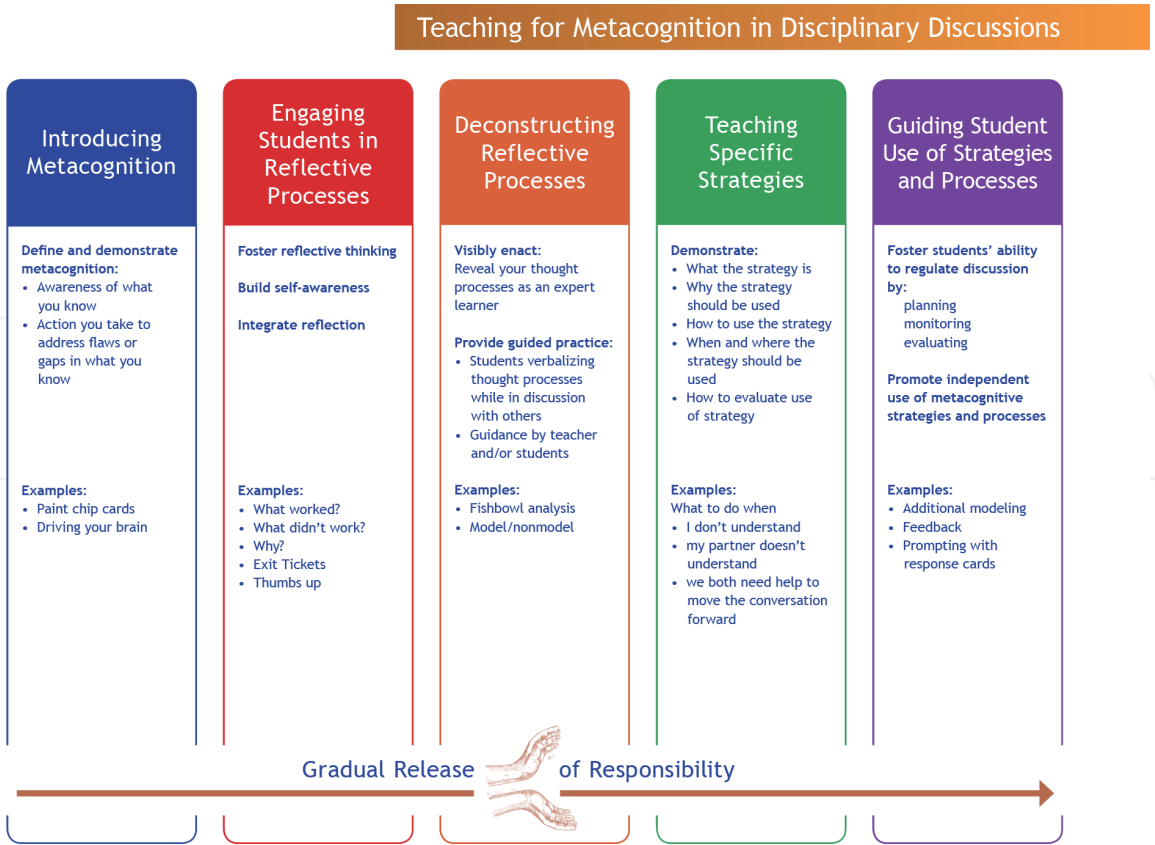


Figure 4. Stages in teaching for metacognition.

In addition to an anchor chart a teacher can demonstrate metacognition using paint chip cards with different gradations. (See Figure 6.) The lighter colors would represent little or no understanding or knowledge while the darker colors would represent stronger understanding or knowledge. Once students are aware of their level of understanding or knowledge, they take action to “drive their brain” to gain more. This visual can also be used for older students.

5.2 Engaging students in reflective processes

Engaging students in reflective processes is the next step in developing students’ metacognitive knowledge of how they learn—their knowledge of themselves as learners, of strategies, and of tasks. It builds the **awareness** aspect of metacognition without which there can be no strategic **action**. Asking questions such as “What worked in your discussion?,” “Did you deepen your understanding of the topic?,” and “What could you do differently in your next discussion?” fosters reflective thinking and helps build self-awareness. When teachers consistently and systematically integrate reflection into their teaching, it permeates the curriculum and gets built into their daily teaching activities. The teacher in the following scenario has done this successfully with her class.

