

# Teaching Philosophy with Argumentation Maps

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The greatest challenge of doing philosophy today may be one of not being able to see the forest for the trees. Whether teachers and students will readily admit to it, the content of philosophical studies is too often presented in twigs, many of which are rarely if ever connected to larger branches of thought. The problem for students is not usually one of understanding a particular argument, but rather understanding where and how all the arguments fit together.

Consider, for example, the difficulty involved in trying to determine the current status of a longstanding philosophical debate. What arguments have already been made? Which have been rebutted? Who has argued what against whom? What counter-rebuttals have been offered? The most interesting and important arguments are usually carried on in the journals of several different fields. Research and the debates over the nature of consciousness, for instance, appear in the journals of neurobiology, cognitive science, anthropology, psychology, and philosophy. How can we expect to keep track of what is being currently thought about or written on the subject?

At the same time, philosophers and students of philosophy also have wide-ranging curiosity. Most of us still want to know what's happening outside of the narrow speciality that occupies so much of our professional life. Yet we live in an age of information overload. To continue the botanical metaphor, we are too often lost in a dense wood of interesting but unconnected thought on important topics. The sheer number of good journals continues to rise, making it impossible to scan, let alone read, all of the articles that might interest us. How can we expect to navigate, let alone benefit, from such abundance?

## How argumentation maps came about

About 12 years ago I asked myself the question: What is the status of the great philosophical debates that have preoccupied humanity over the centuries? I realized almost immediately there was no easy answer. After considering the question for a while, I had to admit that I didn't have a good picture in mind about how the status would even be displayed. It was apparent that this was a worthy project to work on. I had some exposure to an emerging profession, information design (Horn, 1998b), which is concerned with exactly the issues of presentation of complex information to make it efficiently and effectively available to a wide group of people. The possibility that some form of diagramming might facilitate display of the status of a debate was the beginning of the project.

Stephen Toulmin's pioneering work, literally creating the new field of argumentation analysis (1958), offered me a framework. Toulmin had suggested that we look to how people in various professions actually argue and attempt to sort their arguments into their components (claims, grounds, backing, warrants, rebuttals). His framework provided a way to begin my early experiments. I tried that approach early on in the project and found that, graphically, it produced a page that strongly resembled a plate of spaghetti. It was too

confusing and overwhelming to the reader and the analysis was too fine-grained to provide the overview of the arguments I was looking for. After many failures, I worked out a diagrammatic scheme that clustered these Toulmin-elements into a single box connected by arrows that showed the basic relationship of "supports" or "disputes" of a particular claim (or claim plus supporting arguments). This provided both the simplicity and the structure I was after. It became clear that what I was trying to do was to create a kind of map of the great debates.

In the early 90s I began gathering a team of students and colleagues to attempt to map one of the great debates. We wanted a debate that was currently being argued, one that was neither too extensive for our resources, nor too tiny to provide a robust test of our developing methodology. Others had used Toulmin-like diagramming, but we wanted to test it on an important, sizable, real-world debate. As we completed the different topics, they were shown to experts in the relevant issues for feedback.

## **Can Computers Think? The Debate**

We settled on the Turing debate about whether computers can think (or if they ever will be able to think). The debate starts with the 1950 claim of the great British mathematician, Alan Turing. He wrote, "I believe that at the end of the century the use of words and general educated opinion will have altered so much that one will be able to speak of machines thinking without expecting to be contradicted." In short, he was certain that computers would be able to think. That was a powerful claim especially coming from the mathematician who in the 1930s invented the ideas on which the modern computer is based. For our purposes, this debate had a pretty clear beginning (although philosophers as far back as Descartes and Leibnitz had speculated on the question). It had attracted some of the best minds of our century. There was a wide range of kinds of arguments and an interesting interdisciplinary nature to the debate that would surely confront our budding methodology with interesting and useful problems. It touched on so many of the ongoing topics in philosophy, especially in the philosophy of mind and consciousness. The artificial intelligence debate also focused deeply on the philosophy of mathematics and on the philosophy of science. Moreover, it also incorporated some issues in neurobiology and opened up deeper questions as to the nature of computation and the nature of machines and persons. Yet, for the most part the debate was not too technical, and hence quite accessible to most.

The Can Computers Think? debate provided us multiple entry points into major areas of philosophy. In his paper launching the debate, Turing himself delved into many of these topics. He touched on such subjects as machine creativity, free will, and emotions. Turing asked: what is the status of God if machines can think? And, of course, with the development of the Turing Test he deeply focused our attention on the nature of thinking. All of these are topics that students can and should wonder about.

The Turing debate has engaged literally thousands of scholars, philosophers, cognitive scientists, mathematicians, physicists, neurobiologists and researchers from other fields. And has engaged some of the best minds of all time: along with Turing, mathematicians Godel and von Neuman; the pioneer cognitive scientists Philip Johnson-Laird, Alan Newell and Herbert Simon; the inventors of artificial intelligence as a field, John McCarthy and Marvin Minsky; the physicist Roger Penrose; and, of course, philosophers from Leibnitz and Descartes to the contemporaries Hubert Dreyfus, John Searle, Daniel Dennet, Douglas Hofstadter, Paul and Patricia Churchland, and many others. Surely, this debate is at the

forefront of questions of the philosophy of mind and surely it could adequately challenge our methodology.

