

Re-thinking new knowledge production: A literature review and a research agenda

Laurens K. Hessels*, Harro van Lente

*Copernicus Institute for Sustainable Development and Innovation, Utrecht University,
PO Box 80115, 3508 TC Utrecht, The Netherlands*

Received 2 October 2007; received in revised form 29 January 2008; accepted 30 January 2008
Available online 11 March 2008

Abstract

This paper offers a systematic reflection on the Gibbons–Nowotny notion of ‘Mode 2 knowledge production’. We review its reception in scientific literature and compare it with seven alternative diagnoses of changing science systems. The ‘Mode 2’ diagnosis identifies a number of important trends that require further empirical efforts, but it suffers from severe conceptual problems. It is time to untie its five major constitutive claims and investigate each separately.

© 2008 Elsevier B.V. All rights reserved.

Keywords: Mode 2; Transdisciplinarity; Heterogeneity; Relevance

1. Introduction

Science systems are said to be in transformation. Last two decades various studies have pointed to a variety of changes, such as an increasing orientation of science systems towards strategic goals (Irvine and Martin, 1984) and the production of relevant knowledge (Böhme et al., 1983; Gibbons et al., 1994). A variety of approaches to understand, explain, and, perhaps, extrapolate such trends have emerged, but none of them is uncontested. Probably the most famous account of a transformation is the concept of ‘Mode 2’ knowledge production. This notion refers to a set of putative changes that are introduced in *The New Production of Knowledge* (Gibbons et al., 1994). The book sketches the emergence of a research system that is highly interactive and ‘socially distributed’. The basic argument is that, while knowl-

edge production used to be located primarily in scientific institutions and structured by scientific disciplines, its locations, practices and principles are now much more heterogeneous. Mode 2 knowledge is produced ‘in the context of application’ by so-called transdisciplinary collaborations. Moreover, scientists are more reflexive and they operate according to different quality criteria when compared with the traditional disciplinary mode. The new mode of knowledge production has been coined ‘Mode 2’, and it is not believed to replace Mode 1, but to supplement it.¹ Table 1 gives a summary of the basic claims in a well-known format.

In the decade since its launch by Michael Gibbons, Camille Limoges, Helga Nowotny, Simon Schartzman, Peter Scott and Martin Trow, the ‘Mode 2’ concept has gained an enormous visibility in the reflection on

* Corresponding author. Tel.: +31 30 2537597; fax: +31 30 2532746.
E-mail address: l.hessels@geo.uu.nl (L.K. Hessels).

¹ ‘This new mode – Mode 2 – is emerging alongside the traditional disciplinary structure of science and technology—Mode 1’ (NPK, p. 14).

Table 1
Attributes of Mode 1 and Mode 2 knowledge production

Mode 1	Mode 2
Academic context	Context of application
Disciplinary	Transdisciplinary
Homogeneity	Heterogeneity
Autonomy	Reflexivity/social accountability
Traditional quality control (peer review)	Novel quality control

contemporary scientific practice. The notion of ‘Mode 2’ is referred to in over 1000 scientific articles² and seems to have influenced science, technology and innovation policies.³ During the same period, however, scholars have written numerous critical papers to contest the claims and the use of the Mode 2 concept, some on a theoretical basis, others supported by empirical data. We think it is time for reconsideration of the idea of a science system in transformation and we will use the claims and contestations of the Mode 2 concept as an entrance point. To what extent is this concept helpful in describing and explaining current changes in scientific practice? What does it add to other approaches? What are the most relevant questions to address when one is interested in the transformation of science systems?

We will follow two routes, one direct, and the other indirect. First, the indirect route is to compare and contrast the Mode 2 diagnosis with a number of alternative accounts of current changes in scientific practice (Section 3), such as Triple Helix (Etzkowitz and Leydesdorff, 2000), post-normal science (Funtowicz and Ravetz, 1993) and strategic research (Rip, 2004). We will address both agreements and differences between ‘The New Production of Knowledge’ (NPK) – the book in which the notion of Mode 2 has been coined – and the alternatives. This step will make clear about which characteristics of the science system the different diagnoses make claims and it will show to what extent the claims of NPK agree with claims made by other authors. The second, direct route is to review and evaluate the numerous reactions to ‘The New Production of Knowledge’. After a discussion of its general reception (Section 4), a number of critical reactions are addressed (Section 5). The main objections that we found in the literature will be grouped under three headings: criticism regarding the empirical validity, the conceptual strength, and the political value

of NPK. Consequently, the strong and weak points of the original Mode 2 claims can be determined. We will conclude with a statement about the strength and suitability of the Mode 2 concept and with a list of topics concerning the transformation of science systems that deserve further study. First, however, we will summarise the two main publications by the creators of the concept (Section 2).

2. The new production of knowledge: Mode 2

The notion of Mode 2 knowledge production is coined in *The New Production of Knowledge* (Gibbons et al., 1994). This volume constitutes the outcome of a collaborative research project conducted by six prominent scholars in the field of science (policy) studies: Michael Gibbons, Camille Limoges, Helga Nowotny, Simon Schwartzman, Peter Scott, and Martin Trow. The work was originally commissioned by the Swedish Council for Research and Planning, FRN, aiming to get a view on the future of universities.

The main proposition of the study is the emergence of a knowledge production system that is ‘socially distributed’. While knowledge production used to be located primarily at scientific institutions (universities, government institutes and industrial research labs) and structured by scientific disciplines, its new locations, practices and principles are much more heterogeneous. To clarify this assertion the authors introduce a distinction between Mode 1 knowledge production, which has always existed, and Mode 2 knowledge production, a new mode that is emerging next to it and is becoming more and more dominant. Five main attributes of Mode 2 summarise how it differs from Mode 1 (see Table 1).

First, Mode 2 knowledge is generated in a *context of application*. Of course, Mode 1 knowledge can also result in practical applications, but these are always separated from the actual knowledge production in space and time. This gap requires a so-called knowledge transfer. In Mode 2, such a distinction does not exist. A second characteristic of Mode 2 is *transdisciplinarity*, which refers to the mobilisation of a range of theoretical perspectives and practical methodologies to solve problems. Transdisciplinarity goes beyond interdisciplinarity in the sense that the interaction of scientific disciplines is much more dynamic. Once theoretical consensus is attained, it cannot easily be reduced to disciplinary parts. In addition, research results diffuse (to problem contexts and practitioners) during the process of knowledge production. Thirdly, Mode 2 knowledge is produced in a diverse variety of organisations, resulting in a very *heterogeneous* practice. The range of poten-

² Scopus search on January 18, 2007.

³ In Canada, for instance, the creation of Networks of Centre’s of Excellence aimed at ‘facilitating Mode 2 networks’ (Fisher et al., 2001).

Download English Version:

<https://daneshyari.com/en/article/984901>

Download Persian Version:

<https://daneshyari.com/article/984901>

[Daneshyari.com](https://daneshyari.com)