

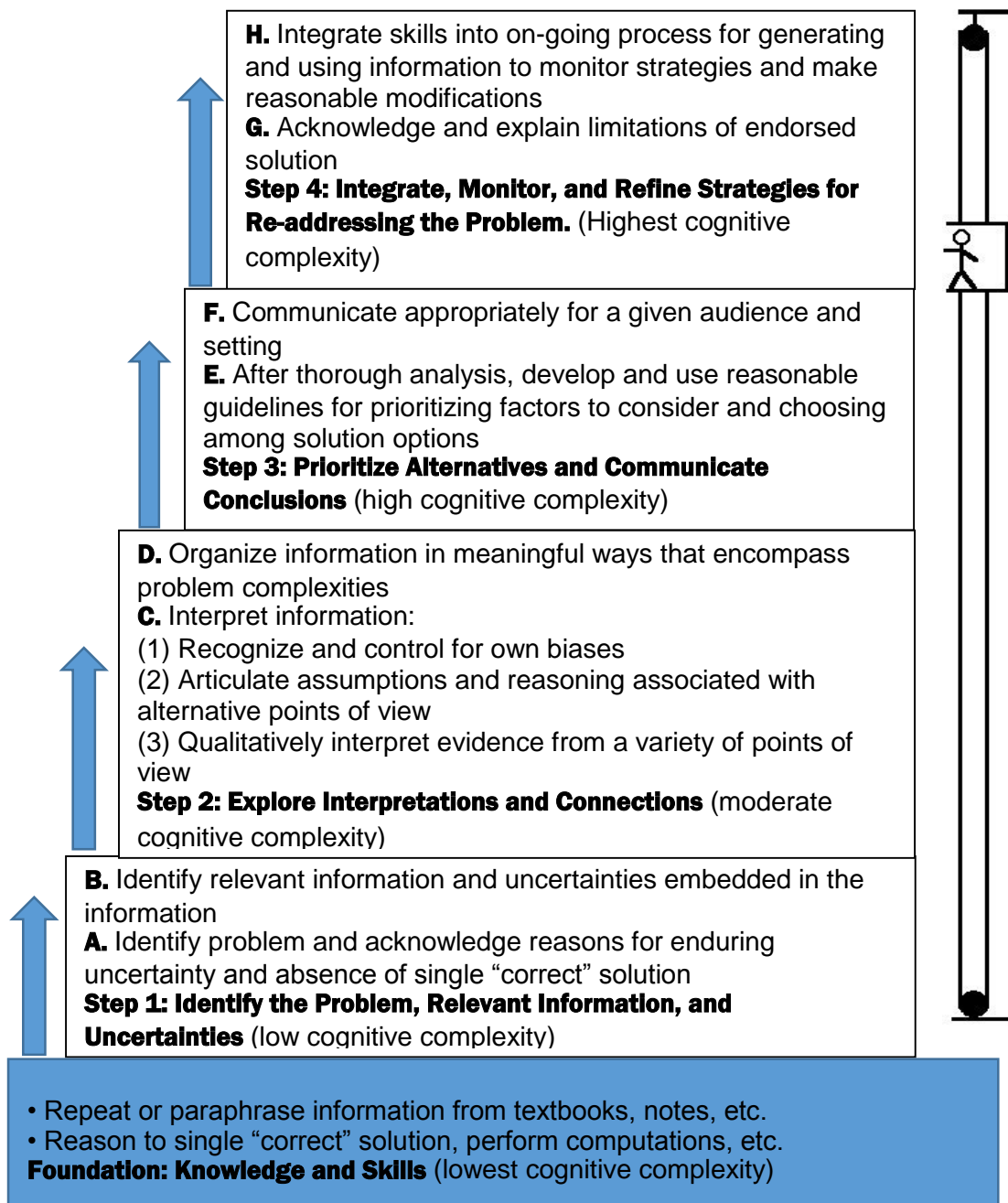
Skills for Improving Critical Thinking and Argumentation Course

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1 Developing thinking skills

Figure 1, demonstrates steps for better thinking designed by Cindy L. Lynch and Susan K. Wolcott. As a result, when students acquire thinking skills, encountering open-ended problems, they will be able to manage them in their professional life.

