

# Cognitive tools that come along with theoretic thinking

## Summary

Cognitive tools	are aids to thinking developed in human cultural history and learnable by people today to enlarge their powers to think and understand.
Theoretic thinking	is a product of the set of cognitive tools available to us as we develop theoretic abstractions; these cognitive tools do not develop automatically but result from students learning to repeat within themselves the achievements of theoretic thinking in our cultural history.
Imagination	The ability to think of things as possible--the source of flexibility and originality in human thinking. The theoretic imagination is enhanced by the array of discoveries and inventions made in cultural history.
Main idea	Engaging students' imaginations is crucial to successful learning. If we want to be able routinely to engage students' imaginations in learning, we must understand the main cognitive tools they have available for learning. We must shape our lessons to fit, and to develop, their cognitive tools.

Below are some of the main cognitive tools students will possess in greater or lesser degree as they develop theoretic thinking

The sense of abstract reality	is a tool that develops as a part of the development of "disembedded", rational, logically structured forms of thinking. It has historically been the source of our understanding of the processes by which nature works, and our increasing control over these processes, but can come at the cost of our alienation from the natural world—so that we might see nature, for example, only as a set of "resources." It enables us to make sense of the world in terms of abstract ideas.
The sense of agency	is a tool that enables us to recognize ourselves as related to the world via complex causal chains and networks. This enables us to become more realistic in understanding how we can play roles in the real world, and understand ourselves as products of historical and social processes.
Grasp of general ideas and their anomalies	is a tool that enables us to generate abstract ideas about nature, society, history, human psychology, and then recognize their inadequacy, and rebuild them into more complex ideas.
The search for authority and truth	is a tool that takes on a particular shape and importance with the development of abstract theoretic thinking. Because meaning is seen to be derived from general ideas it becomes vital to determine which ideas are true. An objective, certain, privileged view of reality is sought. Among the historical products of this cognitive tool at work have been dictionaries, encyclopedias, and textbooks—repositories of secured knowledge.
Meta-narrative understanding	allows us to order particulars facts or events into general ideas and form emotional associations with them. That is, we don't just organize facts into theories, but our tendency to shape even our theories into more general meta-narratives also shapes our emotional commitments to them.

Here again, the topics indicated above have been brought into focus by taking the engagement of students' imaginations as a central concern. If engaging students' imaginations is held steadily to the fore as a condition of successful teaching, then the kinds of categories mentioned above, and explored in more detail below, represent the kinds of things to which we should attend. The task is perhaps made a little more difficult in this case because this set of tools is more abstract and theoretic. If we think of our task as not just teaching knowledge and skills, but as also engaging our students with the general ideas that underlie the knowledge and skills they are learning, we will be able to make our teaching more engaging to their imaginations, more meaningful to them, and more interesting for the teacher too. Also the tools that we

looked at in the previous pages—stories, abstract binary opposites, metaphors, images from words, etc. and extremes and limits, associating with heroes, the sense of wonder, etc.—do not go away as we develop theoretic abstractions. They are still available to be used.

Oh dear, another pile of jargon up-front. What distinguishes this “theoretic thinking” from the other kinds of thinking and their tools described on the other webpages? And what set of cognitive tools can we see operating in it? Everyone has some sense of what theoretic thinking means. The trouble in using the term in a title like the above is that I run the danger of making into jargon something that has had a perfectly happy life in people’s minds designating something perhaps not as specific as I want to use it for here.

An example might help introduce what I mean by the term. I remember driving one of our sons to soccer when he was about fourteen. We were coming up to a federal election and many of the lawns and windows we passed had sprouted posters in bright red, blue, yellow, and green encouraging us to vote for one or another candidate and party. In the previous election four years earlier, our children had been interested in how many signs were up for “our” candidate, who had the most signs and the biggest signs, which party was likely to win, and how could anyone vote for the villains who opposed our good guys. Putting his soccer boots on in the car, on this later occasion, our son asked whether we had to pay to have a sign on our lawn, and whether people with the really big signs had to pay more, or did the candidates pay us to put signs on our lawns. I told him that the candidates and their parties paid to have the signs made, or made them themselves, and people put them on their lawns freely to show their support. “But why would people vote for some party because of a sign on a lawn?”—he reasonably asked. “If the parties and candidates represented particular social values and priorities, wouldn’t people vote based on their principles, rather than be swayed by lawn signs?”—he reasonable continued. We discussed this for a while, and his questions spread to the ways in which lawn signs were a part of the process of democratic elections.