## **The structure of the maps**

The main structure of our maps is that of a large tree with many branches. (See Fig. 1) The tree begins with Turing's claim, quoted above. The structure is then quite simple. It proceeds by laying out the branches of claim, rebuttal, and counterrebuttal. One of our criteria for mapping the debates was that if there was no debate, the claim did not make it on to the charts. Such agreements are most often found in the sidebars on our maps.

### **Links**

The major links in the maps' branches are labeled arrows, the arrows being identified by icons that bear the words "is disputed by" or "is supported by." The reader follows a branch, noting whether it is supporting or disputing the claim in the previous box, and then reads the next claim or rebuttal. Each thread of argument serves as a timeline of the argument, left to right, thus providing one of the innovations of these maps, a visual intellectual history of the debate. (See Fig. 2)

### **Claims**

Each claim box identifies the protagonist and the year and contains the summary of the claim, support, or rebuttal. (See Fig. 2) A major aim of the writing is to summarize the claim in as clear, simple, and direct a manner as possible.

### **Focus boxes**

Each of the 70 major branches or issue areas of the debates are labeled with a question and begin with a focus box that summarizes the general claim of that issue, which we call a "focus claim." These claims can sometimes be attributed to a specific protagonist in the argument. But just as often other protagonists

argue against this focus claim, even though they do not cite anyone who has actually claimed it. And, in fact, we have been unable at times to find anyone, in print, who has specifically claimed what the claim box summarized. Rather, authors will write "there are those who argue," or "it is sometimes claimed..." (For an example, see Fig. 2, Box 28)

### **Secondary Links**

Occasionally notes within the boxes provide secondary links which help readers tie together important connections.

### **Understanding the camps**

One of the difficult aspects of understanding great debates like this one, is that the protagonists come from quite different points of view. They bring vastly different assumptions about the nature of reality. Often, in a specific article students must read, the protagonists do not reveal their assumptions or their affiliation with a specific camp of thinkers. We have tried to provide a tool for learners here also. The basic clue was provided by Simon and Newell's listing of their postulates for the representationist point of view, which they call the physical symbol system hypothesis. We then wrote sets of postulates for nine other major points of view and have included them on the various maps. (See Fig. 3 for a list) We identified, where possible, which participants on the maps could be regarded as being part of a specific camp, thereby providing students with an insight as to why particular arguments might be taking place.

## **Sidebars**

To aid immediate comprehension of some of the topics on the maps, we included 50 definitions and 32 sidebars. These are located at strategic spots in the maps close to where the topics and terms are introduced.

## **The uses of argumentation maps in teaching**

Philosophical argument is a lively, current concern. We took our inspiration from the biologist Lewis Thomas, who wrote, “College students, and for that matter high school students, should be exposed very early, perhaps at the outset, to the big arguments currently going on among scientists. Big arguments stimulate their interest, and with luck engage their absorbed attention... But the young students are told very little about the major disagreements of the day; they may be taught something about the arguments between Darwinians and their opponents a century ago, but they do not realize that similar disputes about other matters, many of them touching profound issues for our understanding of nature, are still going on, and, indeed are an essential feature of the scientific process.”

### **Some possible learning assignments**

The maps lend themselves to assignments that involve students in the debates immediately. For example, an early assignment in a course could be: Choose one of the 70 major branches of the debate (See Fig. 6), decide whether you agree or disagree, and write a paper giving your reasons. A moderately more difficult assignment would be to ask students to rank order the strength of different debates on a given branch and consider why they give the weights they do to the different arguments. A more advanced assignment could ask students to come up with at least one new argument at the end of one of the branches, which represent the frontiers of the debate. An even more advanced assignment could be to ask students to write a paper that shows why two or more of the eleven philosophical camps described in postulates on the maps are debating a particular issue.

### **Excellent hook for student interest in introductory courses**

Students often find that it is easier to get into a subject that has some connection to currently hot topics in the culture. The maps can be used to introduce questions of philosophy in a way that is attractive and compelling. Many students will have heard of the IBM computer system, Deep Blue, that recently beat Garry Kasparov, the human Grandmaster champion, at chess. They may have seen it on the TV news or on the covers of weekly newsmagazines. These events make it possible to pose such questions as: Can Deep Blue really think? What kinds of thinking is Deep Blue doing? The chess-playing arguments appear on Map 3 of this series. As I have suggested above, the question about computer thinking opens more doors to more other philosophical issues than any other topic. For this reason alone it lends itself to introductory survey courses aimed at intriguing students with the study of philosophy.