Scenario of engaging students in reflective processes: Ms. Peck has already introduced her students to metacognition. She is now working on having them be more reflective about their discussions in order to improve upon them. Students have just completed a discussion with their partners. She distributes a reflection sheet that has these prompts: What worked? What didn’t work? And why?

“You are all getting so much better in your discussions. Today I want us to think more deeply about our discussions and how each of you did. The first prompt is ‘What worked?’ Think about what worked in your discussion with your partner. Some things to consider might be: Did you both take turns? Did you both share your ideas? Did you ask each other clarifying questions?

The next prompts ask, ‘What didn’t work?’ and ‘Why?’ Think about your discussion. Did it stall? Did you stay on topic? Did you fortify your discussion? Did you help each other get better? So, with your partner, discuss each of these prompts to reflect on how your discussion went.”

At this stage in teaching for metacognition, there are more strategies to help students become engaged in self-awareness. One strategy is a metacognitive “Do Now” which is given to students at the beginning of class. It is a list of actions related to the task they will be doing (in this case engaging in a discussion), and students mark which ones they will attempt to improve upon during their discussion. (See **Figure 7.**) At the end of the lesson, students return to their Do Now and reflect on how they improved in those areas.

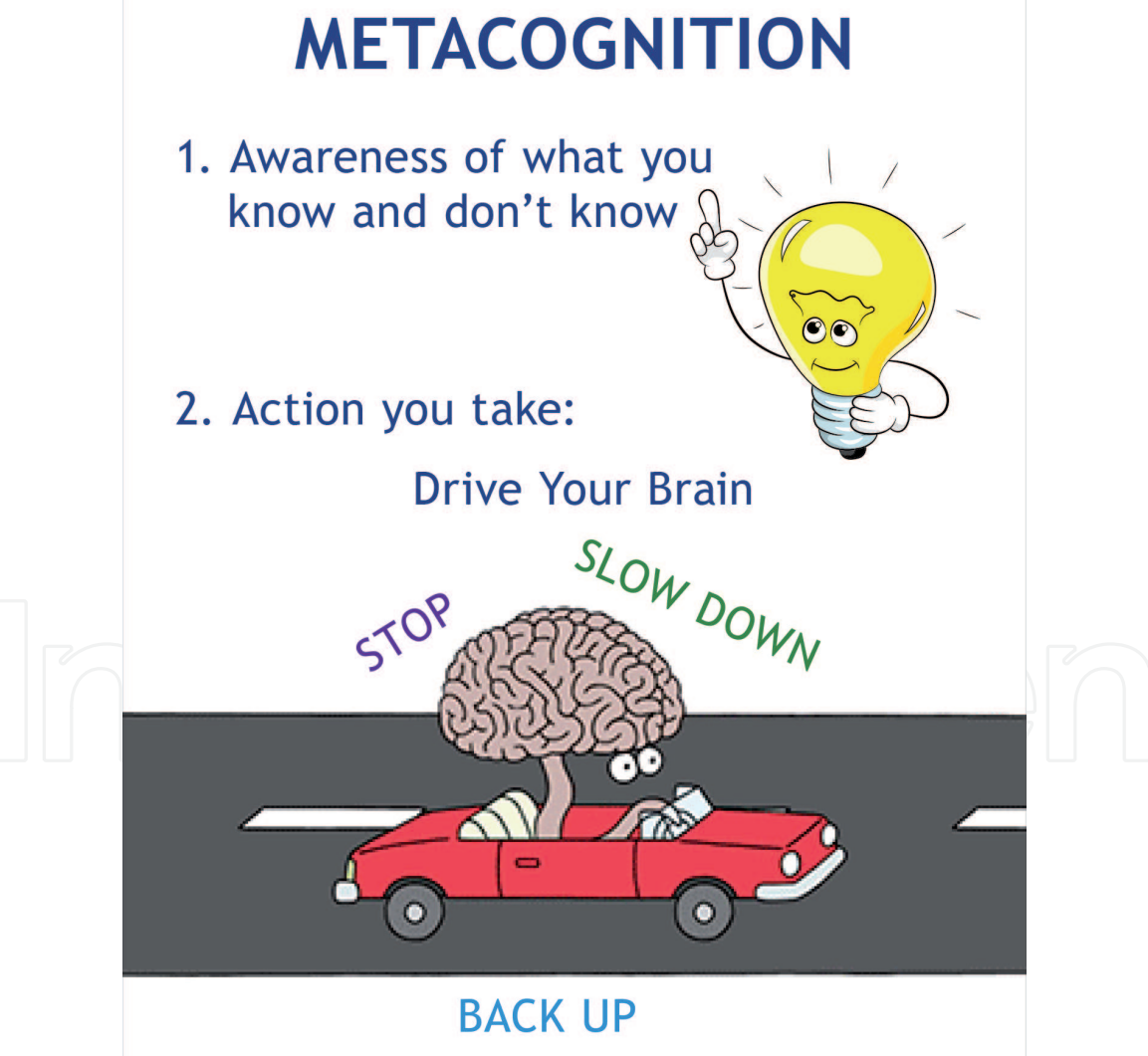


Figure 5.
Metacognition anchor chart.

A strategy that moves students to a deeper level of reflection is a strategy checklist. (See **Figure 8.**) The first column is a list of discussion strategies followed by an additional 3–5 columns that students check to indicate if they used each strategy at

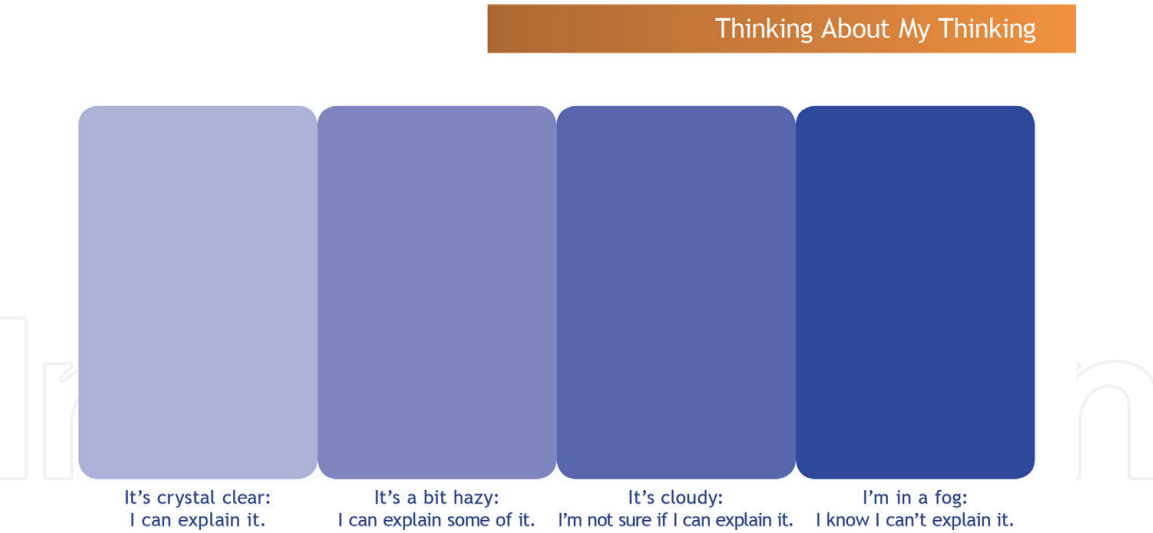


Figure 6.
Paint chip cards.

