



Teaching Critical and Analytical Thinking across the Curriculum

Forum of September 2009

Overview and Report

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Can you imagine any modern form of reasonable education without critical and analytical thinking? Of course not! Or, let's put it this way: How seriously would you treat the teaching of critical and analytical thinking, if malpractice awards were granted against professors to students for their failure to succeed in professional life after their education? No kidding, folks. If you've just concluded that this question is nonsense, then you may be in need of reviewing all your teaching materials to date...

I began to set up this faculty development forum thinking about the diverse academic backgrounds of potential participants. Normally, having successfully acquired a university degree means that one's ability to apply critical and analytical thinking has been tested and found adequate.

Thus, in setting up a forum of this nature, attention had to be focused on the actual needs of faculty members as targets. Steps had to be taken to prevent exchanges from emerging as a mere talk-fest. The materials prepared for the forum needed to touch on the main points of orientation dealing with the traditional concepts of critical and analytical thinking. They needed to assist participants to recall, revise, to think about and to re-anchor the skills required to teach the same competence to students.

Here is a complete overview of the main teaching and learning materials presented for conference interactions:

AGENDA 01: Defining Critical Thinking (21-23 September, 2009)

2 Main Topics:

- Understanding and Relevancy
- Nature and Extent of Evidence Considered

AGENDA 02: Defining Analytical Reasoning (24-26 September, 2009)

3 Main Topics:

- Detecting Connections between Ideas
- Ambiguity and Conflicting Claims

- Supporting Data and Effectiveness of Conclusions

AGENDA 03: Teaching Critical and Analytic Thinking Skills (28-30 September, 2009)

3 Main Topics:

- Accepting Alternative Approaches and Techniques
- Using Sound Techniques to Maximize Learning
- Building Skills and Changing Attitudes

AGENDA 04: Writing Performance as Evidence of Critical and Analytic Thinking (01-02 October, 2009)

3 Main Topics:

- Clarity of Presentation
- Effectiveness of Structure
- Precision of Mechanics

Underlying the four agenda items were various questions submitted for consideration. The questions were meant to function as vehicles. As moderator, I interpreted my business to be concerned essentially with setting goals for the forum objectives and providing a strategy - by means of those vehicles - for getting there. A final conference titled: "Concluding Comments" was set up to enable all participants to help synchronize our final thoughts.

The four conferences were spread over the entire two-week duration of the forum. They were not all released simultaneously in advance for handling. Each week saw the successive releases of two conferences within the time frames attached to the agenda items as shown above. The purpose was to ensure the avoidance of idea duplications, and a better gauge for the separation of ideas from one conference and the other.

Thus, in each Conference, a fresh and clean slate was presented for a complete rethinking of the issues to match the corresponding set of new questions and Main Topics. This approach to course design and presentation was adopted with the number of registered participants (64 strong) in mind. It helped to prevent the danger of unnecessary fragmentation and duplication of exchanges with almost as much identical contents as can be expected, whenever the WT classroom is open to too many busybodies.

The potential of such a danger results almost always from a bad practice, namely, the undue proliferation of self-initiated sub-conferences or main topics that produce excessive clutter and idea scattering on the WebTycho conference space.

In addition, I configured the forum to allow our multi-dimensional academic backgrounds and diversity of disciplines to influence the interactions. The structure was intended to provide a wide scope for all colleagues, from either

DE or F2F, to put forward their own perceptions and interpretations of the subject.

If this venture was to be successful, it required to be a general platform for the exchange of ideas, for the re-examination of the rules and criteria governing critical and analytical thinking.

Participants appeared to have settled in comfortably by day two. The traditional WebTycho introductions at the initial stage revealed themselves as so civilized as to strike a chord and provide assurances that the forum would be free of any nasty mud-slinging. Hey, yes: If you are like me, this was definitely no mean feat. I have witnessed some fora in the past where competing academic views - a great deal of them bordering on irrelevance - were thrown around like confetti at a wedding...