### **Learning philosophy dialectically**

By watching philosophers lock horns and wrestle in an interdisciplinary arena of open debate, readers can better appreciate the subtlety and complexity of the issues with which they themselves are struggling. The dialectical method has ancient roots and remains valuable today. Socrates grappled with the best minds of Athens in public debate, and Plato recorded those dialogues as a means of teaching philosophical concepts. Argumentation maps illustrate the value of learning philosophy dialectically. Argumentation maps graphically harness the full communicative and instructional power of dialectical exchange.

### **Provide project opportunities in creative argumentation**

Rarely do students get a chance to feel that they are participating in what is happening today. It is difficult to convey a sense of the leading edge of arguments. To see where debates have stopped or slowed down, students only have to read along the right-hand edge of an issue area. Because the argumentation maps provide the thread of existing arguments, and also show where they have ended (as of now), they provide the opportunity for assigning students to select one thread or topic of an argument and try to add to it an original argument, write a critical essay about it, or read the original sources of one or more issue areas and critique them. Since the maps clearly mark the frontiers of arguments, students have a chance to engage in real debates and contribute their critical assessments as well as new arguments. This, in itself, has suggested to teachers an extraordinary educational opportunity.

### **Save time and provide context and visible structure**

We live in an age of information overload and specialization. The sheer numbers of argumentative moves (over 800); the number of authors represented on the maps (380); the number of sources that we consulted (over 1,000) and the sources that contained original arguments used in the maps (over 400) are overwhelming to the student undertaking study in this area. One graduate student in the philosophy of mind said: "These maps would have saved me 500 hours of time my first year in graduate school. For almost two semesters, I had to keep reading article after article without enough context to see how they fit in to the bigger picture. The maps would have made my whole experience a much more rewarding one." It was also interesting to hear from a professor of philosophy of mind who had begun using the maps in her teaching. She reported that "The maps have, in fact, prompted me to reorganize my Philosophy of Mind course to cover certain issues and problems from a particular approach, using the commentaries of thinkers noted on the maps--e.g. the Chinese Room in more depth, and connected more explicitly to the question 'Can Computers Think?'" (Wagner, 1998)

### **Can other topics be mapped?**

A number of philosophers have remarked on the general usefulness of our methodology and have asked us if other topics are underway. The short answer is yes. We are proceeding on maps of several other major debates, in the interdisciplinary study of consciousness (by neurobiologists, psychologists, and philosophers), in some topics in the philosophy of biology (especially in evolution), in ethics, and have proposals out for still others, especially in political philosophy and public policy issues. We believe that this mapping approach will serve education by providing a general methodological tool and by providing authoritative maps in substantive areas.

### **More opportunities**

The educational opportunities I itemized are only the beginning, because these maps are literally only a beginning. To use a cartographic metaphor, the maps are at the stage that Mercator's projections were in the creation of mapping methods. Since then literally hundreds of new and different kinds of projections have been devised. Even more sophisticated uses than Mercator ever dreamed of have been made of the mapping approaches that he originated. I am sure that other scholars will come up with creative new maps and extraordinary new educational uses for them that we on the project have not yet thought of. We are interested in feedback from the field as to other topics that might be addressed.

## **What's the answer? Can computers think?**

Our philosophy in creating the maps was not to evaluate the weight of the arguments summarized. Our goal as mapmakers was to map the debate without taking a personal stand. The maps are, as much as possible, neutral.

This highlights another aspect of our philosophy in making the maps. They are intended as educational tools to help students learn to think critically. It is left to students to evaluate the “weight” of the arguments and evidence and draw their own conclusions. Some students have been frustrated by this. They say, “So, what's the answer?” The maps do not provide the answer. This provides instructors with many more educational options and opportunities and students with the chance to evaluate the arguments and make up their own minds. It is not intended that our maps reveal the mapmakers' views.

Of course, the maps are to some extent interpretive. In writing and linking arguments, we had to condense huge amounts of information, often on the basis of highly obscure or technical literature. We also had to make decisions about placement and emphasis. The way these maps organize the debate is not necessarily the only possible organization, but it was carefully considered and weighed against alternatives. The argument summaries themselves, which is where the real dialogue takes place, stick closely to the words of the authors, the better to avoid interpretation.

## Conclusions

Karl Popper, the 20th century philosopher of science, has said, “The best tested theory is the one which, in the light of our *critical discussion*, appears to be the best so far; and I do not know of anything more ‘rational’ than a well-conducted critical discussion.” Argumentation maps provide a picture, more detailed than previously available, of how such a vast critical discussion can take place across disciplinary and geographic distances. By creating an accessible map of the conceptual territory our hope is to facilitate more global interdisciplinary debate, to bring the various sources to light, and to illuminate how the pieces of the puzzle fit together. Perhaps the very existence of the maps will provide incentive and opportunity for more interdisciplinary and international discussion. It is all too easy to repeat an argument that has already been made in a distant or obscure location, to talk past one another in the heat of conflict, or to ignore important context. It is all too easy in the age of information overload for even the most careful scholar to *not* know that a major rebuttal has already been made. Moving a serious debate forward requires a disciplined interdisciplinary and international dialectic and the right kind of tools.

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## Notes

(1) The field of argumentation analysis has several associations, including the International Society for the Study of Argumentation.

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