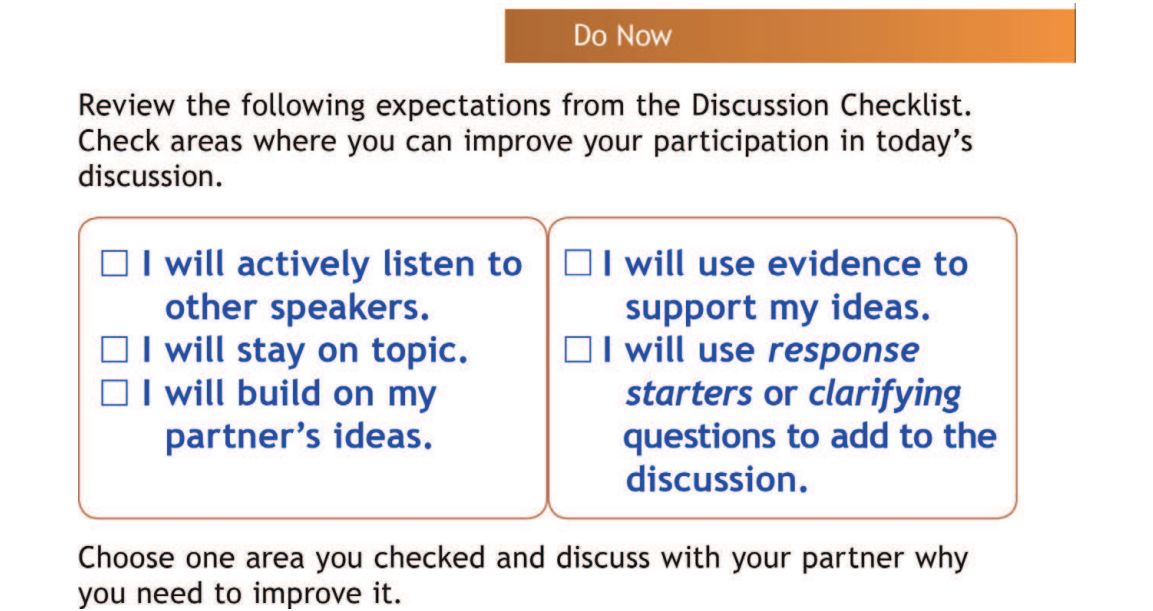


Figure 7.
Do now.

different points in the lesson. A different checklist could ask students to indicate whether “I did it well,” “I need to work on this skill,” or “I need help in using this strategy.” Students complete this checklist at the end of the discussion.

5.3 Deconstructing reflective processes

Modeling your own thinking, i.e., revealing the thought processes of an expert learner, is an essential element of effective teaching because it helps students develop their own metacognitive abilities. However, not everything teachers label as modeling is consistent with this stage in teaching for metacognition. For instance, using a think aloud to verbalize the procedural steps of a learning task is not the same as visibly enacting and deconstructing the underlying thought processes required to complete the task. It is the latter that provides learners with the scaffolded support they need to develop their metacognitive abilities and ultimately become more independently learners. The scenario that follows illustrates how a

Discussion Strategy Checklist					
When I didn't understand ... this is what I did.	1 st Time	2 nd Time	3 rd Time	4 th Time	5 th Time
Raised my hand					
Waited for teacher to call on me					
Told the teacher I didn't understand					
Asked a question to help me understand					
Stopped trying to understand					
Disrupted the lesson					
Other					

Figure 8.
Discussion strategy checklist.

teacher can help students verbalize their thought processes while engaged in discussion with others.

Scenario for deconstructing reflective processes: Mr. Vu is working with his students on strengthening their reflective processes regarding discussions. “Turn to your partner and explain how our self-reflection has strengthened your discussions.” Students then share out how it has helped them be aware of what they are doing well and the gaps that they need to strengthen. “Today, I want to demonstrate some things you can do to continue to strengthen your discussion and co-construct your knowledge with your partner. I am going to be partner A and all of you are going to be partner B. (See **Figure 9**.) We are going to discuss our article: ‘Species at Risk.’ The prompt is ‘Discuss the reasons the Monarch butterfly has decreased its population. I’ll start.’”

Teacher: “One reason that the monarch butterfly population is dropping is due to climate change. Now what can you, partner B, say to me. Joaquin?”