My point is not just to show off what a clever bunch of kids we have (though . . .) but rather to indicate an example of a shift in thinking and in the set of cognitive tools that are being brought into play. My purpose here isn’t to try to explain why this change occurs, typically in the mid-teens among students who have continued to develop their literate cognitive tools, but rather to describe some of its features in such a way that we can see how we might engage the “theoretic” imagination in learning. (An attempt at explaining why this change occurs can be found in Egan, 1997.)

I assume that this topic will be of most interest to senior high school and college teachers, though some of these tools will have begun embryonic development in many younger students, so the tools described could be used in earlier years where teachers think appropriate. Given the nature of topic, it will be hard to avoid using an abstract theoretic language, which will likely make the going a bit harder. Trying to compact these ideas into the table above has not been easy, and as I look at some of the definitions, they seem a bit clotted. But they might give some idea about these cognitive tools, and I will elaborate and clarify them below—I hope.

Let us look at each of the “cognitive tools” mentioned above in a little more detail, focusing on how they are to relate to teaching.

## **The sense of abstract reality**

That conversation I mentioned above about lawn signs during the lead-up to an election indicates how the everyday reality of visible things begins to generate another reality made up of general ideas. What happened during this conversation—and during other conversations and in subjects he was learning at school and seeing on TV—was the generation of new meaning to the idea “politics” and to the idea “society” and to the idea “democracy.” In addition, these hugely abstract ideas were being connected one to the other as well. In the past, no doubt he understood—in the sense of being able to give some adequate definition of—the words “politics,” “society,” and “democracy.” But the conversation in the car indicated that these words were taking on new and quite significantly different meaning.

No doubt he had used these words in conversations before, but they were now beginning to appear in discussions more frequently and prominently. They were no longer words he knew the meanings of, they had become, in some sense, “things” in their own right. “Society” was not now a rarely used and rather vague term; it used to refer vaguely to houses and families and neighborhoods and social services and the government, and so on. Now it was gathering precise meaning as an abstract composite of all those things.

“Theoretic thinking” is the development of this new world of abstract ideas and the growing ability to think in terms of these abstractions, and then connect the results of abstract thinking back to the concrete world. We can see it, and feel something of the difficulty of this kind of thinking, in those familiar word puzzles in math (student). We are asked such things as “If a man took a train headed east from Albuquerque at 60 miles an hour and another man took a train traveling at 80 miles an hour from . . .” and we are then invited to calculate where they would pass each other. What we would like to be able to do with such problems is stay in the real world, and watch the actual trains from about a mile up and observe where they pass each other. But this is math class, and what the teacher wants us to do is leave behind the world of the anonymous man on the train from Albuquerque, and abstract the problem from the real-world situation and convert it into numbers and apply a formula and calculate where the two men would pass. We are not invited to wonder whether they are sad or happy, or tall or short, or are good at baseball, or fathers of sons who want to know why people would vote for a candidate because there are lots of lawn signs with her name on. Instead we are invited to enter the realm of abstract reality.

During the period when literacy drives the development of the cognitive tools mentioned in the “romantic” page, the student’s engagement of reality is quite different from that which occurs with the development of abstract theoretic thinking. We might get some clearer sense of the difference by thinking of students’ educational development as like exploring a landscape, or finding their way around that Italian hill-town I generously, virtually, took you to when describing “romantic” tools. If we think about how students use the tools developed earlier, we may represent their previous method of exploration as trying to get a sense of the most extreme features of the environment, finding out its limits, looking in awe at the biggest buildings, locating the main square, and so on. But now, faced by the same task, they would set about drawing a map, an overview, an image of the relationships of all the pieces within the whole. That is, they will now always search for a general view.

