EXAMINING REASONING

CLASSROOM TECHNIQUES TO HELP STUDENTS PRODUCE AND DEFEND CLAIMS

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Examining Reasoning

One of the more challenging instructional undertakings for 21st century educators is teaching students how to examine and self-regulate their own thinking processes (reasoning), as well as critically evaluate the logic of presented content they encounter in the form of class discussions, various media formats and content texts. These two facets of *examining reasoning* are cognitively complex skills. You sometimes may find them to be difficult to execute in your own life and they are inarguably challenging to teach to students. You are not alone if you feel this way. In a study of the frequency of various observed content strategies, fewer than two per cent of observed instructional episodes contained opportunities for students to engage with new content by either learning how to think more logically and critically from direct instruction about reasoning *or* applying reasoning to content texts and discussions (Marzano & Toth, 2014).

These findings are not surprising when you consider the many roadblocks to teaching students how to produce and defend claims by examining their own reasoning or the logic of presented information, processes and procedures. These challenges include:

- extensive academic vocabulary and concepts that must be mastered by both teacher and students
- lessons that must be designed to show students how to engage in cognitive processes not readily understood by students
- instruction that must be married to rigorous content standards
- curricula and textbooks that may not support the instruction of critical thinking skills
- extensive teacher preparation and practice time that may not always be allocated
- extensive classroom instructional time that may not always be available

Here are some guidelines to use as an on-ramp to effective implementation:

- Become familiar with the academic vocabulary associated with the content. Select student-friendly definitions to consistently use in your teaching and then begin introducing and explicitly teaching these terms to students.

There are multiple ways to monitor for the desired result and these may look similar for many aspects of using the strategy discussed in this guide. Below are some examples of evidence demonstrating that your students are able to examine reasoning:

1. Students can describe errors or informal fallacies in information.
2. Students can evaluate the efficiency of a process.
3. Students can explain the overall structure of an argument presented to support a claim.
4. Student artefacts indicate that students can identify errors in reasoning.
5. Student artefacts demonstrate that students can identify and take various perspectives.
6. Students can identify support for their perspectives using the appropriate evidence.
7. Students are able to identify the support behind multiple perspectives.
8. Students can identify the evidence used to support the claim of others in presented information.

Scaffolding and Extending Instruction to Meet Students' Needs

As you monitor for the desired result of each instructional technique, you will likely discover that some students are not able to examine reasoning, while others can readily demonstrate the desired result of the technique you have taught. Knowing this, you must adapt for the needs of your students. You must plan in advance for those who may need scaffolding or extending of learning opportunities.

There are three categories of support you can provide for students who need scaffolding:

1. Manipulating the difficulty level of content that is being taught (e.g. providing an easier reading level that contains the same content)
2. Breaking down the content into smaller chunks to make it more manageable

Table 1.1 *(continued)*

Error	Description	Example
Evading the issue	Changing the topic to avoid addressing the issue.	Mum asks Sally how she did on her algebra test, and Sally immediately changes the subject to the cute boy that sits behind her in algebra.
Arguing from ignorance	Arguing that a claim is justified simply because its opposite has not been proven true.	A person argues that UFOs do not exist because there's no proof that they do.
Composition	Asserting something about a whole that is true of only its parts.	A person asserts that all police officers use excessive force because one officer has used excessive force.
Division	Asserting about all of the parts something that is generally, but not always, true of the whole.	A person asserts that a particular news reporter is liberal because all reporters are liberal.

Adapted from Marzano (2007).

The following table defines and exemplifies the second category of errors you may encounter anywhere—while at a faculty meeting, reading the newspaper, watching your favourite news panel, reading your students' essays or engaging your students in class discussion. Once again, this table is solely intended to familiarise you with the errors and refresh your memory regarding how they appear in typical arguments and assertions. At some point you may wish to prepare a handout for your students, but keep it simple.

Table 1.2: Errors of Attack

Error	Description	Example
Poisoning the well	Being so committed to a position that opposing positions are ignored.	I don't really care what the research says about the importance of vaccinating children. I know for a fact that vaccinations are dangerous.
Arguing against the person	Rejecting a claim using derogatory facts (however real or imagined) about the person making the claim.	I have a difficult time believing anything she says about global warming. Did you know that she flunked out of college?
Appealing to force	Using threats to establish the validity of a claim.	I could have you fired. The board president is a close friend.

Adapted from Marzano (2007).

Table 4.3: (continued)

How to Think	Question to Answer	Action to Take
Identify the backing: additional support for the groups.	What types of expert opinion, experimental evidence or factual information add further support to the claim?	List the additional types of support here.
Frame the qualifiers: exceptions to the claim, often expressed as the counterargument.	What types of information serve as nonexamples of the claim? Can you "disprove" any of the claims or offer alternative points of view?	List the qualifiers here.

Common Mistakes

There are many ways you can lose or confuse students when implementing this technique:

- The teacher omits the process of directly instructing students in how to extract meaning from the text.
- The teacher uses content text that is too difficult for many of the students.
- The teacher uses content text that does not have an obvious structure so that students can readily identify a claim and supporting details.
- The teacher does not adequately model by thinking aloud so that students can see how a skilled thinker tackles an assignment like this.
- The teacher tells students what to write down in each of the boxes in the organiser and does not hold them responsible for thinking.
- The teacher does more telling than prompting and facilitating.
- The teacher does not give students adequate time to process and understand the content before asking them to manipulate it at a higher level by producing and defending a claim.
- The teacher does not insist on clearly stated support for the claims that students make.
- The teacher accepts insufficient backing and unrelated evidence, thereby encouraging careless thinking and lack of accountability on the part of students.
- The teacher accepts faulty logic in the interest of not embarrassing students or being too eager to cover the material and move on.

Primary Nonexample of Judging Reasoning and Evidence

The nonexample teacher skips over any introduction of terms and setting of the stage. She does not model and think aloud for students. She simply hands out copies of the article and organiser and directs students to complete the assignment in their groups of four. She is unaware that two of the groups have encountered difficulties and are talking about an upcoming event at school over the weekend. Her mistakes are many, and could have been avoided by preplanning, providing an anticipatory set for the lesson, preparing and rehearsing a think-aloud and carefully monitoring what her students were doing. You could identify other mistakes as well.

Secondary Example of Judging Reasoning and Evidence

The secondary example and nonexample come from a Year 8 English classroom and are based the following content description: Use comprehension strategies to interpret and evaluate texts by reflecting on the validity of content and the credibility of sources, including finding evidence in the text for the author's point of view (ACELY1734). Here's how she introduces the assignment to students.

> Class, you have been working very diligently this term on a very difficult learning outcome. (The teacher has written out the above standard on the board.) I want to remind you of some of the new terms we've learnt. (The teacher points to a chart on the wall containing the important terms and their meanings.) In a few weeks, you will be taking an assessment to measure how well you have mastered this outcome. Some of you may feel very confident, but others are still a little shaky. I am going to model for you exactly how I would tackle an assignment like this using an article about global warming. Listen as I tell you what's going through my mind while I read this article and decide how to answer the questions in the organiser.

The teacher has duplicated an article about global warming for students to read. She incorporates many of the effective behaviours gleaned from both primary and secondary teachers she has read about. She directly teaches new academic terms and models her thinking aloud from a portion of the article. After these introductory

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