

# Lessons learned from using Socratic Dialogue in astrobiology education

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## Abstract

Socrates was not just a pioneer in philosophy. He was also a pioneer in education through his method of involving his interlocutors in the philosophical process. The method is often referred to as the maieutic method because according to Socrates, he helped the person he talked with to “give birth” to their own ideas just like a midwife helps other women giving birth to their children [1]. When the term ‘Socratic method’ is mentioned in relation to teaching it often refers to the method of asking questions. This is, however, not what I will talk about here. Instead I will talk about a specific formalized method for definition or analysis of a concept by a group according to a set of strict rules.

## 1. Introduction

For the past five years I have used the Socratic Dialogue to let astrobiology students make their own attempts at defining ‘life’. ‘Life’ is a key concept in astrobiology but there is no consensus about how to define it. It is therefore perfect for this exercise. I will present both how I go about performing the dialogue and my experiences of using it.

## 2. The Dialogue

The version of the dialogue I have found works best proceeds in five steps:

Step 1. Concrete examples. The students start by providing examples of life.

Step 2. Choosing the best example. Here the students discuss the examples from step 1 and chose the example they think is the most fruitful for the continuous discussion.

Step 3. Identifying why the chosen example is an example of life.

Step 4. Tentative definitions. Based on the previous discussions it is time to start suggesting tentative definitions.

Step 5. Iterative discussion. In this step the students discuss the pros and cons of the tentative definitions from step 4 one by one and suggest new definitions. This step continues until consensus is reached or the time is up.

## 3. Summary and Conclusions

Learning about a concept by taking part in the definition process is much more fulfilling than just having the definition explained by someone else. It is more inspiring and it also leaves a more deep and lasting effect on the students’ understanding of the concept.

This does, according to my experience, not just mean that the students will remember the definition or definitions they have been part of producing in the Socratic Dialogue. When the teacher later goes through the standard definition or the different uses of the concept in the course literature, the students will quickly be able to set it/them in relation to their own discussion and remember and understand it/them better than they otherwise would.

The discussions are always impressive, both to me and to the students themselves. That the students tend to get impressed by their own results is, I believe, beneficial both for their self-confidence and for the teaching.

One possible drawback is that the method is relatively time consuming. I have found, however, that it is possible to have a constructive dialogue over two hours. If it is possible to dedicate more than two hours it is even better. Less than two hours is not constructive.

The group size is also important. It is not meaningful to perform the Dialogue in very large groups. Ideally, the number of students should be around ten but between five and twenty works OK.

The primary benefits of the method can be summed up in the word ‘transparency’. The method itself is transparent. It is easy for the students to follow the process and to appreciate their own progress. The

dialogue also helps to make concepts transparent. Concepts that to begin with appear as either murky and impenetrable or intuitively basic and therefore un-analyzable, can in a few simple steps be objects of a discussion on a high level of sophistication and become an integrated part of the students' understanding of the subject.

Another big advantage I have noticed with the Socratic Dialogue, is that the discussion often continues in the corridors or on the course website long after the exercise has finished.

## References

[1] Plato: Theaetetus, Clarendon press, 1987