Class (represented by Joaquin): “I could say another reason is pesticides.”

Teacher: “That is a correct. You could state another reason. Is there something else partner B could say? Yes, Isabelle.”

Class (represented by Isabelle): “I could ask you to elaborate.”

Teacher: “Yes, we can discuss climate change more, so we make sure we both understand it before we move on to the next reason. This helps deepens our discussion. So, I will respond to Isabelle. ‘I think that weather is always changing. We are having bigger storms and hotter temperatures. The monarch butterfly migrates from Mexico to the upper United States, over 3000 miles.’ Now, do you think I should ask you, partner B, a question? ... Yes, now I can say ‘What was another reason the monarchs are decreasing?’ Yes, Joaquin.”

Class (represented by Joaquin): “Pesticides is another reason they are decreasing in numbers.”

Teacher: “I don’t remember reading that in the article, so I am going to ask Joaquin, ‘Can you show me where it says that in the text?’”

Class (represented by Joaquin): “Right here it says, ‘These include habitat loss and pesticides.’”

Teacher: “I need to figure this out. The article says habitat loss and pesticides, so I want to see if we can figure out these two things. I am going to ask you,

partner B, a question to help me understand this more. ‘What do you think it means by habitat loss?’ How can you respond? Georgia.”

Class (represented by Georgia): “In science we studied that a habitat is where animals live. So, where the monarchs live is being destroyed or isn’t around anymore.”

Teacher: “Good job, Georgia. Can you follow up with a question to me?”

Class (represented by Georgia): “Do you agree with me?”

Teacher: “That works, Georgia. I can also paraphrase what you just said. ‘So, you think that monarchs are decreasing because their habitat has changed.’ I am going to check with Georgia to see if I am correct. She is nodding so I am going to add a question. ‘So, do you think the pesticides have affected the habitat?’”

Class (represented by Georgia): “Yes. Were there any other reasons mentioned in the article?”

Teacher: “Good job checking to see if we have discussed all the reasons, Georgia. I am going to see if we can summarize the reasons. ‘I think that is all of them. Can we summarize what we just discussed?’”

Class (represented by Georgia): “Throughout the discussion we made decisions about how to deepen our understanding through our discussion.”