Figure 1. Steps for better thinking [1]



2 Some lessons for developing critical thinking skills

There are six lessons from cognitive science for teachers of critical thinking to help their students for improving their critical thinking skills (Tim van Gelder).

First, being expert in critical thinking is hard. Because human being are not critical by nature, so they should not be expected to acquire expertise in it overnight. It should be considered as a long-life journey rather than considering it accessible as a two-week module.

Second, practice in critical thinking skills themselves enhances skills. The practice should be deliberate, which means it is not only enough to think critically about a topic, but also engaging specific exercises related to critical-thinking improvement is necessary.

Third, the transfer of skills must be practiced. Transferring the skills from one situation to another is essential for students to practice. Because usually a skill picked up in one situation cannot be applied in another situation.

Fourth, some theoretical knowledge is required. A critical thinker improves in case of acquiring knowledge about the theory of critical thinking, because it provides a situation for receiving feedbacks from teacher.

Fifth, diagramming arguments, “Argument Mapping”, promotes skills. Argument constitute a body of evidence in relation to some proposition. The proposition is expressed in some claims and the evidence is explained in other claims. It is beneficial to draw maps that make the logical structure of the argument completely explicit. So asking student to draw a map of their reasoning helps to enhance their argumentation skills.

Sixth, students are prone to belief preservation. Belief preservation is the tendency to use evidence to preserve our opinion rather than guide them (Douglas 2000). So a good critical thinker, searches for those evidences, which are opponent to his or her current beliefs, respects to those arguments that goes against her position and is ready to open her mind to those more proper evidences.

3 Critical Thinking Skills in New Contexts

3.1.1 Critical Thinking Skills

Multiple Solutions - Generating more than one option to meet a given set of criteria.

Multiple Solutions provides resources on ways to discourage satisficing and encourage flexible and divergent thinking in your students.

Students can assume all problems have one "right answer." The strategy involves confronting students with their own divergent thinking, and then asks them to synthesize these ideas into a "best" answer.

Ethics - Reasoning based upon the fulfillment of one's moral duties.

In any real context, determining what actions will have both impact and integrity requires a special kind of critical thinking.

Ethical discussions are difficult, but this teacher taps into an acute sensibility that students already possess.

3.1.2 Featured Teaching Strategy

Case Studies - Using a story with a carefully arranged set of facts to stimulate critical thinking.

In class, events and situations from outside the classroom are often simulated or represented using cases studies, so this module provides insights and techniques on how to find, create, and use case studies well.

A case study in the use of case studies: How to select good cases for your students to analyze, evaluate, and integrate.

4 Metacognition

"Metacognition" or "self-regulated learning" is thinking about our thinking. This ability assists critical thinkers to enhance their ability to evaluate the success of current approaches.

4.1.1 Metacognitive Knowledge

Can be described as follows:

- **Declarative knowledge** - Knowledge about one's self as a learner and what can influence one's performance.
- **Procedural knowledge** – Skills and strategies. Knowledge about how to do things.
- **Conditional knowledge** - Knowledge about when and in what conditions certain knowledge is useful.

4.1.2 Metacognitive Regulation

The process of managing one's own learning, and includes planning, monitoring, and evaluating.

4.1.3 Metacognitive Skills

Reflection - Assessing one's own thoughts, actions or work.

As the doorway to deep learning, reflection in any form is crucial for students to continually improve their own critical thinking habits.

To allow for genuine reflection, you must provide a structured opportunity for it to happen. A reflection notebook can be a place where students make written connections between course content and the rest of their lives.

Feedback - Eliciting and evaluating responses from others to what we say or do.

Verbal and written feedback can enrich the thinking of all involved, whether the feedback is teacher-to-student, student-to-teacher, and student-to-student.

Engage student's right when you see they are integrating their own interests with course material. In these moments, help them feel safe to be uncertain, and to explore their own doubts and questions.

4.1.4 Featured Teaching Strategies

Think-Pair-Share - A simple, brief technique to energize any classroom in as little as 2-minutes. Students think about the question, pair with a peer to share thoughts, and then receive feedback as a class.

This activity requires students to reflect on their knowledge in order to explain their reasoning to one another. The question you ask students must be difficult enough for students to benefit from conferring with their peers. If everyone can answer the question quickly on their own, then there is no reason to confer and students can drift off-topic.

