The Critical-Analytical Vocabulary as a Common Academic Language[1]

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Preface

Richard Paul, founder and director of research for the Foundation for Critical Thinking, once told me a story about a short flight he took in a private aircraft that contained only himself and the pilot. This pilot also happened to be a biology teacher at the University of Minnesota, a subject Paul knew little about. Paul, being inquisitive, began questioning the pilot on the nature of biology. He began using the tools of critical thinking to probe the foundations of the field, asking questions like 'what is the purpose of biology?' 'what are some of the main assumptions biologists make?' 'what are some key questions biologists routinely consider?' 'what kinds of information do biologists pursue, and how do they determine its quality?' 'what are the most fundamental concepts necessary for understanding biological thought?' 'how do biologists tend to view the world?' 'what are some inferences biologists make as a result of this viewpoint?' After about 30 minutes in which Paul continually questioned the pilot Socratically (by following the implications of each answer given), the pilot stopped the process. He said 'you know, what's really interesting about the questions you're asking is that some of them would be answered in the first day of an introductory biology course, and some of them could be the focus of PhD dissertations'.

This is an example of highly effective intellectual communication. By questioning in a disciplined manner, using a small set of universal analytical tools, Paul had begun to enter into the logic, the system, of biology. In just twenty minutes, he was beginning to ask questions like a biologist, to think like a biologist.

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1 This article was written for an edited work recently released in paperback: ***Critical Thinking and Higher Order Thinking: A Current Perspective***
Editor: Michael F. Shaughnessy (Eastern New Mexico University, Portales, New Mexico)
Hardcover: https://www.novapublishers.com/catalog/product_info.php?products_id=28202
Softcover: https://www.novapublishers.com/catalog/product_info.php?products_id=47242
E-book: https://www.novapublishers.com/catalog/product_info.php?products_id=28377

This essay explores the idea of intellectual communication and its improvement through the development of a shared academic language based on these and other universal analytical and evaluative concepts.

Intellectual Communications and Miscommunications

Intellectual communications abound in academia. Researchers must communicate the status of their work at numerous stages: during initial grant applications, when obtaining permission or access, within publications and to reviewers, in presentations to other academics or to the public. Teaching involves communicating to students through syllabi and assignment descriptions, during class and in office hours or tutorials; and again to administrators, department heads, or deans regarding publications as well as teaching successes and struggles, progress and development. Students, for their part, must communicate to professors their puzzlement and confusions during class time and after, as well as the extent of their understanding during exams and tests.

Yet many of these communications are not successfully received and understood by their intended audience, leading to much wasted time and energy. For instance, students are often confused about what is being asked of them. Indeed, recent broad-scale studies (see e.g., Casner-Lotto and Benner, 2006; and especially Arum and Roksa, 2011) support prominent scholars (see e.g., Bloom, 1988; Bok, 2006; Ramsden, 2007) who have long argued that many students complete their undergraduate degree without learning much at all, and with very little development of their critical capacities. Taken as an aggregate of professor and student time across the nation (or world, if you like), this represents hundreds of thousands of hours of 'wasted' time each year.

And, of course, misunderstanding is not exclusive to students. The overwhelming majority of teachers find it hard to identify objective standards for assessing thought (Paul, Elder, and Bartell, 1997; Thomas, 1999) and to communicate them to their students (for review, see Black and William, 1998, and; James et al., 2006). One implication of this is that much evaluation of students' written work is grounded in highly subjective and personal criteria, such as the degree of 'flair and sparkle' (see, e.g. Paul, 1995).

Analysis and Evaluation: Fundamental to Successful Communication

Successful communication depends upon effective analysis and evaluation of thought. That is, in every case in which humans are confronted with something requiring intellectual processing (an essay, a lecture, an assignment, a research publication, etc.), they must break it down to focus on individual parts (analysis) and then they must determine the extent to which those parts make sense or have validity (evaluation).

This can be seen clearly when applied to written work: there is no way to take in an entire book or a page or a paragraph all at once. Operating simultaneously during analysis is the process of evaluation: once readers have determined the meaning behind a section they've focused on, they then begin to judge the extent to which that meaning is valuable or true. As you critically read this chapter, you are doing these precise things – analyzing what you are reading and assessing it for quality, taking it apart to understand it, deciding what to accept and what to reject, relating the ideas within it to other ideas you already have about education and learning, and so on.

