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Metacognition – Cultivating Reflection to Help Students Become Self-Directed Learners

Overview

Reflection is an act of looking back in order to process experiences. Metacognition, a type of reflection, is a way of *thinking about one's thinking* in order to grow. Metacognition and reflection are terms often used interchangeably, but it is most helpful to distinguish metacognition as a particular form of reflection. Often instructors and students think about reflection as one specific genre that never changes—a letter or a note to an authority figure about what was done effectively and what could be improved. But this doesn't have to be the case. At its best, reflection is not a static form. It can work in many dynamic ways: talking, blogging/vlogging, writing letters, formal essays, etc. Teaching your students to practice reflection in a variety of ways can facilitate more effective and fulfilling metacognition.

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General Considerations

Coursework can train students to think not only about the subject matter of the field, but also about how they acquire knowledge in relation to society or a specific social context [i.e. a particular scholarly or practical community]. Students who learn to think about how their academic environments affect their learning strategies are more likely to develop the ability to transfer knowledge among varying contexts. Here are some rules of thumb that make for effective reflection:

1. Students need explicit training to practice reflection and metacognition. Experience shows that the best way to develop students' metacognitive abilities is to teach metacognitive strategies hand-in-hand with the course content. The most effective metacognitive training happens when you talk explicitly with your students about why metacognitive practice is useful. You should also provide specific, guided prompts that consistently direct students' thinking throughout the course. For example:

- Have students work in groups to parse out the prompt for a new paper, asking each group to complete a portion of the "Pre-Write" exercise (see "Planning Exercises: Strategy 2" below) and then report back to the class. This allows the class to work collectively to imagine strategies that students can then tailor to their individual needs. They can learn from their peers' ideas as well as from your feedback in the class discussion.

- Contribute to a class blog as they work. For instance, ask students to post calls for help when they hit an obstacle or become frustrated in some way. Likewise, you might ask them to post when they experience a moment of triumph in their work—perhaps when they found the perfect source after a long search, or when they had an epiphany about a great way to start an essay. These kinds of in-the-moment posts (which can be very brief) help students not only to observe their own process but also to make use of their classmates' potential advice and encouragement. Such contributions build a record of reflection that students can return to later for self-evaluation.

2. The best reflective assignments respond to an authentic problem or a disagreement that needs to be resolved. Otherwise, reflective assignments can be counterproductive by allowing students not to think but to get by operating on autopilot. For example, many students have come to expect being asked to write self-assessment letters to professors making a case for what grade they think a particular project should receive and why. Thus, many students automatically write about the effort they spent (often in terms of hours or days, rather than anything concrete to actually illustrate effort). They also may acknowledge that they have "some trouble with grammar and punctuation" and then suggest an 'A' or a 'B' and call it a day. In a response like that, virtually no self-assessment is actually happening, because students assume they already know the genre and its markers, and they fill in what they perceive to be the expected answers. Often instructors assign grades that disregard the self-assessments or creatively "average" their own assessments with the students', thereby proving the exercise fairly useless for both parties. A small adjustment, such as asking students to create a Post-Write (see "Evaluation Exercises: Strategy 3" below) *after* they receive a grade from you, will help students understand how each element of their process affected the product. You also might consider allowing the Post-Write to serve as an argument for a separate grade or as a blueprint for a revision that could lead to a re-grade.

3. The best reflection is often social/collaborative. Social activity is an essential part of reflective practice; by reflecting together occasionally, students can begin to understand their own learning in relationship to other people's learning styles and experiences.

4. Reflection in the midst of a process can be as helpful as reflection after the fact. Reflection can be powerful in a moment of problem solving (reflection in-action) or after problem solving (reflection-on-action). Reflection-in-action, however, allows learners to disrupt bad habits and shift gears as they recognize unproductive strategies. It's *most* useful to establish a reflective practice of setting goals beforehand, monitoring progress as students work, and evaluating the outcome compared to original goals after the fact.

5. Reflection should be consistent and responsive. It's most effective when it happens often (in a variety of ways), and when you respond promptly (whether in writing, in class, or in some other way). Encouraging a variety of formal and informal reflections allows students to receive different kinds of feedback at multiple stages without overburdening your own preparation time. For instance, across the course of a semester, you might assign:

- Semi-regular informal in-class reflections that you read and respond to in the next class (perhaps condensed versions of the Pre-Write and Post-Write activities mentioned below)
- Self-reflective comments (on various project drafts) to which you respond individually in writing
- Collaborative troubleshooting exercises that you have students report back on and respond to in the moment.

