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## Science Studies: An Integral Part of a Research Based Master's Degree Curriculum

Dr. Tobias Schmohl<sup>1</sup>

### Abstract

*Science Studies (German: "Wissenschaftsforschung") is one of the core modules of a new master's degree programme "Higher Education" at the Hamburg Center for University Teaching and Learning (HUL). Subject matters of this executive programme cover a broad field of higher educational issues: One of the areas of reflection dealt with in this programme are the epistemological premises and the underpinning assumptions of higher educational research. This philosophy of science view on teaching and learning leads towards a confrontation with methodological questions on research designs in this area. The discussion focuses in more detail onto the role of communication in educational practice and its research ("science rhetorics").*

*The intention of this module is to go beyond simple answers by focusing on the reflective nature of researchers investigating their own field ("scholarship of teaching and learning"). It addresses questions of higher educational research from a higher educational research perspective and therefore may be identified with the concept of "second order research": We hence aim at providing a new way of understanding higher educational research by following a second-order cybernetics and systems theories agenda, referring to von Glasersfeld, Maturana & Varela, and Luhmann.*

*We developed the master's programme by conducting a design-based research methodology. Its curriculum follows the results of this research process. Its conceptual design presented in this contribution therefore is to be classified as "research-based" rather than "based on experience".*

### 1. The Curriculum: HUL's "Master of Higher Education"

In German scholarly system, there is a broad community of experts on practical questions of university teaching: You can find a central pedagogical institution concerned with counselling tasks or trainings for the academic teaching staff in almost every university. These institutes are usually running under the label of "Hochschuldidaktik" (University Didactics) and focus on how to improve teaching skills on a predominantly "hands-on" level. Their programmes address scholars who wants to improve their teachings. Courses usually stress a broad variety of topics varying from personal skills (such as vocal trainings, for example), to educational technology issues (such as blended learning strategies or the use of clicker systems in lectures), to conceptional issues (such as course planning, for instance).

Unfortunately, these courses sometimes lack theoretical foundation and they are mostly not really linked to latest results and discourse of educational research in this field. This may be one of the reasons, why mostly undergraduates and students working on their Ph.D. thesis attend these courses. Senior lecturers or professors instead are usually very much under-represented.

Notwithstanding this situation, the Hamburg Center for University Teaching & Learning (HUL) has been founded in 2015 with three professorships and several researcher positions with the purpose to emphasize research on pedagogical issues in the field of university teaching and learning. Consequently one of HUL's tasks fields is to design and evaluate innovative teaching at the university. One step towards fulfilling this purpose is a new master's degree programme *Higher Education*. Its curriculum has been developed by the HUL during the years 2014 and 2015. Although the *concept* is a very innovative and unique one, the *label* of this programme reaches back to the late 1990s [1].

In 1999, the programme had been rolled out at Hamburg University for the first time – however with a different curriculum setting a more "hands-on" focus and not being explicitly research-based. During the years 2000 and 2003, funding by the German Federal Ministry for Education and Research (BMBF) and other institutions made it possible to continue and further evolve the programme. In 2002 the Academic Senate at Hamburg University decided to perpetuate the concept as a four semester executive programme. In this version, the Master of Higher Education had successfully run through an accreditation process in 2005 and 2013. The concept during this time consisted of modules focusing on (1) an introduction to university teaching skills, (2) course planning on an academic level, (3) leadership, (4) methodological and media-related issues. The courses were designed as skill based

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trainings, providing hands-on techniques for efficient teaching and didactics, as well as reflection of one's role as a university teacher [1, p. 14 f.], [2, p. 4 f.].

In 2014, we began to work on the first plans to fundamentally reform the existing programme. The first step towards a new curriculum was having the old design closely analysed by experts in the field of Higher Educational Research. Additionally, perspectives of practitioners, participants of the old programme, and members of the teaching staff were included in the analysis. One of the key result of the analysis phase was, that there should be a more research-based structure. We hence decided to build up and implement a whole new curriculum from scratch rather than doing some minor or major changes to transform the old one step by step. By specifically addressing topics of academic pedagogy and by focusing on university teaching and learning in particular, the new curriculum now follows an agenda which is unique to the German educational system. The first cohort encompassed 23 signed up students who commenced their studies in the academic winter term 2016/2017. Being an executive programme, the Master of Higher Education can be obtained by anyone who is part of the academic teaching staff, so professors as well as Ph.D.-Candidates or (postdoctoral) researchers as well as lecturers from different disciplines have inscribed to the programme.

## 2. The Module: "Science Studies"

In the following paragraph, I would like to give a brief overview on the outline of the module "Science Studies", which I am in charge of in the Masters' degree programme *Higher Education* at the Hamburg Center of University Teaching and Learning (University of Hamburg, Germany).

"Science Studies" is an integral part of the curriculum (see **Error! Reference source not found.**) consisting of seven modules in total: Module 1 provides an introduction to University Teaching, Module 2 is a research project in the field of Higher Educational Research (addressing topics relevant towards university teaching and learning), Module 3 – 6 aim at providing different perspectives on matters of academic teaching and learning. Module 7 completes the curriculum with the master's thesis.