Of course, there are many forms of analysis and evaluation. I've just discussed one: argument analysis. We might also analyze and evaluate this essay grammatically: noting some interesting uses of punctuation and a bizarre combination of British and American spelling. Or perhaps from a gender studies perspective: noting an absence of gendered pronouns in examples being used.

Subject Specific Forms of Analysis and Evaluation

In fact, there are myriad forms of analysis and evaluation. Each discipline has at least one, and many have more. These subject specific forms are often highly specialized and unique: biologists are interested in the extent to which an experiment has been controlled and can be repeated; historians are not. Art critics focus on brush stroke and use of color; psychologists don't. Basketball coaches care about wrist flick and arm extension. Poets think about word choice and rhyme structure. Anthropologists are concerned with interpretation bias.

Though this is not often made explicit, much of our success or failure within academia is due to our ability or inability to become conversant in these scholarly languages and dialects, and thus to communicate in appropriate ways to colleagues, mentors, and students. In other words, people are considered skilled in a subject, not usually by measuring the number of 'facts' they

can regurgitate (though this often forms the basis of low-level assessment) but by the extent to which they can read and interpret (i.e. analyze and evaluate) texts or other intellectual communications in the field, and then produce unique and creative syntheses which are clear, accurate, and logical (among other important criteria); conditions which are tested at higher levels of examination, such as PhD dissertations.

Subject specific forms of analysis and evaluation are important and useful. They represent systems which serve to ensure (or at least improve) quality of thought within the discipline. They have developed slowly over time, often in response to previous abuses which were recognized as problematic (e.g. the creation of ethical guidelines in medical research due to unethical actions taken by researchers), or to correct common mistakes in the field (e.g. not controlling for variables in the sciences and social sciences).

However, subject-specific forms of analysis and evaluation are also limited in important ways: because each is unique, it is not transferrable to other fields or disciplines; because each is complex, often requiring the absorption of a large vocabulary, students must spend many weeks or years reading and working in a particular field before they develop skill enough to contribute to its discourse, and most will never attain nor are interested in attaining such a level[2]. Further, these specialized languages necessarily exclude those who do not speak them.

This exclusion tends to increase as one gets closer to primary research; much of what is published is readable by only a small fraction of humanity, which renders impotent many important insights and implications for human action and societal development (for instance, how many fundamental and fairly simple yet powerful ideas have you studied which are not widely understood or employed, with negative implications for individuals or society?) These important insights are not successfully communicated to students and the public because they require knowledge and skill in specific forms of analysis and evaluation, which many readers lack.

Fortunately, underneath these specialized forms of discourse, and fundamental to effective functioning within any discipline, lies a universal set of analytical and evaluative

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That is, most students of most classes will not become professionals in that particular field.

concepts; a set which is sometimes called the 'critical-analytical vocabulary'. This vocabulary, being based in common language (e.g. English, French, Japanese, Arabic), is accessible to all. In other words, it forms the basis of a vocabulary that can be shared by all people in human societies; it can be developed and expanded in an effort to improve the efficiency and success of intellectual communications wherever they exist.

The next two sections briefly explore some of these analytical and evaluative tools, and the manner in which they implicitly operate in human thinking, wherever and whenever humans think.

Universal Analytical Language

I will now make an assertion which may seem controversial, but bear with me for a moment: despite the unlimited potential manifestations of human thinking, there are universal elements of thought which are always present, and which are therefore always subject to inquiry. Further, if one understands that disciplines do not exist as bodies of collected facts but as forms of thinking about the world in specific directions, one will see that each subject can be probed at a fundamental and powerful level through its *system of thought*.

Think back to the story which begins this essay. How was Paul able to enter into a subject about which he knew very little in such a short time? The answer lies in his understanding of human thinking and therefore human thinking regarding specific subjects: he knew that certain structures form the basis of every discipline, and so knew he had a ready set of analytical questions with which he could investigate this new (to him) system of thought (biology).