In Practice

Reflection & the Metacognitive Cycle

In this section, we focus on activities and exercises you can use in and out of the classroom to provide the explicit training that will develop students' reflective and metacognitive skills. People who study metacognition think about it in terms of metacognitive cycle, which at its most basic includes:

- planning
- monitoring
- evaluating

In the next section you'll find several strategies for incorporating reflection at each stage of the metacognitive cycle.

Strategies for the Classroom

"Planning" Exercises

In the planning stage, students think ahead to upcoming assignments and identify what tools, skills, knowledge, and resources they already have and what they will still need to acquire in order to get the work done. They also set goals for the tasks and develop strategies for achieving those goals.

> ***Strategy 1: Role Playing.*** In terms of helping students understand who they are as learners in various communities, you can provide roles for students to play as they work on mastering elements of course content. This leads to a particular environment that supports the range of roles created, and challenges students to respond to the material—*and* the conversations in the course—in those roles. This can be a useful strategy for in-class discussions, peer review sessions, and written homework, such as blogging, essays, or reports. For example, before students begin an essay or project, talk to them about their role in the assignment (i.e. their role as the author). That is, they would benefit from thinking not only about who their *audience* is, but who *they* are as they address that audience.

You can certainly let them determine the role they want to play, however, in early iterations of this process, it helps if you provide a specific role, particularly one that they wouldn't automatically take. For example, if the assignment is to make a case for lowering the legal drinking age, you might ask students to write their essay/create their presentation/build their site (whatever the task may be) as a concerned parent, or a conservative legislator, or a university president. This way, students must reflect on the differences between how they themselves might argue the case and how someone in another position might argue differently. They would reflect on their own identities, leanings, and perspectives, and then they would actively investigate or brainstorm those of the role they've assumed.

Strategy 2: Pre-writing. As you begin a new project (or exam, unit, essay, etc.), ask students to examine the prompt and write a reflection that does some or all of the following:

- Paraphrases what the project is calling for them to do in terms of the "big picture"
- Identifies (in their own words) the individual pieces, or tasks, or processes that will need to happen for them to successfully complete the project
- Identifies areas of the prompt that require clarification
- Identifies and articulates their role as the author/architect of this project (Who are they in the big picture? To whom are they speaking? For what purpose?)
- Considers the purpose of the assignment—what is its role in the course, but also how might it help them in the future?
- Lists or sketches out what they will need to know and/or know how to do in order to complete the project
- Lists or sketches out what they already know/know how to do in relation to the assignment
- Lists or sketches out what they will need to learn (a research question to pursue, a skill they need to develop, a tool they need to figure out how to use, etc.)
- Lays out a plan of action (the more specific it can be, the better … including self-imposed deadlines for "deliverables")

Because research has shown that reflection is often effective when it's social, it would be nice to give students time in class to break into pairs or small groups so they can share the results of their pre-writing exercise and discuss their reactions to the prompt. Furthermore, if you read these pre-writes quickly and respond to their questions for clarification as soon as possible, you can help students identify strategies they might need to reconsider before they begin, or course-correct misunderstandings about the project. You might want to look for common questions that you can clarify in the classroom, and then respond to any that need individual attention either in writing or via conference.

"Monitoring" Exercises

In the monitoring stage, students check in with you (and/or themselves) *during* the course of their work and report how things are going and where they might need to adjust or adopt new strategies. (This kind of reflection during a task is often referred to as "reflection-in-action".) Students have indicated that these kinds of exercises often lead to the most productive reflection and learning opportunities.

Strategy 1: Collaborative Troubleshooting. Have students help each other out, either in a lab or with groups or partners, by reflecting on problems whenever they arise. For example, if students are working in class on drafting introductions, encourage them to turn to their neighbors to talk about what they're struggling with *as they write*.

Strategy 2: Post Peer Review Follow-Up. After giving students time to read and consider the feedback they receive in a peer review, have them actively engage with that feedback as they plan their revisions. For example, ask them to choose something a peer disliked or disagreed with and respond to it in writing or in direct conversation with their peers. Alternatively, have them explain why they plan to follow a peer's particular piece of advice, and/or explain why they have considered and dismissed a peer's particular piece of advice.