Having set the stage for general interaction, it was now the turn of your humble moderator to sit back and absorb the conversational inputs of all and sundry. At least, this is what I thought. However, as it happens so often in online virtual communities, I found myself being drawn occasionally into the fray that I myself had unleashed. More specifically, I sensed myself as the receiving end of some inputs necessitating some direct intervention or clarification on my part. These were very rare cases, however.

Responses were lively and generally well-informed. But given the time constraints, in-depth concentration on main issues was - expectedly - missing at times. Also, direct preoccupation with a few key questions was ignored during the second half of Week2. At that stage, the handling trends expected of some main topics lacked comprehensive detail. Instead, they focused partially on subjective viewpoints, or random responses to the special interests of some participants.

Actually such trends, induced primarily by the very nature of the last discussion materials, were anticipated. They tended to discourage tinkering with the expectations of the Main Topics. Hence, the inevitable result was less interaction. However, this did nothing to damage the integrity of the final stage of the forum. On the contrary: In fact, all active as well as sporadic contributors of ideas helped in great measure to assimilate new thinking into the available discussion material. Some citations of good websites supplied by colleagues also added positively to flavor the forum.

A key objective was to use the forum to bring out what is latent about the seemingly abstract theme of critical and analytical thinking. Success in this regard could be driven by the application of sets of questions to open the doors to useful conversations, the sharing of ideas and the introduction of techniques.

Exchanges were characterized by enough flashes of deep thinking, wisdom, and real interest to offer the insights required to meet the needs of the Main Topics.

In the end, and after two weeks of due diligence, we had succeeded in conveying a significant amount of data to support the importance of, and the methods of, teaching critical and analytical thinking skills across the curriculum.

However, it's worthy of note that the actual materials of major educational value were, of course, the original ones submitted as an introduction to underscore the objectives of the forum and the basis for the Main Topics of Conferences. These included such allied documents as those stored in Webliography or as provided in conference by other colleagues. In addition to these, several inputs helped to capture the essence of the vision that was meant to accompany the forum. Unfortunately, those materials cannot be reproduced here. Given the large number of individual submissions and presentations, it goes without saying, that only a small sampling of the inputs can be drawn upon to provide a compass for the overall achievements of the forum.

Some of the highlights are offered below - in **blue** and *italics*, and without naming names.

Some participants described their innovative uses of visual aids to teach critical and analytical thinking skills:

If I were to develop a critical thinking and evaluation grid, the first criterion I would put down would be purpose, i.e..... show a clear understanding of the assignment's purpose, which means I would need to be clear about the aim and the learning outcomes of the assignment.....Also, I try to use graphic organizers when possible, as visual aids become even more important in DE classes because of the lack of synchronized feedback."

The above is seconded as follows:

I love graphic organizers! They are a real life saver in DE. In courses like telecommunications, database design, etc. I try to encourage students to use graphic organizers to help them understand new technical terms, showing what categories the term fits into, what terms are similar, what might be examples of the term, etc. I've also found graphic organizers an excellent tool to bridge the gap from "a bunch of ideas on a topic" to the beginnings of an outline for a paper. Of course, I'm a hopelessly visual thinker.

The well-known problem establishing that not all students might be ready or ripe for the skills needed to sustain critical and analytic thinking is channeled to lead to questions about the political meaning of the (Bushite) concept of "no child left behind" - as quoted below:

"Amid calls for greater accountability in higher education, ETS is helping the postsecondary community examine, define and evaluate strategies for creating an evidence-based assessment system for student learning."

To this, a colleague responds:

I first heard this phrase ("no child left behind") in teaching for Maryland when I gave a graduate student an F in a computing class. Since we are teaching adults, how does this apply to us?

Some sentiments brought to bear on the need for focus and relevancy, especially on the part of online students, were as follows:

They end up answering the questions they would like me to ask rather than the questions I did ask.

