

Understanding the nature of disciplinary boundaries as a reason for success in interdisciplinary research

Kristof Van Assche

Wageningen University, Wageningen, The Netherlands

kristof.vanassche@wur.nl

Interdisciplinary research can succeed or not. Reasons for success and failure are manifold. I argue that one of the explanations for success is a thorough understanding of the nature of disciplinary boundaries. These boundaries are the rivers evidently to be crossed to create something like an interdisciplinary research project. If one fails to grasp the nature of the boundaries involved, the bridges will unavoidably collapse or will not be constructed at all, leaving a sum of disciplinary motivated projects instead of an interdisciplinary one. Considering the amount of literature devoted to boundaries and interdisciplinary research, and considering the available space in this article, we must limit ourselves to a very concise treatment of the subject. However, I hope to convince the reader of at least one thing: that disciplinary boundaries have several natures, and that this should be kept in mind constantly when conducting interdisciplinary research.

Let's start with a metaphor: knowledge is a puzzle. Very few people might agree on this at first, but it can be a proper description of an assumption commonly held by scientists, maybe more widely spread throughout the natural sciences. If we say a lot of scientists tend to see knowledge as a puzzle, we intend to say that they consider the whole of all possible knowledge of the world as a puzzle. So, at every moment in time some pieces are missing and some are at the wrong place. Scientific progress creates a better picture of reality. Disciplines in this view are groups of pieces with a common subject, e.g. the castle on a picture of a Swiss jigsaw-landscape.

Of course, this is partly true. Like every metaphor, it is also partly untrue. Knowledge is also a social product, and it bears the mark of its origin. It would

be better to say that the shape of the jigsaw pieces changes, that the overall shape of the puzzle changes and that the resulting picture can vary markedly across time and space. This is the case because science is not a reflection of reality but a construction of reality, and not only a body of knowledge but also a group of people. A discipline is not an amount of knowledge related to one of the subjects on the puzzle that shows us reality. It is an amount of knowledge, yes. But since this knowledge is socially constructed, we should also consider that a discipline is a group of people.

Evident and trivial as it may seem, this simple assertion has consequences not always understood in research contexts. Some of the consequences are related to the nature of disciplinary boundaries. What the French sociologist Bourdieu called the sociology of the academy plays a pivotal role in the creation of knowledge. Knowledge is created in an institute; some knowledge is more probable than other to emerge from this context. The rules and codes of the institute influence the interpretation and validation of produced knowledge. If I decide to dye my hair green and purple, I make a slim chance to be taken seriously within the scientific community in general and the community of my discipline in specific.

A scientific discipline is part of an institute. Institutions, like all organisations, cannot easily erase themselves; they have a tendency to perpetuate themselves. This can imply several things. One of them is the solidification of the disciplinary boundaries. Since reputations are built within disciplines, recognition is gained within a disciplinary community, funding is organised along disciplinary lines, validation procedures are routed in disciplines, the disciplinary boundaries are not likely to disappear. Scientific specialisation is creating more and more boundaries.

A discipline is also a group as such, by which I mean just a group of people, regardless of other characteristics, comparable to an ethnic group. And ethnic groups unavoidably have ethnic boundaries. The moment a group of people starts to perceive itself as a group different from other groups, ethnic boundaries are emerging. People define themselves in contrast to others. The smaller the difference between two groups may appear to an outsider, the more

minute differentiae will be stressed by themselves. A discipline needs identity and identity necessarily creates and maintains difference. In this respect the focus on details to highlight the difference between Germans and Dutch, in spite of their general similarity, is comparable to identity formation with and boundary maintenance between planners and architects.

A group of people can use everything as a sign of its identity. An organisation, like a discipline, can actively maintain the difference with other groups and therefore strengthen the group identity. It is also a symbol for this identity. Dress codes, hairstyles, hobbies, political orientation, it can all become a sign for the disciplinary identity, and solidify the boundaries.

A special group of distinguishing codes is codes of communication. Vocabulary, syntax and style are different in every discipline. Obviously, this is related to the subject. In mathematics, one will rarely meet the word 'dog'. However, the language used in a discipline is also a tool to refrain the public and other disciplines from participating freely in internal discussions. Because such a weak boundary could mean for outsiders that the discipline is a soft one, that it is not very scientific, disciplinary language produces a smoke-curtain.