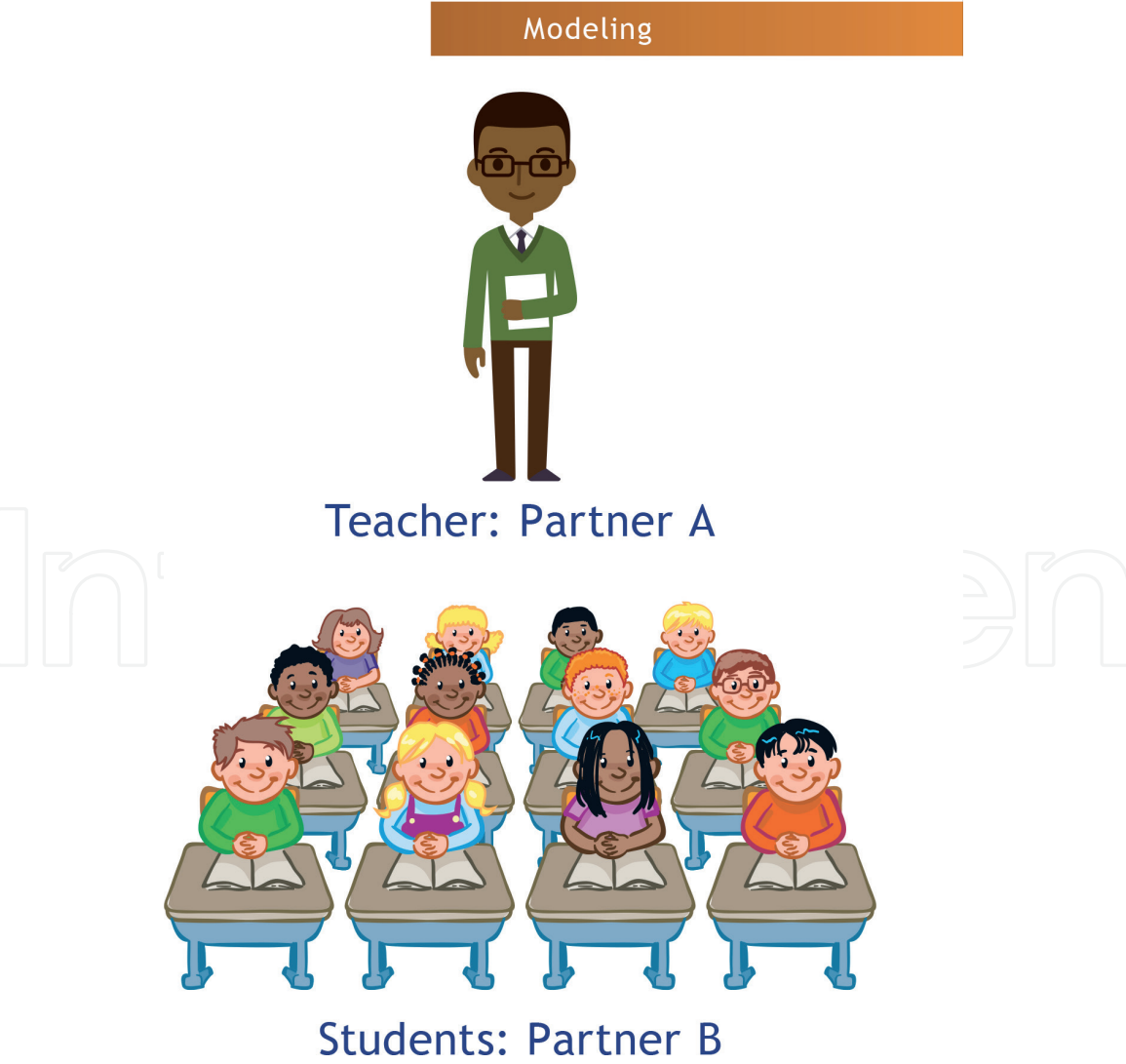


Figure 9.
Modeling.

In this scenario, the teacher utilized a model as a way for her students to “see and hear” what a good conversation sounded like. Another strategy we have found to be effective is using a non-model, i.e., a poorly constructed conversation. The teacher provides students with a non-model and asks them to work in pairs to improve it. Initially, the teacher works with the entire class and a projected conversation, asking them first to improve one aspect of the discussion. She then asks them to focus on another aspect of the conversation before increasing the rigor of the task by having them work independently with a partner.

A similar strategy is the fishbowl where 2–4 students sit in the middle of the classroom and engage in a discussion while the remaining students sit in a circle observing them. Based upon what the teacher has observed in previous classroom discussions, she assigns specific things the observers should be looking for while the fishbowl is going on. For example, the teacher might ask different sets of students to listen for certain discussion skills (e.g., clarifying an idea, adding on to an idea, providing evidence for an idea) while others listen for norms of interaction (e.g., looking at the speaker, taking turns, being respectful). When the discussion is over, the teacher and students debrief what students notice during the activity. The teacher uses this opportunity to specifically point out the talk moves students made to enrich the discussion.

5.4 Teaching specific strategies

A great deal of research indicates that the explicit teaching of strategies to students will improve student learning and help them become more independent learners [28–30]. Our work with the SOAR Disciplinary Discussions Teaching Frame has also demonstrated that introducing and demonstrating specific metacognitive strategies students can use when engaged in discussions significantly improves their ability to recognize and address breakdowns that occur and ultimately keep the discussion (and learning) on track [3, 27]. The key to the successful teaching of strategies is explicitly demonstrating what the strategy is, how to use it, and when and why to use it. In the scenario that follows the teacher is introducing one of our research-based discussion strategies to her students.