DE absolutely requires BOTH the ABILITY to read the text, instructor-posted notes, and the conference responses, AND the commitment actually to DO the reading. This is where we need to start when addressing critical thinking. They can't possibly think about material they cannot or have not read.

In some cases, it is obvious that the student has not even read the textbook or the notes posted in the classroom, or in the case of a F2F class, the discussion that has taken place on the topic.

To address this rampant problem, colleagues propose the following methods:

Providing clear instructions helps students to perform the task successfully. One idea is to post student models or examples of assignments that contain the required elements of the assignment.

If I do not think that a student has put in the required effort to come up with a constructive argument, I make it clear and ask the student to substantiate the answer with more theory, evidence and examples...

Since jumping into the online venue only, the challenge, rather, is to frame the question within a box, to prevent outside the box thinking. By outlining specifically what the objectives are to be and then allowing the student to answer within the box, it prevents a major problem of wandering off into the woods or half way around the city.

To this, I added a nod by way of this brief interjection:

I also see a great deal of merit in the point here! In fact "wandering off into the woods or half way around the city" may also be the case, when students are sent off looking for additional course information from the web when they don't even know the contents of their own (bought) textbook yet...

Before signing off on the first Main Topic of AGENDA 01 titled "Understanding and Relevancy", I suggested the following summary as an example to aid faculty in their marking and grading procedures:-

Issues to address to the entire class, or else to targeted students who have defaulted on expectations:

- 1. You have not addressed the question as asked (provide a brief reason, or re-quote your original question - to demonstrate what you mean).*
- 2. The information you have supplied is not relevant to the demands of the question asked (provide a brief reason); in other words: instead of dealing with X, you focused in error on Y.*
- 3. You have tried to answer the question from your own point of view in total disregard of what the question actually asked for: can you cite any things from the textbook or the class materials to convincingly support what you have submitted? (of course, the student cannot!)*
- 4. You made an effort to address the question as best as you could; however, you dealt with issues which the question didn't ask for (cite an example from the student's own work to support your comment here).*

Under AGENDA 02, someone seized on the problem of mindless information retrieval (ie. simple cut-and-paste) to provide a possible remedy:

On *"cut-and-paste --- when technology doesn't help"*:

The method which I use to avoid the "cut and paste" without thinking tendency of some students is to forbid any use of quotations in papers submitted. Rather,

only paraphrasing of the material is permitted while requiring citation of all the "thoughts" (not just words) of the author.

This has been rather effective in stimulating students to analyze the material which is being used in that they need to understand it in order to paraphrase the material in their own words.

Under the second Main Topic of AGENDA 02 titled: Detecting Connections between Ideas, the discussion table featured this question:

- Does the student connect the sources of data and information to indicate the relationship between causes and effects?

The following dialog ensued between two participants:

I teach BMGT 495 (Strategic Management) regularly and ask students to complete an audit of a major corporation by providing answers to a questionnaire I provide. The first part of the audit is data-gathering and the last part, analysis. It has been a struggle to cause the students to make the connections.

Response: Do you give them an example of a finished deliverable? Or would this ruin the creativity/originality? Maybe a simple "what was hard about this assignment" question in the following week?

On AGENDA 02, Main Topic 4: Supporting Data and Effectiveness of Conclusions, we are informed thus:

The first paper I receive from a student often has supporting data in the nature of "I think", "I feel", etc. Many students improve presenting well-reasoned arguments with stronger supporting data as the semester advances.

My personal observation is that this is a good point to note. Under normal circumstances, it offers a clear indication that determined students - in spite of all the hurdles - manage to progress in the direction of fulfilling course objectives towards the end of the semester!

Objective understanding is essential to an understanding of one's subjective view. For this reason, some assignments foster critical thinking by requiring the student to critique subjective views of writers from non-academic journal articles. Another process of achieving critical thinking is to provide a forum for students to critique other students' subjective responses following an objective view.