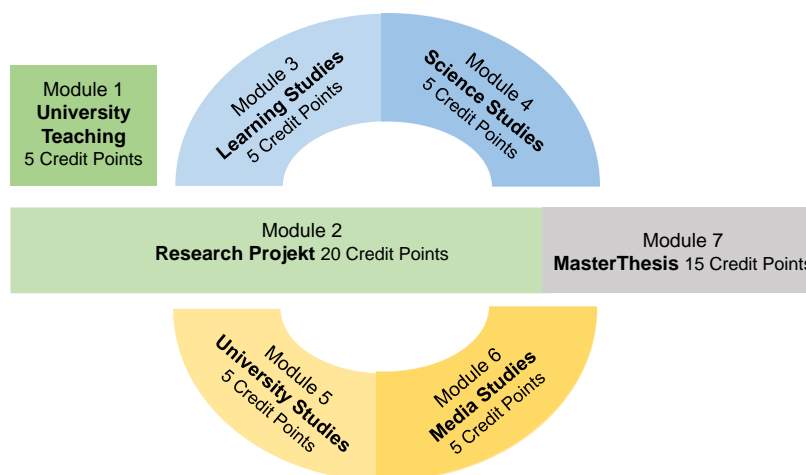


Figure 1: The curriculum of the Master of Higher Education Programme at University of Hamburg; figure obtained from [3]

The module is one of the four major modules in the curriculum, which aim at introducing theme-driven perspectives on university teaching and learning issues. Being organized as the second of these four compulsory modules, in Science Studies students get to know, how the development and functions of scientific activity can be systematically described on an interdisciplinary level, as well as from the point of view of educational and pedagogy scientists.

What kind of qualification objectives do we pursue with this module? – First of all, participants of this module will acquire practical knowledge on how to independently organize, compare, and explain key concepts of science studies in a way that makes it possible to draw operational conclusions on conceptions of higher educational theory, research and practice. The module therefore aims at the



competency to either transfer paradigms and models from the field of science studies to their own research projects, or they will apply these paradigms and models within a project related to course planning, implementation or evaluation on an academic level. Participants will be able to use paradigms and models from the field of science studies as a means to reflect, analyse, describe and assess specific problems related to university teaching and learning (including media educational issues). They will appraise research strands, reasoning and knowledge claims derived from science studies by developing a critical take on research in this field, as well as by critically evaluating its relevance towards university teaching issues, and they will use models and paradigms from science studies to design practical solutions within their research projects or in selected situations of university teaching.

The conceptual design of this module can be described in reference to three disciplinary orientations:

- (1) Philosophy of Science
- (2) Knowledge Transfer and Science Education
- (3) Paradigmatic Approaches

We labelled the first disciplinary orientation (1) with "Philosophy of Science", because we especially aim at building up a systematic, theoretical and conceptual fundament of science studies in this module; specifically by reflecting on its relevance towards university teaching issues. The second orientation (2) aims at imparting an epistemological and science theoretical fundament of knowledge transfer and science education. Finally (3), we would like to stress educational issues in the fields of philosophy of science and knowledge transfer, as well as paradigmatic approaches from other relevant disciplines (e.g. Philosophy, Rhetorics, Social Psychology, Ethnology, Culture- and Knowledge Sociology).

Teaching Methods in this module usually are predetermined by the event formats (which are block seminars and blended-learning courses). Students need to actively participate at every session to acquire the credits (5 CP in total):

- 4 CP face-to-face courses + online-courses + self-study for preparation and follow-up
- 1 CP examination.

At the end of the courses, oral or written assignments have to be conducted (which can be done individually or in a team). All courses are given in German or English language.

As the programme, in sum, aims at *formation* (German "Bildung") of reflective researchers, this module addresses questions of higher educational research from an explicitly higher educational research perspective. It aims at forming researchers who are able to and who actually do investigate their own field of practice when teaching others about their research. At this point, the concept of "scholarship of teaching and learning" comes into play [4]. Also the concept of "second order research" may be used: We aim at providing a new way of understanding science by focusing on how *scientific knowledge* (that is: knowledge on how to conduct research in a discipline at hand) is taught in comparison with *disciplinary knowledge* (that is: knowledge on subject-related issues inside a disciplinary focus) and how it could be taught from a research-based perspective. This approach may be called "self-reflective" or "second order" insofar, as it focuses on science and research matters from a research perspective under the scope of teaching and learning. Considering the fact we build up a module focusing on these more theoretical issues under the label of a Master's degree programme, claiming to deal with higher education or ("Hochschuldidaktik"), this is a rather radical thing to do. Why is that? The discipline today is just beginning to find its theoretical anchors. The distinction between "qualitative" versus "quantitative" modes of knowledge creation still may be described as the leading paradigm. Golding arrives at a similar conclusion. He puts it this way: "Higher education researchers might have an epistemology or ontology, but we rarely do epistemological or ontological research. Often there is no place for a philosophical approach to higher education. For example, when we plan research, or train new researchers, we concentrate on collecting and analysing data using qualitative or quantitative methods, without even considering the possibility of research without gathering any data" [5].

There is still a long way ahead of us, but with this module – we hope – we might at least begin to broaden our picture on which possible paths to follow. Following the concept of reflexivity, the next step should therefore be building up a second-order cybernetics and systems theories agenda in Higher Education, which could, for instance, refer to von Glasersfeld [6], Maturana & Varela [7] and Luhmann [8].





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