Scenario for teaching specific strategies: as a class routine, Ms. O’Rourke has her students reflect on their discussions. She now wants to teach them a strategy she thinks will strengthen their discussions further. “You have really improved with your discussions because you have been reflective about what you are doing well to deepen your discussions and about those areas that need improvement. Nonetheless, I have noticed that there are times when your discussions seem to stall or shut down, so I want to teach you some strategies to help. What seems to happen is one of you stops talking because you do not know what else to say or you are confused about the topic. Let us review how we have defined metacognition. Turn to your partner and discuss what metacognition is and give an example when you have acted metacognitively.”

After students have had a chance to discuss, Ms. O’Rourke has them share. Then she says: “So, as you stated, you first need to be aware that your discussion has stalled and that you do not understand what to do. Once you are aware, you need to take some action to get the discussion moving again. I have

a reference chart here on the white board for us to discuss. (See **Table 2.**) One thing you can do is reread the prompt. This gives you an opportunity to refocus your thinking and come up with some ideas to add to the discussion and move it along. It also gives you a moment to clarify the prompt if necessary. Another strategy is you can summarize what you and your partner have said so far. By summarizing the discussion, you are ‘retracing’ the discussion to see where it broke down. You might find that a question or comment took your discussion off topic which caused it to stall. The third strategy is to ask your partner for help to get back on track. You could say, ‘I can’t think of anything else to say. Can you ask me a question or make a comment to get us moving again?’ Or you could say, ‘I am not sure if I’m on the right track with our discussion. Can you help me get back on track?’

I really want you to be thoughtful in your discussions and use these strategies if you get stuck. When you have completed your discussion, I am going to ask you and your partner to process your use of these strategies: Did you reread the prompt, summarize the discussion, and/or ask your partner to help?”

It is important for teachers to monitor student discussions to be able to determine what strategies need to be demonstrated and why, when, and how to use them. In the scenario above, Ms. O’Rourke demonstrated for her students what they could do when one partner (partner A) realizes their discussion became stalled because he is not understanding.

Another possibility for why the discussion breaks down and students are not going deeper to co-construct their knowledge can be because partner A realizes that partner B is not understanding. The third possibility is that both partner A and partner B realize the discussion has stalled and they need help to move forward. In both of these cases, the teacher would demonstrate what she has seen in the discussions and explain and model the steps (see **Table 3**) that could be taken to deepen the discussion.

5.5 Guiding student use of strategies and processes

To use strategies independently, students need metacognitive knowledge about their own abilities and attitudes, what strategies are effective and available, and the particular type of activity they need to do. Carefully designed guided practice, with a gradual release of responsibility built into the instructional sequence, enables students to develop this knowledge and the confidence they need before applying them in independent practice. At this stage learners also need timely, constructive feedback to determine how effectively they are learning and applying the discussion skills. The final scenario describes how a teacher in the SOAR project monitors and guides his students as they use the processes and strategies they have been learning.

Scenario for guiding student use of strategies and processes: Mr. Lu has introduced metacognition, engaged his students in the reflective process, deconstructed the reflective process, and taught metacognitive processes and strategies to his class. As a result, he feels they are being more metacognitive in their discussions. He is

now monitoring and guiding his students in using those processes and strategies automatically. “You all have grown so much in working with your partners to co-construct your learning through your discussions. I see you using the metacognitive strategies we have discussed. Today, while you are having your discussion, I will be walking around listening to how you are using those strategies to regulate your discussions. I might ask you a question or set down a discussion prompt card (see **Figure 10**) as a reminder of what you could be doing to strengthen your discussion. Let us look at the cards so you are familiar with them. This one says, ‘Summarize your ideas.’ Which problem does that refer to? Yes, ‘I don’t understand.’ This one says, ‘Paraphrase your partner’s ideas.’ Yes, that matches ‘My partner doesn’t understand.’ This one says, ‘Retrace the discussion.’ Yes, that is, for ‘We need help to move forward.’”

If... or when....	Then I can
I don't understand	Reread the prompt to refocus my thinking. Summarize my ideas to clarify my thinking. Ask my partner for help to get back on track.

Table 2.
Metacognitive strategies A.