Paul and Elder call these fundamental structures the 'Elements of Thought', and generally place them into a circle diagram to emphasize the non-linear nature of the relationships between and among them. These structures are not proceduralized, but are based on principles which can be ordered in many possible ways for many possible purposes. To my mind, they form a starting point for the development of a universal analytical language:

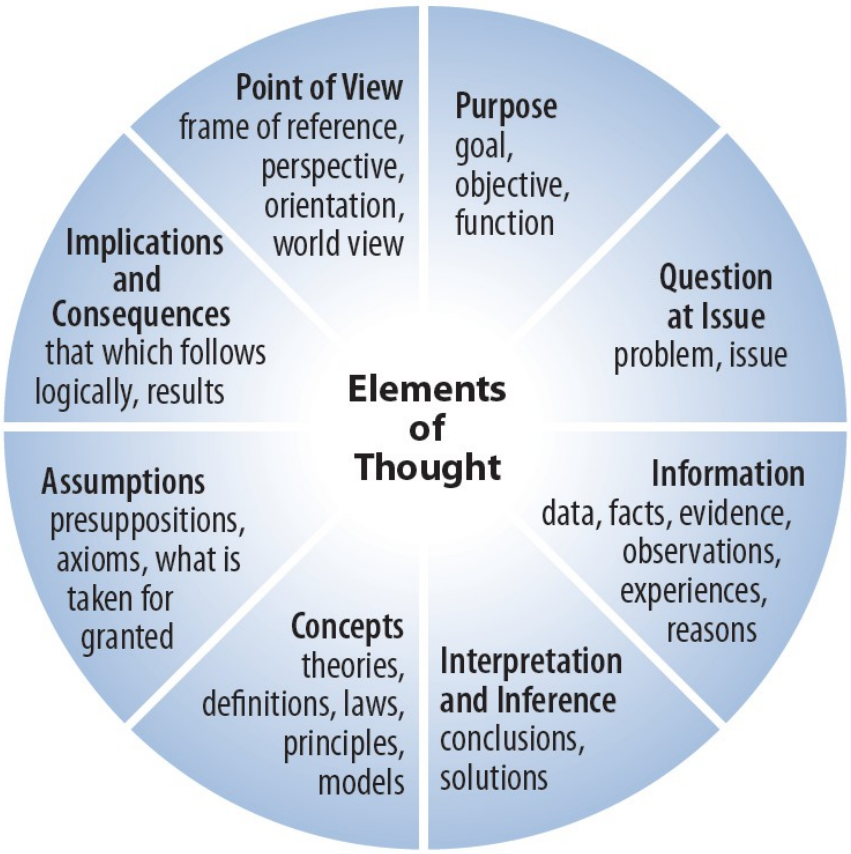

Diagram 1: *Elements of Thought*; used by permission, Foundation for Critical Thinking

Paul and Elder argue that the elements of thought are present wherever human thinking is present, and therefore suggest a minimal set of questions which could be asked while performing any intellectual analysis. One can, for example, question the *purpose* of studying history or of car buying. One might seek out *information* for preparing for a nursing exam as well as for making a political decision. There are *implications* for being a highly skilled teacher just as there are for being a loving and supportive parent. Furthermore, these elements interact in the mind in an integrated way. If your *purpose* changes (teaching elementary students versus teaching college students), then so too will your *questions*, and therefore the *information* you seek, the conclusions you come to or the *inferences* you make, etc.

Another way to consider the universality of these structures can be seen in the absurdity of their negation; that is, it would be unintelligible to say of one's own reasoning that it is without a *purpose*, asks no *questions*, is based on no *information*, leads to no *implications*, embodies no *point of view*, begins with no *assumptions*, employs no *concepts*, and comes to no *conclusions*. Further, to claim that these structures are not universal is a conclusion (*inference*)

which is based on some *information* and in response to a *problem*; it employs *concepts* filtered through the lens of particular *assumptions* contained within a *point of view*; it seeks to accomplish a goal (*purpose*) and leads to *implications* and consequences. In other words, to negate them is to use or presuppose them - and thus to prove that they are implicit in reasoning.

In an academic subject, these elements can be applied on multiple levels. To introduce students to a subject, for example, one might begin with a discussion of the elements of reasoning at the heart of the subject, as in: some important purposes of engineering are… some key questions engineers ask are… engineers tend to gather the following types of information… engineers make the following types of inferences… engineering is founded on certain assumptions regarding the nature of the world, such as… some key concepts central to engineering, without which one would not be able to understand it are… some implications of skilled engineering reasoning versus unskilled engineering reasoning might be… engineers tend to view the world as follows…One might substitute any subject or human activity for "engineering" above (e.g. history, anthropology, teaching a course, teaching an individual class, reading an essay or speech, etc. etc.) and these analytical tools will, I believe, prove valid and useful.