At this point, it seems fruitful to move back to the puzzle and the domain of knowledge and reality. It was said that the shape of the puzzle and everything on it, are constantly changing. It can also be repeated that language creates and maintains disciplinary boundaries. Now I want to link these assertions to the notion of discourse proposed by the French sociologist and philosopher Michel Foucault. A discipline is a discourse in his sense; it is a structured set of ideas and the language associated to it that makes reality accessible for human thought. In the same movement, it creates reality. Discourses are contingent, cannot escape historicity, they are dynamic, and they partly define a group of people. Foucault showed how disciplines are discourses, how they originated in contexts strongly defined by power relations and by the contingent, historic, content of certain basic concepts like body, soul, matter and order. And he showed that the further evolution of the disciplines couldn't be explained without recourse to the starting point.

Bruno Latour, our next French sociologist, added fascinating glosses on this theory by pointing at the importance of methods, techniques and technol-

ogy in the development and the self-definition of positive sciences. A discipline's path of evolution is partly determined by the machines and methods developed and used. If another method had been invented, the discipline would have looked differently, and the same goes for the reality produced. At the same time, methods and machines define the group of people using them: we are not only the people who study proteins, not only the people different from others, but also the people using these methods and these techniques. Upon hearing a question addressed to them, scientists often run quickly to familiar methods and techniques, because they are familiar and because they are part of their self-definition as this or that kind of scientist.

So, a discipline is also a discourse. This implies that it unveils certain aspects of reality while covering other aspects at the same time. In the Foucauldian perspective, this is the paradoxical nature of human knowledge: the structures producing knowledge hide other knowledge, make some other knowledge-producing structures less likely to be developed. Here we appear to hear a compelling argument for interdisciplinary research. If every discipline hides knowledge, another one can fill the gaps. Then we would end up with the puzzle after all.

Unfortunately, Foucault did not make life so easy for us. A discipline is not just covering a part of reality, no, it creates it owns image of it, thanks to all the mechanisms mentioned in this text, among which the strongest are the boundary-maintaining mechanisms. We could use the metaphor of the filter: if a discipline is a filter, then an interdisciplinary research project can be a series of filters. Crossing the boundaries then implies filtering information several times in a row. The result would be a very poor image of reality instead of a richer one.

This does not mean that interdisciplinary research is impossible; it rather suggests that the reflection on a common language is of foremost importance. It also suggests that a common language should not be defined by simply finding the common denominator of the participating discipline's languages. Instead, there is a need of constant reflection on the used language and concepts, and an effort to construct a common conceptual framework, featuring at least some new concepts.

The reader has noticed that an analysis of disciplinary boundaries has in this text been combined with an analysis of the concept of discipline. I consider this necessary, because disciplines define themselves and can be defined in several ways, and the chosen type of definition evidently influences the characteristics and the role of boundaries:

A discipline is an amount of knowledge on a certain subject.

A discipline is something creating its own subject.

A discipline is a discourse, a structure producing knowledge. It is something contingent, historic, dynamic, linked to a group of people.

A discipline is an organisation of people, an institution, self-perpetuating.

A discipline is a group of people, using all types of distinctive codes.

A discipline is a language.

Such a list reflects the complex identity of a scientific discipline. Every aspect of its identity produces and maintains its own type of boundaries, using different mechanisms. Identities, boundaries and mechanisms could very partially be unveiled in this text. It may however stand out very clearly that one important reason for success and failure in interdisciplinary research is a raised awareness of the nature of the disciplinary boundaries to be crossed. Some bridges are likely to be built, others not.