If... or when....	Then I can
My partner doesn't understand	Paraphrase my partner's ideas to help her refocus her thinking. Ask a question to prompt my partner to reconsider her thinking. Explain my thinking to move my partner beyond her misunderstanding.
We both need help to move the conversation forward	Clarify why the discussion has stalled to figure out how to move forward. Retrace the discussion to identify where the breakdown occurred. Explain why we are stuck and ask for help to enable us to move forward.

Table 3.
Metacognitive strategies B.

Getting students to monitor and guide their own discussion can be challenging. A unique strategy to help students do this is with the use of technology. Pairs of students can video tape themselves having a discussion using an iPad, Chromebook, or phone. Ask a pair if they would allow the class to view their video as a model. Take this opportunity for students to share the strategies they saw the students in the video use appropriately as well as any suggestions for improvements. Have the rest of the class watch their own videos and provide a checklist or graphic organizer for students to record what they did well and the areas they could improve upon. Debrief as a class. Finally, have students record another discussion with the goal of incorporating those strategies they need to improve.

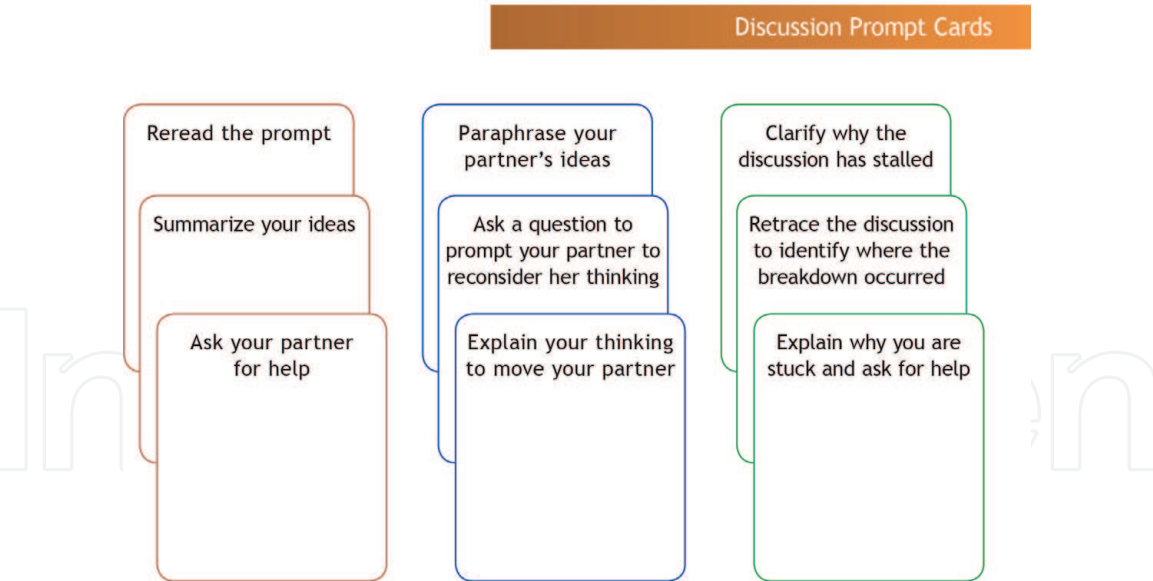


Figure 10.
Discussion prompt cards.

6. Conclusion

Instructional practices that help students develop a reflective and strategic approach to learning, i.e., teaching for metacognition, need to be embedded across the curriculum and throughout the school day. Accomplishing this goal requires instructors to think metacognitively about their teaching and to use instructional practices strategically, i.e., teaching with metacognition. In this chapter we have explained these concepts as well as how the SOAR Teaching Frame for Disciplinary Discussions can be used to support them.

In addition, we have introduced a framework called the stages of teaching for metacognition in disciplinary discussions. This framework, as well as the research-based instructional strategies and classroom scenarios that support it, can be used to help students develop a range of metacognitive strategies for remaining actively engaged in disciplinary discussions. It also provides insight into the stages of the framework by illustrating the dynamic and interdependent ways in which they work together to drive both teacher growth and student learning.

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