In the imaginative classroom the language of the theoretical world will be commonly used, but consistently the teacher will support the student in understanding and themselves using this language. The support can come by giving frequent examples of the particular elements from which the general words are derived. When, for example, the word “society” is used, the teacher will not be able to assume that all students will have in place a robust theoretic sense of its meaning. So, on occasion, the teacher can elaborate a bit, reminding students how the term developed. I find that a dictionary of word origins can be invaluable for supporting the development of theoretic cognitive tools. So, in five minutes or less, the teacher can discover that the word comes from the Latin “socius,” which means a companion. Our society is made up of our companions, that is, people who share common purposes (actually, companion means literally people who share bread with us, from com (with) and panis (bread)). The word “society” began to be used more commonly in the nineteenth century, when society began to become more complex, and people increasingly felt they maybe didn’t feel very companionable with many people in their shared society. The abstraction of the word suggests something of the difficulty people have now of being more precise about what everyone in a society share in common.

Well, what I intended to show here is not some accurate etymology but rather the kind of talk that can draw students in the direction of theoretic thinking. Having begun talking about “society” like this, the teacher can ask student opinions about why the term became more common at the time when society became more complex and alienating for many. Then you might spend five minutes with the word “alienating.” But also it might be useful to bear in mind that there is also a class to teach on some other topic!

Everything we teach will have theoretic dimensions, and teachers will be able to stimulate and develop students imaginations by being alert to the various theoretic paths that lead to and from whatever is being taught. If we are teaching about light in physics, it will be helpful to alert students to the main theoretical

disputes that have taken place and continue to take place about the nature of light, or about Shakespeare, or the geography of ocean floors, or calculus, or anything. The trick for the teacher is being aware of the extent of theoretical thinking the particular group of students can handle by themselves, and be ready to provide support to those less sure-footed in this rather heady realm.

## **The sense of agency**

If I may stay with our son in the car on the way to soccer practice, you may also see how his questions about the lawn signs give hints of another shift that is going on in his thinking, related to the cognitive tool mentioned in the previous section. Four years earlier, at the previous election, he was interested in "sides" and in what our chances were of beating the main opponents, and so on. None of his earlier questions suggested that this was some process in which he had any part, except as an observer or through his parents. But in the later conversation in the car it is becoming clear that he is beginning to see that the lawn signs were just one part of a general process. His environment, that is, begins to shift from one of particular events and objects to one in which particular events and objects are parts of more general processes, which can only be understood by allowing words like "society," "politics," or "democracy" to become infused with new, important meaning.

As he begins to see the world as one in which abstractly described processes are common, and important for understanding, he begins also to develop a sense of himself as having a role to play in these processes. His very "self," he begins to realize, is also a part of various processes. He is who he is—he increasingly understands—as a result of things that happened in the past; he is part of an historical process. He comes to realize: "I was born with a past" (MacIntyre, 1981, p. 205). With the development of the cognitive tool that allows clearer understanding of abstract processes comes the development of an understanding of oneself as having a role to play in those processes. As theoretic thinking becomes more elaborated so too will students' sense of themselves as agents in social, historical, political, familial, etc. processes.

In the imaginative classroom we will seek to encourage the development of this cognitive tool by encouraging students to take part in activities that will help stimulate their sense of agency. Most subjects in the curriculum need not be inward looking to simple mastery of the material but can offer opportunities for students to look outward to society in general and recognize that they can play roles of value or pleasure. "Service" activities are one common way to support this developing cognitive tool; students can help out at elections, interview old people they know or can be put in touch with, write letters to politicians on issues that have come up in their classes, or write letters to historical figures they have been learning about—Napoleon is as likely to read them as some politicians today! They can be encouraged to vote in on-line referenda on issues that interest them, they can help out with some environmental preservation of reclamation project, involve themselves in church activities, or help a group of friends for a club or team of some kind. Math examples that focus on important local issues, bringing statistical clarity where there has been only rhetoric, can lead to a letter to the newspaper. Geography examples can lead to a reclamation project. History studies that enlighten a current political issue and can be written up and sent to participants in the issue. (I often think current proponents of voucher systems in education might benefit from a brief and clear account of the late 19th century "payment by results" schemes in England). Implications of physics or chemistry studies can be directed to outside groups for whom they have relevance. The purpose of these quick examples is not to engage students in some particular form of activism, or to select for the curriculum things that are "relevant" to current social conditions; rather the regular curriculum yields endless examples of new learning that students can use to stimulate and develop their sense of agency within the process that surround them.