Of course, these are not the only possible universal analytical concepts. One theoretician, Gerald Nosich (2009), has proposed a ninth: context. He presents all nine together by putting a box around the circle of elements, with the word 'context' in the corners, implying that human thinking always exists within a particular context. There are possibly more structures which are universal in their application, and as the field of critical thinking continues to emerge it will be important for more scholars to contribute their own ideas and suggestions regarding universal as well as subject specific forms of analysis and evaluation. Linda Elder makes such an appeal in her contribution to this collection.

Universal Evaluative Language

In addition to these analytical tools lies a group of fundamental intellectual standards which are essential, to varying degrees, in every discipline. Paul and Elder (2002) offer the following list of what they term "essential intellectual standards."

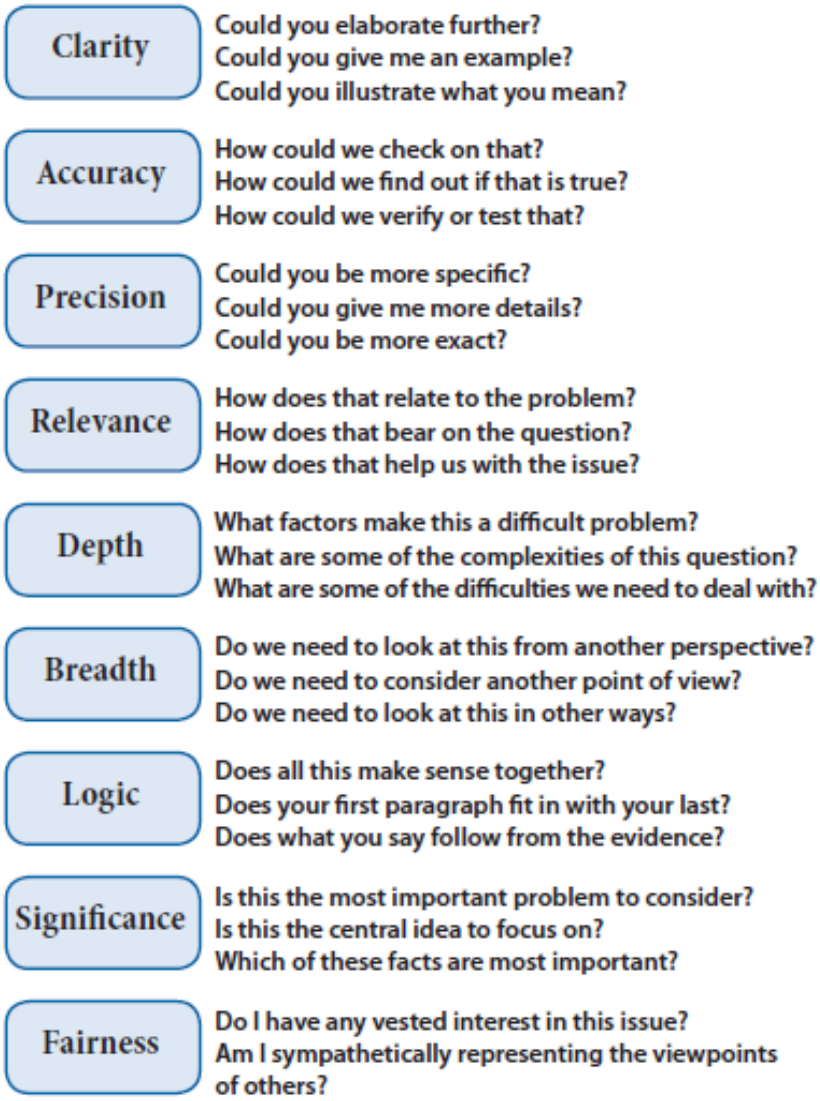

Diagram 2: Universal Intellectual Standards; used by permission, Foundation for Critical Thinking

One can easily see the usefulness of this list to teaching and learning, and indeed to thinking generally. But Elder and Paul point out that the above is far from complete, and have explored and developed a more extensive, but still not exhaustive, conception of intellectual standards in the *Thinkers' Guide to Intellectual Standards* (2009). For example, one can readily see the importance of intellectual standards such as sufficiency, validity, reasonability, consistency and so on.