Three Step Process

1. Ask the class a relatively difficult question related to the material you are covering in class that day. Multiple-choice questions work best for this (put the question on the board or overhead). Give students about 30-60 seconds to think about the question individually. If you use a classroom response system, like I Clickers, then have students enter their answer.
2. Then allow students to confer with others, either in groups or simply by talking to the person next to them. Encourage them to find someone close by who has a different answer. "Come to consensus with your neighbor on the right answer" is a nice way to spur discussion.
3. Finally, after giving students some time to talk, reconvene the class and ask students to share what they discussed. If the question you asked has a correct answer, an effective way to begin the discussion is to ask someone who got the correct answer why they chose it. Knowing they got the correct answer can embolden one to speak, even in a very large class.

Students will be more interested in each other's' thoughts if you ask them to make a decision first as individuals and then in pairs. A simple example is a multiple choice question, which you ask students to think about individually and then ask them to convince their neighbor of their answer. When you reconvene as a whole class, you can then ask pairs to report back their decision with a show of hands, and ask pairs who came up with different answers to share their thinking with each other.

Sometimes, the person who has just learned something can be the very best teacher of that concept. Students working with each other can recognize misconceptions in their peers that we as teachers may have overcome a decade or more ago--and possibly even forgotten were possible.

Learning Portfolios - A purposeful collection of student work and student reflection upon that work to stimulate individualized learning and teacher-student dialogue.

What exactly is a learning portfolio?

A learning portfolio is a collection of student work samples (e.g., a three-ring binder, Evernote, or web site) and some form of reflection by the student upon that work. As part of what some call "authentic" assessment (Sunstein, 2000), portfolios can give more robust evidence of student learning than can, say, a multiple-choice test. Recently, many have discovered that Canvas can be an efficient way for students and instructors to organize and exchange portfolio information, thereby limiting the back-and-forth exchange of clunky objects like three-ring binders and enabling collaboration portfolios (Liu, 2007).

5 Argument mapping

What it is: Using specialized software or a pen and paper, students draw maps of an argument's structure. Though they can be done a few different ways, argument maps are usually drawn with boxes and arrows. Claims are placed in boxes, which are then arranged so that some claims are reasons for believing others, with each "branch" representing a separate reason supporting a conclusion.

Why it might be worth trying: Argument maps allow students to see the underlying structure of an argument; for example, they can see the "chain" of reasons that support a position. Some argument mapping software also allows students to visually sort out and label stronger and weaker arguments. Some early research on cognitive mapping suggests that it may be more effective than summaries or outlines, arguably because the student is using two different pathways – the visual and the verbal – to process information (Nesbit & Adesope, 2006).

Applications:

- Ask students working alone or in small groups to map the argument in one of the course readings.
- After writing a paper – and before you grade and respond to it – ask students to exchange papers, create argument maps for the paper they read, then revise their own papers based on their peers' map.
- Ask students to draft argument maps instead of outlines for large, complex papers. (You will, of course, likely have to award points to and provide feedback on this work).

Potential pitfalls:

- Argument mapping is labor-intensive, both for you and the students.
 - Optimally you should give some time for students to practice and check their work in class
 - Students will need prompt, careful feedback on their maps, especially early on.
- It is also somewhat difficult for students to learn, though the suggestions in Charles Twardy's article and in the Austhink tutorial (listed in "Resources" below) may go a long way here.

6 Scaffolding assignments

What it is: Scaffolding assignments involves structuring parts of a single assignment or designing a sequence of assignments so that they gradually increase in cognitive complexity. For example, the first part of an assignment might ask students to summarize an argument; the second might ask students to identify assumptions anchoring the argument; and the third might ask them to compare and evaluate several arguments on the same topic.

Why it might be worth trying: Recent studies focusing on the development of expertise suggest the importance of “deliberate practice.” One important feature of deliberate practice is its graduated structure: it involves mastering easier tasks before tackling more difficult ones. Importantly, deliberate practice also gives the student ample opportunity to receive and act on feedback.