## **General ideas and their anomalies**

Theoretic thinking is accompanied by, or caused by, the development of a perspective on the world that begins with the general. That is, meaning is not first looked for in events or objects in themselves, but events and objects are seen in terms of the process, or system, or whole of which they are parts. Perhaps the

easiest example of this is our understanding of history. During the earlier period, history was understood as a series of dramatic events and characters, styles of dress and modes of shelter, etc. The students' interest was caught by the heroic character, the courageous rebellion, the wise ruler, the astonishing achievement, the exotic customs, and so on. Now these are no longer seen as more or less isolated incidents and characters with which we associate directly. They are understood in terms of the complex process of history, as examples of a continuum of styles and customs, of a range of possible human behaviors within physical, psychological, and emotional constraints.

The meaning of historical events is no longer sought in terms of their drama; the meaning of history is located in some general belief about the whole process, and the meaning of particular events is derived from that conception of the whole. The arrival of Columbus in North America is no longer seen simply as an heroic achievement full of good, or evil, consequences. It is seen rather as an element in large narratives of technological development, of national cohesiveness and royal or bourgeois investments, of patterns of disease and immunities, of the spread of plant species around the planet, of the character of European culture as exemplified in its contacts and conflicts with aboriginal Americans and the character of American cultures as exemplified in their contact and conflicts with Europeans, and in dozens of large meta-narratives that can be used to prescribe the meaning of the contact. By seeing the event in light of multiple meta-narratives, students will learn the complexity of the "truth" of the event, and Columbus's role in multiple narratives will further the process of sophistication of theoretic thinking.

Some students who develop theoretic thinking may conclude, for example, that the huge generalization that the world is going to hell in a handcart is true. They will accept without much qualification that stupid and greedy decisions are being made that will wreck our environment, run us out fuel supplies, destroy our industries and cities, and so on. Alternatively, other students might conclude that the world is gradually getting better, that human beings do create crises for themselves but their energy and ingenuity always solves the problems, and that life is on an uneven but gradually upward curve towards a better future for all. We may call such people pessimists and optimists, though each calls themselves realistic. But their pessimism and optimism have been made into theories of history and society. There is no use simply confronting either of these positions with the opposite, as each will think the others are simply ignoring the important information that supports the right set of beliefs and is instead focused on superficial and largely irrelevant facts.

The route to developing theoretic thinking is in part a familiar old technique. We sometimes call it the dialectic—questioning and answering in defense of some hypothesis. Most commonly, in the example above, it might involve the optimist and the pessimist questioning and answering each other in an attempt to reach the truth. What such a method usually achieves is greater sophistication in methods of argument but not, usually, agreement about the truth.

Students who are inclined to believe that everything is going to hell in a handcart (a phrase that sounds better than the image it generates) can be helped to make their belief more complicated by being shown specific cases where there is some obvious improvement in people's lives. One might point to surgical techniques that enable older people with arthritic joints to get around with greater ease and less pain. The pessimistic student will have no difficulty accepting that some things, like this, may be getting better, but, on the whole, things are getting worse. The counter-example serves as an anomaly to the general belief. It is not a counter-argument; it is not part of an argument for an optimistic view of current conditions and their general direction. It is just an anomaly to their general belief. They have to reformulate, in however small a way, their belief to take account of the exceptions to their general view.

One might then add other anomalies. One might point to the eradication of certain diseases. This might encourage the pessimistic student to modify their general belief a little more, or it might lead to the claim that eradicating diseases only makes overpopulation worse and will hasten the catastrophic effects of mass starvation. One might then add the anomaly to this position that more food per person is being produced now. And so on. The teacher might provide similar kinds of anomalies to the students who take the optimistic view.