People skilled in adhering to intellectual standards can determine the quality of intellectual communications by asking the following types of questions, contextualized, for example, when reading an article: "To what extent are the central parts of this argument clear; to what extent are they muddy or vague (clarity)?" "How accurate is the information used in this

report (accuracy)?" "Is there an adequate amount of detail in examples used(precision)?" "Does the author deal with the complexities in the issue, or is the issue treated superficially (depth)?" "Has the author considered alternative viewpoints, or given an overly narrow account (breadth)?" "To what extent is this specific example pertinent to the argument (relevance)?" "How important is this issue (significance)?" "Is the argument coherent, or does it have internal inconsistencies (logic)?" "to what extent is the author using manipulative language or other intellectual trickery to convince the reader that the argument is sound (fairness)?"

Of course, the standards require some degree of interpretation during contextualization. That is, accuracy in a biology experiment is not the same as accuracy in interpreting an essay. The same goes for depth: one might consider multiple societal forces and their effects on a particular event in the study of history or one might look for multiple variables leading to mental illness when reasoning psychologically. In some cases it may seem that one or more standard is not relevant to a discipline at all (e.g. 'breadth' in architecture); however, in my experience this is usually resolved upon deeper reflection[3] (e.g. 'have you considered the viewpoints of those who will be living or working in the building? Of the builders? Of the neighbors?).

As with the elements of reasoning, arguments against the importance of intellectual standards in human thought are implicitly based on those very criteria. For instance, they imply at minimum that the argument is *clear* and *accurate*. Further, can you imagine a professor or professional saying "what we want in our field is people who routinely think unclearly, inaccurately, imprecisely, superficially, without regard to complexity, narrow-mindedly, illogically, and unfairly"?

Analytical and Evaluative Fluency

This analytical and evaluative language is intuitive (few would argue against the importance of their usage). Yet how fluent are we in its use or in the use of any analytic and evaluative language? Extant research is not inspiring. For example, in the studies conducted by Paul, Elder, and Bartell (1997) and Thomas (1999), only 8% of professors interviewed were able

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3 This statement is not meant to be all-encompassing.

to enumerate any intellectual criteria required of students[4], and over 90% of faculty could not distinguish between an inference and an assumption, or between an inference and an implication. It may come as no surprise, then, that the new and highly visible report *Academically Adrift* (Arum and Roksa, 2011), finds that students' ability to effectively analyze and evaluate is generally poor, and that these skills do not increase much during their college years (during which 45% of students demonstrate no statistically significant gains in critical thinking).

Thus, teachers' good intentions are often not successfully communicated to students. Let us look at some brief excerpts from research I conducted at the University of Oxford which demonstrate this miscommunication between teachers and students (Cosgrove, 2011; 351):

> RC: and when you have your students critique the other arguments, what kinds of criteria do you see them using?
>
> Tutor B: Well I think that's much more ad hoc. They tend to assess in terms of what they agreed and disagreed with. That's probably less helpful…it tends to be more sort of, "well you know I agree with x. y, z, but I disagree with a, b, c"…
>
> RC: So you don't actually say "ok when you're critiquing this person, you need to use these criteria"?
>
> Tutor B: No but I think I should do [pause] just thinking about it [pause] now you ask it, I probably should say "look, you know, what do you think are the criteria that I use? You should use the same sorts of things"…but obviously your implicit point is right in that they should do it with criteria.

Accordingly, undergraduate responses to the question of what criteria they use in intellectual evaluation exhibited considerable confusion and anxiety:

> Student G: I find it really hard to read someone's essay and critique it. I don't know why, it's like impossible – it's like gibberish I don't know why!... But in the end I just kind of [go] through the plan of [an] essay and then just

4 The Paul et. al. (1997) study was randomized and included 120 faculty drawn from 28 public and 29 private colleges and universities across California, encompassing prestigious universities such as Stanford, Cal Tech, USC, UCLA, UC Berkeley, and the California State University System. The Thomas study repeated this protocol with secondary teachers in a San Diego school district with, in the author's own words, 'virtually identical results'.

