Chapter 15
Mapping Concepts with Fisherfolk

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ABSTRACT

This chapter aims to show how concept mapping is a technique which is capable of representing complex systems in an accessible format and offers excellent opportunities for collaboration and meaningful learning. Effective communication is at the foundation of collaborative learning and concept mapping is expressly used in this research to facilitate the dialogue between participants and researcher. The chapter starts out by situating the reader by way of a conceptual background about complex systems, followed by the basis for the application of concept mapping in this project and the specific research context - a case study of small-scale fisheries in southern Brazil. Then, an account of the use of concept mapping during the fieldwork is given, with an assessment of the technique. The chapter ends with a reflection on the experience gained so far and comments on the application of collaborative learning in similar research projects.

INTRODUCTION

Conceptual Background

Complex Systems

We live in a world where science has largely replaced religion in explaining how things work and how people behave and relate to each other. For instance, instead of having to invoke a superior being to justify the existence of the sun and how it affects us, we can rely on scientific explanations about how stars are formed and emit radiation. This was made possible because about 500 years ago some people chose to believe that humans can understand reality without recourse to deities, but using instead our capability to observe, record and organize all that we experience. In other words, we became able to justify knowledge using our reason – these were the first days of a rationalist

epistemology that would dominate our view of the world until Thomas Khun and Paul Feyerabend offered alternatives, as recently as 40 years ago (Lazar, 2004).

Although choosing reason represented liberation from a world view dictated by tradition and which was almost impossible to challenge, it also presented us with an immense task: once the myths had lost their power to explain reality, we were faced with the need to create a new way of making sense of the world. How could we approach reality, with all its diversity and everchanging nature?

The solution to this question came through a "new" science, which was now based on "clear and distinct ideas" and had man as its centre - a detached, objective and rational observer. A scientific method was devised which aimed precisely at eliminating uncertainty and simplifying reality in order to understand it (Morin, 2005). Descartes was one of the most influential characters in this movement and the following quote is typical of rationalist epistemology: "my method imitates that of the architect. When an architect wants to build a house [...], he begins by digging out a set of trenches from which he removes the sand, [...] so that he can lay his foundations on firm soil. In the same way, I began by taking everything that was doubtful and throwing it out, like sand … (Replies 7, AT 7:537)" (Newman, 2005).

This search for orderly explanations of the world would lead to the development of the so-called reductionist approach, which seeks to explain complex phenomena – those which consist of many parts whose relationships cannot be easily explained – by dividing them into smaller component units in which information can be more easily dealt with, and then combining the partial explanations (Cilliers, 2000; Ramalingan and Jones, 2008).

If we take relatively simple systems such as a ball running down a slope, it is possible to reduce it to its basic components (ball, slope, the material they are made of, the inclination of the slope) and to identify the most important relationship between these parts (how the speed of the ball varies in time) to achieve a meaningful understanding of its functioning that will hold true in other similar systems. Given that the basic conditions do not vary too much, it is possible to accurately predict how fast any ball will run down any slope.

However, not everything can be adequately explained by this approach. There are systems - groups of interconnected components - which cannot be explained by means of analysis and subsequent integration, even if these are carried out in the most sophisticated manner. Contrasting the example above, if instead of a ball running down the slope we take gas bubbles forming in a glass of soda, it is unlikely that we will succeed in explaining such a system by the reductionist approach. There are several bubbles forming simultaneously, each with different shapes and sizes, moreover, some will attract others and merge, while others will not. Still, this example is a far cry from social systems in terms of complexity. The challenge in this case is to understand the nature of the relationships between elements that make up complex systems - the interactions are not the result of stable, predictable and separable chains of relations, but emerge from a large number of intricate and dynamic sets of connections, which are meaningless when analyzed out of their context and almost impossible to approach through the examination of separate units (Cilliers, 2000).

In order to highlight the most conspicuous characteristics of complex systems, Table 1 shows a comprehensive list of its features, with a detailed description of each and the corresponding example in the case of a hypothetical fishery. It is worth noting that any social system could have been used as an example, and readers are invited to try to find similar examples in systems with which they are familiar while exploring this table. The list in Table 1 is adapted from Cilliers (2000), which also inspired the comparison of each feature in conceptual and empirical terms.

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