On AGENDA03, Main Topic 1: Accepting Alternative Approaches and Techniques, we are informed thus:

*To teach critical thinking I think we need to help students learn how to ask good questions **once they have the tools to find answers to questions** that have been presented to them.*

Given the variety of skill levels and the limitations of DE re: immediate responses to questions for clarification -- well designed assignments, ability to use the library databases effectively, "tools" (analytical techniques), explanations, examples, etc. all work together to encourage critical thinking.

On AGENDA03, Main Topic 2: Using Sound Techniques to Maximize Learning, these two opinions - among many others - were put forward:

There are many types of students. You have the student who "recognizes the qualitative distinction between his/her work and that of a fellow student who scored higher marks" but they want an A anyway. The only concerns of over 50 per cent of my students are to pass the class, graduate and get a degree at any price.

The most effective strategy I've found for helping students take a part and solve a word problem comes from good ole high school geometry "proofs". I require the students to list all "given" elements (with units), specifically list the "to find" element (with units), and list all "relationships" (e.g. formulas). First, this approach unfreezes their minds and gets them into the problem. Second, regardless of student reading skills this approach forces an intelligent dissection of the information presented. Most students can now plug and grind to get an answer, but some have to be guided to take an extra step of drawing arrows from the "given" lists to the corresponding variables in the formulas. Pathetic that it's needed at the college level, but it does work to an amazing degree if the approach is rigorously required in homework and on exams.

In some f2f classes I have used brain teasers written on the board before class and sometimes discussed during breaks as a way to introduce the idea that their own brains can do amazing things. I'm not sure how effective this is, but it's fun

and a good icebreaker for courses that some students might approach with trepidation.

AGENDA 04 as the last conference was devoted to issues, uses, abuses and misuses of language. This is because language is the only *currency* that is potentially liquid enough to serve as a regulatory mechanism to ensure the efficient deployment of critical and analytic reasoning. Pun absolutely intended! It is standard belief that good writing habits and analytical thinking reinforce each other. The first Main Topic carried the following title: **In Lingua Veritas: Clarity of Presentation**. Here, some responding colleagues shared the following thoughts:

The more we can engage students, the more we could inspire them. It would be important to allow/encourage students to ask instructors/professors questions about written assignments.

These questions could include:

If I write a draft early, could I share it with you so that you can tell me if I am going in the right direction?

...just making marks and other comments may not get at the deeper problem, which can usually be better handled in F2F classes, as you point out; I often let the class discuss the possible causes before I go into them, but with classes getting larger online, this becomes a real problem.

In concluding, an overall synthesis of the collective submissions covering all conferences could yield a consensus centered upon the following:

- Course materials in all disciplines need to provide some sort of road-map for students to develop their critical and analytical thinking skills.
- Grading procedures should incorporate appropriate critiques and comments that direct students to what to do and what to avoid, in order to meet the demands of critical and analytical thinking.

Among the measures discussed was also the need to beware of the distractive potential of flooding the WebTycho classroom with too much digital material. Although they may be all academically useful, they can add an undesirable burden to the contents of the textbook and overwhelm some students.

It is to be hoped that our collective efforts invested in this useful forum would inspire future sequels. A review of the evaluative summary of those who submitted final thoughts to endorse their gains confirms that the forum was able to enhance the development of individual delivery in teaching critical and analytical thinking skills.

Two colleagues summarized their experiences with the forum this way:

"The questions and introductory comments have been provocative. The many responses indicated that you have engaged our attention and provoked responses. My gratitude also to the many instructors who have taken part. I have read your observations and opinions. The workshop has allowed me to "meet" colleagues whom I have never seen. We share many of the same problems and goals, and I wish you all success in your pursuit of teaching critical and analytical thinking."

"I have picked up several excellent ideas for use in my teaching and appreciate very much the opportunity to participate in this forum!"

END

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