> underneath in a different color pen, just say like whether I think this is a good or bad idea, but I think that's a bit sort of childish.
>
> Student F: yeah well you often just get a - it sounds really like stupid but it's almost just sort of what you think sounds right. It's almost like an impulse. It's almost an impulse decision. It's just what seems more convincing…

We can see here frustration on both sides: by the tutor for lack of critical thinking from students, and by students for not knowing how to engage in critical thinking; and all for lack of an explicit understanding of the tools of analysis and evaluation.

Finally, even much research activity (even by PhD's; even graduates of the world's most respected institutions) suffers from improper or poorly conducted analysis and evaluation; thus the need for extensive peer review and the rejection of much submitted work.

Recap

In sum, my argument is that effective intellectual pursuit requires effective communication, which in turn depends upon effective engagement in analysis and evaluation. Further, though forms of analysis and evaluation differ from subject to subject, there are universal forms which are fundamental to all disciplines; and that the groundwork for this 'critical-analytical vocabulary', or shared academic language, has been established by Paul and Elder in the intellectual constructs termed the 'Elements of Thought' and the 'Universal Intellectual Standards'. Finally, despite our good intentions, we humans are not, with few exceptions, fluent or disciplined in the language of analysis and evaluation, universal or otherwise.

Immediately following is an exploration of some possibilities which explicit adoption of a common academic language might create.

What would adoption of a common academic language look like in an ideal world?

Let us now consider a hypothetical university in which virtually all students and faculty are fluent in a universal analytical and evaluative language, focusing for the moment on important implications for teaching and learning. In this imaginary institution the logic of each course is identified from the very beginning in the syllabus: its purposes and key questions, core concepts and main sources of information, important assumptions and implications, as well as the central perspective (or perspectives) which will be explored or developed. Students, being sensitive to the elements of thought, are readily able to read and digest the basic logic of the course, even if they have never before studied the subject (as Paul did with biology, using the

elements of thought). Students come to class with questions about these fundamental structures – how are they different from or similar to those within subjects and fields which they already understand? What unique structures will be considered during the course?

Teachers are ready to respond to these questions and are comfortable helping students make connections with other disciplines, since their own fluency in this common academic language has allowed them to probe the structures of surrounding as well as distant fields of understanding (again, as Paul did). Further, they make clear their intentions with the course: the grounds upon which students will be evaluated; the skills and dispositions they will be expected to exhibit or develop. Students understand these communications, as they are accustomed to discussing analysis and evaluation and possess well-developed vocabularies for both; they are knowledgeable about these processes generally, as well as experienced in their engagement in multiple forms.

Consequently, the quality of student papers and student thinking is generally high. Though differences certainly still exist, few student papers contain wildly irrelevant or flagrantly inaccurate statements. Students are cognizant of what to look for in their own writing and, by the time they graduate, have years of experience of explicit and informed self-reflection (itself entailing analysis and evaluation). Due to this experience, these students take constructive critique well, and understand that their writing and reasoning can always improve.

Students graduate with fundamental and long-term understandings of the basic logic of various disciplines. They are explicitly aware of both universal as well as subject specific forms of analysis and evaluation, and they are ready to apply these to further study or in work settings; finally, students are flexible and experienced in learning new systems, so they can more readily enter into whatever novel and/or unique forms of analysis and evaluation they encounter throughout their professional and personal lives.

What does this look like in reality?

The above ideal may never be achieved, certainly not in the near-future. However, schools and universities across the United States and beyond are beginning to take critical thinking more seriously, and are working to integrate its analytical and evaluative language into their courses and curricula. One such institution is currently attempting to infuse the ‘elements of thought’ and ‘universal intellectual standards’ across the curriculum. Some faculty are attesting to powerful change, and to the benefits of a shared academic vocabulary. For example, consider

this highly reflective and self-aware comment from one professor after being introduced to the elements and standards and using them in her classroom:

> "I think that for decades I have given my students many opportunities to engage in critical thinking, and I have modeled critical thinking in class discussions. But I don't think I can claim ever to have *taught* critical thinking in a systematic way. [The Elements of Thought and Intellectual Standards] give me a way to share a critical thinking vocabulary with students and to chart their progress. I know and can tell my students exactly what I am looking for."- *Spring 2008 Pilot Program Participant, Department of English*

The first sentence represents the thoughts of the vast majority of teachers, 97% of whom claim critical thinking to be of primary importance and who further claim to be developing it in their students (Gardiner, 1995; Paul, Elder, and Bartell, 1997; Thomas, 1999). Of course, most teachers believe they are teaching for critical thinking and most probably are providing some *opportunity* for students to think critically; however, because the overwhelming majority of faculty (roughly 80%) are not fluent in the language of analysis and evaluation, and so do not discuss analytical and evaluative concepts explicitly with their students, most of this opportunity is wasted, the time instead filled with uncritical discussion and reaction.