In positing anomalies to any belief or general position the aim is not to disprove the belief, but simply to compel its holders to make their position more and more sophisticated. The fruit of this procedure is not truth with a capital T, but an eventual recognition by the students that such general truths are not realizable. There are good grounds to think some things are getting better and that some are getting worse. Even if, during this century, we run out of breathable air and drinkable water, and perhaps blow up the planet, this won't prove the current pessimistic hypothesis true. It will mean that the grounds for their present predictions were well-founded. But that is different from the general belief that they are true. What this more complex and sophisticated condition achieves is a reduction of general and unsustainable ideological and metaphysical beliefs about human nature, society, and history. And this condition of mind should allow us more clearly to focus on the current problems and hopes behind which we can throw our efforts.

Why am I dragging you through this rather vague and general discussion? Well, I wanted to sketch a pedagogical method that is particularly useful for helping students develop theoretic thinking—the practical implications of which we'll explore later. Forming general ideas and then dealing with anomalies to those ideas is one of the main tools for furthering students' education once this process of building abstract worlds has begun. It's not the quantity of physics or history they learn that will make our students more educated, it is the degree of sophistication of the theoretic thinking they develop in the process of learning physics and history that is crucial, and the sophistication of the theoretic thinking they use to understand the physics and history. Indeed, and hardly coincidentally, to move through this process, the students will have to learn a great deal of physics and history etc. The anomalies only work if they spur the student on to discover new knowledge to defend their increasingly precariously held theories and general schemes.

## **The search for authority and truth**

A tool one can see constantly at work in theoretic thinking is the search for a bedrock to one's knowledge and beliefs. It isn't enough to accept some set of beliefs as simply those one has inherited. One needs to establish that they are true, and if they aren't, then one must find those that are. This search for security extends through all the theoretic thinker's life, even to quite trivial things. The sense that truth and meaning are to be located first in the general and abstract, drives the theoretic thinker constantly, even if subconsciously sometimes, to look for the abstract source in which authority and truth can be located. If the abstract thinker loves singing, it will no longer be sufficient to simply prefer some singer over another. She will draw up criteria for goodness in singers, and compare singers in terms of these criteria. As theoretic thinking becomes more sophisticated, this becomes a tricky business. Callas may seem best according to some criteria, but Bartoli better according to others. Perhaps one should have different criteria and categories for contraltos and sopranos? Callas at some times in her career was better than others, and Bartoli is not so good with some composers, and . . . and . . .

If he is a fan of boxing, there will appear the drive to decide criteria that determine goodness of boxers. Was Ali the greatest, as he said, or Louis? But should we have different criteria for heavyweights from lighter weights? But maybe the ultimate criterion would be who would win in a bout between the various boxers at their peak? But on some days, a lucky move or unexpected blow could change the whole course of a fight from the way it might have gone some other day, and . . . and . . . Trying to sort out our preferences and beliefs leads constantly to reflection on the criteria that are appropriate, the sources of authority for beliefs. In all areas we can see this move; from participating in social events to developing social theories, from participating in religious practices to developing a theology, from participating in everyday life as it passes to developing a theory of history, from participating in politics to developing an ideology, and so on. In each of these cases, and so many others, we see another side of the development of that abstract realm of ideas, and, within that abstract realm, attempts to sort out how to know securely, what to rely on, how to establish some basis for one's ideas. It's hard work, and most people don't do much of it unless supported by a community, such as a school or college or university or reading and study groups consciously dedicated to developing abstract thinking. That community can also include certain kinds of journals, TV shows, lectures, discussions with particular people, and so on.

In the imaginative classroom what we see in the above examples will be applied to all areas of the curriculum. If we want to engage the theoretic thinker's imagination in learning, we need to make sure that we present particular knowledge in a context that invites the student to see the knowledge in terms of some general and abstract idea. The more general and abstract the better initially. Historical facts can be presented within a context of huge historical processes—the kinds of meta-narratives you will find on the Teaching & Curriculum pages of this website. Students will be expected to learn about the conclusions of the Council of Trent in the context of ideas about religion's social impacts and roles, or in the context of theological ideas in cultures around the world. Was the Council of Trent's contribution to the Counter-Reformation good or bad for Catholicism, and for Christianity in general? How can we know?