References

- Assche, K. Van, Jacobs, M., *Kwaliteit in complexiteit. Ruimtelijke kwaliteit en de kennisontwikkeling daarover.* (Alterra rapport 601), Wageningen, 2002.
- Bastide, R., *The semiotic analysis of scientific discourse*, Paris, 1985.
- Foucault, M., *Les mots et les choses*, Paris, 1968.
- Foucault, M., *L'ordre du discours*, Paris, 1970.
- Foucault, M., *Surveiller et punir*, Paris, 1975.
- Latour, B., *Wetenschap in actie*, Amsterdam, 1995. [original title: Science in action]

Notes on the discussion on this paper at the Alterra- seminar

1. A distinction was made by Nick Winder between discipline and community, where discipline is considered as the top-down aspect of the knowledge-system, the institutionalized context of the knowledge-production. Community is in his view the group of people sharing [scientific] views, a bottom-up phenomenon. I presented concepts comparable to discipline and community while talking about institute and group, as aspects of the multiple identity of discipline. Therefore, I partly agree with him. The importance of his distinction deserves to be underlined, but could be placed in a somewhat different context [a disciplines' identity has many sides].

I do not fully agree with the linkage he makes between the concept couple discipline – community and the couple top-down – bottom-up. Indeed, the concept of institute is likely to entail more notions of hierarchy than the concept of group. But at the same time, groups can partly identify themselves by referring to and attaching to the structures of an institute. Order can be imposed and order can be asked for. A prisoner needs the prison after twenty years of imprisonment. He identifies with the institution, its rules, its order. Therefore, it seems difficult to maintain that a discipline in Nick Winder's conception [discipline as institution] is fully a top-down phenomenon and irrelevant for the formation of identity.

2. Arnold van der Valk mentioned the numerous difficulties experienced in the practical application of my plea for a constant reflection on common language and common frameworks. I wish not to deny these difficulties. It should also be acknowledged that some projects can fail because the task implied in the plea is in some cases an impossible one. However, I do not consider the plea as something trivial or unrealistic, since a lot of very real projects start with the definition of a common language or at least a common conceptual framework, before going back to usual, which is monodisciplinary work or interdisciplinary work without reflection on the communication. Some of these very real projects fail because after a while people started to realize that the communicative transparency created by the common framework was a false one, that people were referring to different things and concepts all the time, and using

different basic assumptions without being aware of that. Far from stating that a complete awareness of one's own conceptual world is ever possible, I only wanted to stress the necessity in interdisciplinary projects to raise this awareness.

Disciplinary perception and interdisciplinary communication in management of natural resources

E. Heleen van Haaften

Vabene, Wageningen, The Netherlands

heleenvanhaaften@vabene-research.nl

Introduction

It is recognized worldwide that problems related to sustainable production are complex and can only be resolved through interdisciplinary cooperation. Problems related to interdisciplinarity are experienced in any project where disciplines work together to achieve sustainability. These universal problems are the subject of this statement. They are discussed in the context of sustainable management of natural resources.

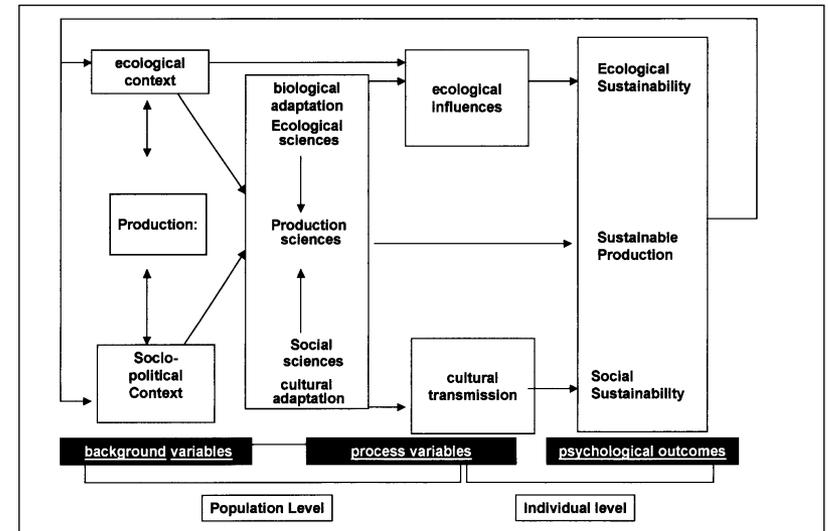


Figure 1. The eco-cultural model: three groups of sciences (ecology, production, social) perceive sustainable production in different ways (adapted from Berry et al., 1998)