After being introduced to the 'elements' and 'standards', this professor began to integrate them into her course in a systematic way. On the next page is an example of how she used this language to communicate with her students more explicitly and clearly regarding the analysis and evaluation of historical texts. Notice that she has added one subject-specific analytical concept: 'techniques'.

Course: English 301

Analyzing Historical Texts

To analyze means to break something down into its component parts. University-level reading should be analytical reading, and the following questions will help you identify the most important parts, or aspects, of the texts we are reading this semester. You can prepare for class discussions and improve your analytical reading skills by reading the assigned texts with these questions in mind and trying to answer them.

Questions: What questions is the writer weighing in on? Of the cultural issues of the time, which appear in this text? (For example, the heroic ideal looms large in Beowulf.)

Information or Evidence: Where in the text are these cultural issues addressed? Which lines or paragraphs on which page?

Inferences/Conclusions: Overall, how would you summarize the take on these issues in this text? (For example, is Beowulf positive or negative about the heroic ideal, or a bit of both?)

Concepts: What cultural ideals or beliefs stand behind the behavioral norms in this text?

(For example, what besides the heroic ideal in Beowulf creates the ethical standards?)

Assumptions: What does the writer of the text appear to take for granted about the enduring human questions (e.g., the nature of the world, the purpose of human life, the way society is organized, what constitutes justice)? What does the writer assume that we would not assume in the twenty-first century?

Consequences: What are the consequences of acting in accordance with the ideals expressed in the text? What conflicts are created with other ideals of the culture or even with other ideals in the same text? If the text "solves" one problem, does it create another?

Point of View: How is this text a product of its historical moment? How does this text shape its historical moment? For what part of its society does the text speak? (For example, do the ideals it represents apply to all members of the society or are they different for different classes or for men and women?)

Techniques: What writerly techniques make the text effective? For example, how are the characters made interesting to us? What kind of imagery is used? Is there a metrical or stanzaic pattern?

Evaluating Arguments

To evaluate the arguments we read and those you will be making, we will adapt the "Standards of Reasoning" from *The Miniature Guide to Critical Thinking: Concepts and Tools*, by Richard Paul and Linda Elder (Berkeley: The Foundation for Critical Thinking, 2006):

CLARITY: Could you give an illustration? Could you give an example? Are there enough transitions to indicate how the parts of your paper follow one from another? Have you communicated why your claim is important?

ACCURACY: Does your thesis hold if you consider the whole range of texts? Does it hold if you consider the internal contradictions within texts? Have you written a refutation to deal with any counter-evidence your audience might cite?

PRECISION: Does your thesis require qualification in order to be completely accurate? (For example, does what you say about the sonneteers hold for all the sonneteers or only for some of them? Is what you are saying true of all social groups or just some?)

RELEVANCE: Does your thesis bear on the central issue of the course (i.e., the nature of the transition from Medieval to Early Modern)? If you are giving reasons, are you including the most important reasons, the most powerful explanations?

There is some indication that explicitly communicating this language to students can lead to improved student reasoning. For example, contrast the student responses from Oxford undergraduates regarding evaluation with this response from a student four years their junior, but who has been introduced explicitly to the intellectual standards (Cosgrove, 2010):

> RC: so as you can see from the stuff that you've read, what I'm focused on is critical thinking – has your teacher talked to you about critical thinking?
>
> (Students laughing, lots of "yeahs")
>
> Student: yeah he loves his critical thinking. The concepts are wide right. Like "breadth, how wide does the argument go? Depth, how deep does it go? Specific, precision, accuracy" all of that, all the time. (laughing)
>
> RC: so what does he have you do with these ideas?
>
> Student: just so when you write, and also when you read. So when you read a source "how deep does this go? Is this just skimming the surface or is it a deep in-depth opinion?" when you write "are you just writing briefly or are you writing deep points?" and accuracy is something, on exams you need to be accurate, so that's a good thing. Other ones, such as breadth, so how wide do you cover, do you look at different points of view? Or are you being quite limited in your thinking and the way your arguing? So he's always saying like "don't forget!" he loves them, he loves them! (laughing)

This response is far more elaborate and precise than any response from the Oxford undergraduates, as well as 90% of the teachers interviewed by Paul, Elder, and Bartell (1997) and Thomas (1999). Of course, it is imperfect, and we have no evidence that this student uses these ideas effectively when reading or writing. However, he has become explicitly aware of some fundamental and powerful evaluative language and seems to be interested and engaged with the ideas. Further, he is at minimum aware of their potential use, and so is better positioned to employ them in his thinking.