Facts about particular animals can be presented in the context of theories about speciation; students will be expected to learn about the behavior of voles in the context of evolutionary theory and environmental ideas. What would happen if all the voles disappeared? What kind of environmental disaster would result? How about the disappearance of mosquitoes? How can we know whether the evolutionary accounts of mammal development are accurate? Facts about social groups can be presented in the context of sociological and anthropological ideas; students will be expected to learn about shopping statistics to support or challenge theories about human nature or in the context of cross-cultural comparisons. Has shopping replaced religion for some people? Are the economic benefits derived from consumption of certain goods that do little if anything for the lives of many consumers off-set by spiritual desiccation and environmental degradation, or not? How could we reliably compare such things? What are the benefits to our patterns of shopping compared to the way people in oral cultures gathered what they needed and wanted?

Not great examples, perhaps, but the point is that the imagination will be more readily engaged if the particular is always seen in some more general context, and particularly if each new piece of knowledge can play a role in challenging or supporting some developing general idea or belief.

## **Meta-narrative understanding**

Meta-narratives are overarching narratives; they are techniques for organizing facts, events, beliefs, ideas into general wholes that orient our emotions to the elements that make them up. Remember the discussion of stories in the page concerned with the cognitive tools of oral language? Meta-narratives share with the simplest story the shaping of emotion, but in this case the constituent parts of the meta-narrative that are organized into some new whole is the material of theoretic thinking. The meta-narrative might be concerned to orient our moral or aesthetic or social or other emotions. The meta-narrative provides a very general perspective.

So, for example, one might make some sense of the conflicts and language evident in the aftermath of the destruction of the World Trade Center twin towers in September 11th 2001 by viewing the event through the competing meta-narratives of Christian and Islamic traditions. In the West, this event is fitted into a meta-narrative in which it can be described only as the evil act of terrorists, in response to which a "war on terrorism" is to be fought. The connection of this meta-narrative with a long largely Christian tradition of Western expansion and liberalization made it easy for the then President of the United States, George W. Bush, to talk about the response of American forces as a "crusade." In a militant Islamic meta-narrative, the oppressive Western "devils" were being struck by heroic soldiers of God who sacrificed their lives rather than accept continual oppression and the suppression of their way of life. The invasive pressure of Western capitalism and its associated ideologies is seen as simply a continuation by other means of the violent and destructive crusades of earlier centuries. Other forms of this meta-narrative appear in conflicts between globalism and multiculturalism, sustainability and growth, and so on. If we had been looking for examples a few decades ago, Marxist and Capitalist meta-narratives might have proved more apposite.

You can see, in the rather crude description of the competing meta-narratives that make different sense of the World Trade Center conflagration, how a meta-narrative is not just a logical structuring device, but is primarily responsible for orienting emotion. And as our emotions are commonly caught up in establishing the meaning of events and facts then meta-narratives will play an important role in educational

development. We may spend much of our adult lives trying to shake off the crude meta-narratives that mislead our minds, but the educational answer is not to ignore or suppress use of this tool because it might mislead us, but rather we need to use it sensibly, understanding clearly how it can help us achieve particular important ends. (Just as we don't argue for the destruction of hammers because they are not useful for sawing and can enable us to smash things, so we would be silly to argue for the avoidance of meta-narratives because they can have bad consequences if misused. The problem with any tool, workbench or cognitive, is that it can be misused. The educational virtue is to understand the tools available to us and to understand and teach how each may be best used.)

A final characteristic of this cognitive tool of theoretic thinking also raises another point of wariness about its use; that is, meta-narratives can be exciting. When we first develop the control of varied material by fitting it into some meta-narrative it gives us a new kind of understanding and sense of power over the material. We see its meaning—in a new and powerful way. For some people, the development of meta-narratives grows relatively slowly, and this sense of their exciting intellectual power is muted. But for some people it comes quickly and can be intoxicating. It can strike with great force, suggesting to the individual that at last they finally see. It is as though they come to grasp the truth behind appearances, the abstract reality that gives meaning to the concrete elements of the everyday world.