Strategy 3: Self-Reflective Comments On Drafts. As students draft papers or other projects, ask them to insert a few comments that do the following: identify areas of struggle; ask for a specific piece of advice; and explain why they believe something specific aspect is already working well. Then, when you respond to their work, you can engage in direct conversation with them via those comments. For a thorough demonstration of how this practice can work, along with sample handouts you can provide to your students, refer to **Supplement 1: "Inserting Self-Reflective Comments."**

Strategy 4: Troubleshooting Journal. In this journal, students make note of any time they have a question or hit a "roadblock" in their work. Once they've noted the issue, they can seek help by talking to peers or to you, or by consulting other resources. They should keep an active record of their troubleshooting process, noting what strategies seem successful, and what strategies seem less so (and why). You can make this journal more productive by:

- Establishing a minimum number of entries, depending on your anticipation of or experience with the kinds of trouble students run into with the project you're assigning.

- Discussing with the class what kinds of problems might arise (and when) and explaining how they can become aware that they're in need of troubleshooting in the first place. For example, many students deal with "writer's block" of some kind when writing essays. Maybe they struggle with developing a thesis, or organization, or writing a conclusion, or integrating evidence. However, many students don't necessarily automatically think: "This is a roadblock. How can I get around it?" Therefore, you'll need to prime them to be more intentional about identifying and dealing with the challenges of writing.

"Evaluating" Exercises:

Finally, in the evaluating stage, students look back on the work they've done and reflect on the strategies, tools, resources, and/or processes that served them well. They should also think about what didn't work as effectively, what they learned in the process, what they achieved, and how they might translate—or "transfer"—the experiences, skills, and knowledge gained to another context. (This kind of reflection is often referred to as "reflection-on-action.")

Strategy 1: Dialogue About Feedback. Once students have had time to review your feedback on a project, ask them to write a letter back to you that addresses the following questions: What was most clear and helpful to you? What was your biggest take-away? What suggestions about revision do you agree with? Why? How will you put those into practice? What suggestions about revision do you disagree with? Why?

Strategy 2: Articulate Transferable Skills. Have students write a reflection in which they discuss a skill that the project helped them develop and ask them to imagine how the next writing experience could be made easier, more effective, or more efficient based on this writing experience. You might also ask them to imagine how they would solve problems in other writing scenarios or classes, such as other fields or professional work. For example, if they struggled with creating a cohesive narrative in a personal essay and used storyboarding to visualize what they were trying to do, how might they use that same skill in, say, a marketing course or in a job as a geologist?

Strategy 3: Project Post-Write. A post-write can be an effective way of getting students to think carefully about their process, the product, and the assessment of that product. After you've handed back a graded project with your feedback, invite students to consider how well their planning and/or monitoring strategies worked, and why they earned the particular grade (or other form of assessment).

The post-write may take many forms, from a simple worksheet providing questions to answer, to an informal letter of advice to future students taking on similar projects, to a formally written reflective essay. Some questions you may want to have students consider are:

- How much time did you spend on this project?
- How was that time organized? For instance, about how much time did you spend on each of the following (the individual tasks will vary from project to project):

  - ☐ Creating a plan of action
  - ☐ Research
  - ☐ Reviewing course notes
  - ☐ Talking with your peers
  - ☐ Talking with your instructor
  - ☐ Visiting the Writing Center
  - ☐ Learning a new tool
  - ☐ Pre-writing
  - ☐ Drafting
  - ☐ Revising

- Given the time you spent on various aspects of the project, and the feedback you received, what would you do differently if you were to do it over? Why? What would you do the same? Why?

- What kind of plans and strategies did you make for completing this project? To what extent did you follow those plans? How and to what extent did they change as your work progressed?

- Looking at the feedback you received on your project, what strategies proved most effective for you, and how? What strategies didn't work, and why? Based on your answers to these questions, what could you do differently next time to increase your chances of success?

Final Thoughts

The exercises suggested for each stage of the metacognitive cycle can be productively mixed and matched in a variety of ways. For instance, one effective combination is to use Planning Strategy 2 (Pre-Write), Monitoring Strategy 3 (Self-Reflective Comments), and Evaluation Strategy 3 (Project Post-Write) for one project or unit. We do suggest that you try different combinations—not only to find what seems most relevant and appropriate to your course, but also to keep students from falling back on rote responses when they get too used to a particular pattern.

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