These are but a few of the ways in which the Elements of Thought and Universal Intellectual Standards are currently being used to improve intellectual communications between teachers and students.. For example, some resources can be found in the handbooks provided by the Foundation for Critical Thinking, which contain dozens of sample course designs and assignments from every major subject for k-12 education (see, e.g. Paul et al., 2008). Further

guidance can be found in Gerald Nosich's (2009) *Learning to Think Things Through: A Guide to Critical Thinking Across the Curriculum.*

Some Implications for Research

Of course there are broader implications beyond teaching and learning of a shared academic language. One important direction is that of interdisciplinary research. Currently, much research is confined within a specialized area, and there are relatively few examples of cross-disciplinary research; yet such investigations often produce the most groundbreaking advancements. Further, as world problems are increasingly recognized to be multi-dimensional, researchers are finding it necessary to take a multi-disciplinary approach; an approach which includes team members from different backgrounds who possess varied knowledge and skill sets. One such example is climate change research, which necessitates integrating insights from such disparate disciplines as ecology, chemistry, climatology, biology, meteorology, and physics. Another example is that of drug rehabilitation, which again requires insights from psychology, history, neuroscience, and sociology.

If effective research is to be done regarding climate change or drug rehabilitation, must individuals then become experts in all these fields? Even if we had the inclination and potential, the time required makes this highly impractical. Yet the critical-analytical vocabulary offers the possibility for experts to communicate complex ideas in a universal language which is understood by all members of a research team. Such communication could, would, and should, be done creatively; yet a simple way to start would be to produce the 'logic' (again, which includes all the elements of thought) of a given aspect of the project to all participating researchers. Thus, each would be able to grasp the basic ideas and findings fairly quickly, and could then integrate them into their own specialized thinking and planning.

A similar approach (using the elements of thought to structure a summary of research) could be taken in the presentation of findings to the public: by using common language which is more accessible, researchers might better bridge the gap that often separates academic research from public understanding, acceptance, and implementation.

Summary and Conclusion

To summarize: if we look at the academic world as intense with intellectual communications, we see that much is lost in translation between people skilled in different forms

of analysis and evaluation. Some of this difference is necessary and helpful; however much of it is counterproductive. I see in the critical-analytical vocabulary of the English language[5] the potential for an academic *lingua Franca* which could significantly improve communications between teachers, students, researchers, and the public. This article has laid out some of these possibilities.

What, then, are some important implications of this argument? The first is that we need to think and talk about analytical and evaluative language more explicitly in general. Every field should discuss and consider the important forms of analysis and evaluation central to that discipline, and these should be communicated to students clearly and routinely. Indeed, the 'Assessment for Learning' and 'Learning how to Learn' (Black and William, 1998; James et al., 2006) projects encouraged faculty to do just this and achieved significant learning improvements as a result.

More immediately, and perhaps more easily, individuals and communities should increase their fluency in the universal language of analysis and evaluation. If we are to communicate effectively with each other, if we are to understand thoughts and ideas that are presently beyond us, we must improve our ability to analyze and evaluate those communications. The 'elements of thought' and 'universal intellectual standards' provide us with resilient tools to improve our efforts in this direction. If this vocabulary seems to you intuitive, begin to experiment with it more explicitly in your intellectual communications. Then, finally, after a rich diversity of applications of these elements and standards to a range of intellectual systems, judge for yourself whether they contribute to the power and enrichment of your students' (and your own) intellectual work.

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The English language concepts and principles can be constructed in parallel forms in all natural languages. The works of the Foundation for Critical Thinking, for example, have been translated into 11 languages so far: Spanish, Dutch, Arabic, Chinese, Japanese, Korean, French, Greek, Polish, Thai, and Turkish.

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