The pedagogical importance and uses of this excitement can be easily underestimated—when they are noticed at all!—and can easily be abused. So, again, dangers come with this potent intellectual tool. But there is more educational, and perhaps other, danger in not noticing it. (One thinks what a sensitive educator might have done to make more sophisticated and then displace the meta-narratives of people like Hitler or Stalin. I recognize that their problems and policies were not simply a result of inadequate teaching while they were in school! But the power of a good teacher can achieve the miraculous, daily.) Too frequently teachers in the higher grades and at college level focus on the curriculum exclusively, and do not see the students' developing cognitive tools in the curriculum material. Consequently they do not recognize how their subject can generate intellectual excitement in students.

This leads to two problems; first, such teachers simply do nothing to further the most important aspect of their students intellectual development, and, second, whatever development of meta-narratives does occur is allowed to occur randomly and uncontrolled, with no systematic use of anomalies to generate greater sophistication. In the first case, learning will become drudgery and remain largely inert for students, failing to engage their imaginations. In the second case, one may see the development of crude and simplistic ideologies, metaphysical schemes, and so on—the Hitler/Stalin problem.

In the imaginative classroom an array of the most powerful meta-narratives that have been generate in our history will be frequently called on tools. The aim of the educational process is to recognize that our meta-narratives are always inadequate, always hopelessly less rich and complex than the reality they try to represent. In science, Thomas Kuhn's hugely successful meta-narrative about scientific revolutions should be discussed at least once or twice in science classes. History studies have to keep grappling with whether things are getting better or worse, in various of the more or less sophisticated versions of these ideas. The constant raising of general theories also, at this level, serves a purpose not unlike that of raising the sense of mystery in younger students. Each works to develop cognitive tools of considerable power, enabling students to make better sense of their lives and world.

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Theoretic thinking is very various in practice but, not inappropriately, its main characteristic is the same in whatever area it is being used. The drive for the general, the abstract, the secure basis for theories, the bedrock of belief, the source of authority, the truth—all lead to the elaboration of the theoretic world, the world of ideas.



But this kind of theoretic thinking might seem to be confusing rather than useful to the student. I have emphasized its more difficult features perhaps, and how it is quite hard work to develop and sustain—so hard, indeed, that one would not be able to manage it by oneself; we need a theoretic community to keep it going. If its main purpose is the generation of an abstract world of ideas, which are difficult to keep clear and straight, and we are to spend a fair amount of effort generating anomalies to anything the student comes to believe so that we can get them over it, what's its value? Well, it is a kind of thinking that gives us great power and control over the stuff we think with; it enhances our thinking ability enormously, enabling us to put the diversity of what we have learned into a new kind of order. It also generates flexibility, encourages us to search out patterns, look for essences, and, most typically, construct theories. This set of tools gives us more pragmatic control over the world.

One point may be worth emphasizing here, and that concerns the degrees of theoretic thinking that a person can develop. Clearly we see people who hold to some “theory” or theology or ideology that is very rigid and who seem to use their idea as a means of holding off other ideas and of avoiding thinking. Sometimes we see such forms of thinking as very crude and their holders as largely ignorant even of knowledge that is relevant to their beliefs. I think one could describe these as people who may have experienced a tad of theoretic thinking, but have cut it off from development. They do not experience the increasing sophistication and flexibility that come from acknowledging anomalies to their theories or beliefs, and making their beliefs or theories more sophisticated to take account of the anomalies. That process of building knowledge to support the theory or belief and being challenged and responding by, usually, finding further supporting knowledge, simply doesn't get underway.

Which also raises a final point for this topic—the crucial role that expanding knowledge plays in driving the development of the abstract world of ideas. Ideas become rich and flexible and strong as they are supported and challenged by the constant growth of knowledge. A central feature of imaginative education that I have touched on here and there, but is worth emphasizing again and again, is that for the imagination to develop adequately and to work effectively the student needs to know a lot. Ignorance is not a condition that favors the development of imagination.