Examples:

- **Breaking up an assignment into several parts.** For example, rather than handing in one research project at the term’s end, students are asked to write three short papers. In the first they define a problem and identify two or more positions on the problem; the second asks them to evaluate the evidence and assumptions behind each position; the third asks them to draft an argument endorsing an existing position or creating a new one.
- **Keeping assignment constant but increasing the difficulty of material** (readings, arguments, problems, etc.). For example, students are asked to summarize articles for each week’s readings, but the readings themselves increase in complexity and abstraction.
- **Creating a scaffold within a single assignment.** An art history professor teaching a freshman class assigns a paper asking students to 1) Describe DeKooning’s painting *Woman,I*; 2) Explain how it is that the painting represents a woman (or all women); 3) Connect specific formal properties of the painting to ideas about women; and 4). Reflect on their own arguments in numbers 2 and 3 and identify some assumptions about art or creativity.

Bloom's Taxonomy

Competence	Skills Demonstrated	Related prompts
Knowledge	<ul style="list-style-type: none"> • observation and recall of information • knowledge of dates, events, places • knowledge of major ideas • mastery of subject matter 	list, define, tell, describe, identify, show, label, collect, examine, tabulate, quote, name, who, when, where, etc.
Comprehension	<ul style="list-style-type: none"> • understanding information • grasp meaning • translate knowledge into new context • interpret facts, compare, contrast • order, group, infer causes • predict consequences 	summarize, describe, interpret, contrast, predict, associate, distinguish, estimate, differentiate, discuss, extend
Application	<ul style="list-style-type: none"> • use information • use methods, concepts, theories in new situations • solve problems using required skills or knowledge 	apply, demonstrate, calculate, complete, illustrate, show, solve, examine, modify, relate, change, classify, experiment, discover
Analysis	<ul style="list-style-type: none"> • seeing patterns • organization of parts • recognition of hidden meanings • identification of components 	analyze, separate, order, explain, connect, classify, arrange, divide, compare, select, explain, infer
Synthesis	<ul style="list-style-type: none"> • use old ideas to create new ones • generalize from given facts • relate knowledge from several areas • predict, draw conclusions 	combine, integrate, modify, rearrange, substitute, plan, create, design, invent, compose, formulate, prepare, generalize, rewrite
Evaluation	<ul style="list-style-type: none"> • compare and discriminate between ideas • assess value of theories, presentations • make choices based on reasoned argument • verify value of evidence • recognize subjectivity 	assess, decide, rank, grade, test, measure, recommend, convince, select, judge, explain, discriminate, support, conclude, compare, summarize

7 Conclusion

After studying different materials for critical thinking and argumentation, which are mentioned above, I believe in addition to current methods using in our course such as multiple solution, ethics, feedback and case studies, using some other methods can enhance the efficiency of the course.

Firstly, this essential and basic point should be taken into consideration that in the beginning of the course students should be provided with a foreground about critical thinking and argumentation skills. Although learning those skills and being skillful in them needs a long time and should be practiced, it is beneficial to at least make students familiar with those skills and give them some ideas. In this way, they are more liable to go through thinking critical.

Secondly, asking students to provide a reflection notebook, where they are able to write the connections between course content and the rest of their lives, also improves their thinking skills.

Thirdly, enjoy using another simple and effective technique named “Think-Pair-Share”, in which students think about the question, pair with a peer to share thoughts, and then receive feedback as a class.

Additionally, drawing argument maps can be considered as another tool for improving this course.

Using argument maps is beneficial because through it, students will perceive the depth and underlying structure of an argument.

Finally, scaffolding assignment can be considered another good method for this course. Nowadays researchers put a lot of effort on proving how deliberate practice can be a remarkable opportunity for students to learn.

8 Resources

[1] Cindy L. Lynch and Susan K Wolcott, 2001. Helping Your Students Develop Critical Thinking Skills. [Pdf] The IDEA Center Manhattan, Kansas. Available at:

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[5] Office for teaching, learning and assessment, 2008. Argument mapping. [Doc]. Available at:

<<http://teachingcommons.depaul.edu/Documents/Argument%20mapping.doc>> [Accessed 7 April 2015].

[6] Office for teaching, learning and assessment, 2008. Scaffolding assignments. [Doc]. Available at: <<http://teachingcommons.depaul.edu/Documents/Scaffolding%20assignments.doc> > [Accessed 7 April 2015].

[7] Austhink. Tools for critical thinking, better writing and decision making. [Online] (2014) Available at: < <http://austhink.com/> > [Accessed 7 April 2015].