Abstracts and keywords

Merel van Goch, Towards a framework for identifying and classifying interdisciplinary education

Abstract More and more higher education institutions strive to increase their interdisciplinary education offerings. However, taking inventory of an institution's existing offer of interdisciplinary education proves to be a complex problem because *interdisciplinarity* lost meaning since it became a buzzword, and because multi-, cross-, inter- and transdisciplinarity are often used interchangeably. This article proposes a framework that defines interdisciplinary education in a practical way, applicable for a broad institution whose users have different expertise levels in interdisciplinary teaching and learning. The framework is applicable for: multiple ranges of education, different levels of education, both active and passive teaching and learning formats, a diverse range of assignments and assessments, various intended learning outcomes. The framework can be used at institutional and departmental level to categorize and inventory education, identify and classify, and can be translated into learning outcomes and learning objectives by programme directors and teachers. The proposed framework identifies the following aspects of interdisciplinary education: 1) a complex theme, problem or question; 2) multiple disciplines provide insight into the complex theme; 3) the insights are integrated. In addition, interdisciplinary education may include: 4) a meta-perspective on interdisciplinary theory; 5) a meta-perspective on interdisciplinary practice, including inter- and intrapersonal interdisciplinary competences.

Keywords interdisciplinary education, disciplines, integration, reflection, competences

Iris van der Tuin and Anastasia Hacopian, The Interdisciplinary Bachelor Student as Anthropologist of Science: A Reflection followed by a Didactical Assignment

Abstract This article argues that anthropology of science offers a suitable method for reflection on science and on the scientific enterprise, especially for university students with minority backgrounds enrolled in interdisciplinary bachelor programs. Anthropologists of science apply a methodological innovation that we might call a reflective method of 'conscious alienation'. Conscious alienation means that everything we know or think we know about truth, knowledge production and scientific practice should be let go in order to view these phenomena as openly as possible. Interdisciplinary bachelor's programs aim to introduce students to one or more fields of study and encourage

reflection on science and the scientific enterprise. The reflective method anthropology of science is a suitable tool for educational design with that goal, because it provides students insight into the choices that disciplines and fields of study make in order to arrive at their own approach and because it teaches students to deal with difference. Difference also concerns the frameworks about science that students receive from home or only when studying at university. The article culminates in an exemplary didactical assignment that juxtaposes disciplinary and identitarian forms of difference to foster and stimulate resilient and (self-)reflexive epistemological positioning.

Keywords anthropology of science, dealing with difference, interdisciplinary education, reflection, social constructivism, minority students

Paul Ziche, Discovering science: Images of Science in the classroom

Abstract In many key problems of today it is of great importance to have an adequate understanding of the concept and the role of 'science'. In this context, one has to strike a good balance between having trust in science's epistemic reliability on the one hand, and the openness of science, as a creative endeavour, on the other. This paper presents two lines of argument that can contribute to a better understanding of the notion 'science', and of the image of science in society, in particular among pupils at school and among students. The history of philosophy and the history of science can make clear that the concept 'science', and thus of an overarching concept that brings together different concepts and practices onder this title, is surprisingly recent (it results from the debates about Immanuel Kant's philosophy around 1800). In historical terms, thus, the scientific field cannot be expected to have a rigorous structure, it is very much an open field. This openness is visible in the fact that, for us, it is completely natural to talk about the scientist as a 'genius'. But this way of talking, too, comes forth from debates in the period around 1800. On the other side, however, the image of the scientist – that is efficiently studied via the so-called "Draw-a-scientist"-test is surprisingly stereotypical and one-sided. Both the question of the scientist as a genius and the image of the scientist can be studied in the classroom, and this paper presents some concrete suggestions for how to do so.

Keywords 'Science', philosophy and science, genius, "Draw-a-scientist"-test, science and the sciences

Niels van Miltenburg, Interdisciplinarity and Objectivity

Abstract Interdisciplinary education often focuses on carrying out an interdisciplinary study without too much attention for a theoretical understanding of what interdisciplinarity is and presupposes. In this paper, I argue that this lack of reflection on

interdisciplinarity can lead students to stick too strongly to their own disciplinary perspective which hinders true interdisciplinarity. I will attempt to address this problem by outlining a theoretical framework that leads to a better understanding of interdisciplinarity and thus gives students the tools to truly transcend their own discipline.

Keywords interdisciplinarity, objectivity, epistemic pluralism, perspective, relativism

Rianne van Lambalgen, Design and facilitation of interdisciplinary education

Abstract This article discusses the design and facilitation of interdisciplinary education in a context where multidisciplinary student teams collaborate to answer an interdisciplinary research question. More specifically, the article discusses how the integration of insights and critical reflection can be supported during the interdisciplinary research process. The interdisciplinary research process offers an overview of steps to take when doing interdisciplinary research, such as analyzing disciplinary insights and creating common ground. Two examples are given of activities that help students to share disciplinary insights and create a common ground, by having them go through the specific steps and have them ask relevant questions to each other. Next to the integration of insights is critical reflection important during all steps of the interdisciplinary research process, on the outcomes of the interdisciplinary research as well as the personal learning process. The example that is given on reflection shows how reflection on different levels can be facilitated on the literature on interdisciplinarity, on the personal learning process and on the personal attitude towards interdisciplinarity. The discussion of the article reflects on other methods for designing interdisciplinary education with the emphasis on the use of tools for an optimal learning experience.

Keywords interdisciplinary education, interdisciplinary research process, tools, integration, reflection

Florentine Marnel Sterk, Popularization of interdisciplinary research projects

Abstract Results from interdisciplinary research projects, like those from disciplinary projects, need to be communicated to non-academic audiences to have a real impact on society. In interdisciplinary training, students are taught to bring together multiple disciplinary insights to form a comprehensive answer to a complex question. The popularization of interdisciplinary projects therefore involves multiple disciplinary as well as interdisciplinary insights. The question, then, is how popularization of interdisciplinary research projects can be achieved in a way that does justice to the multiple disciplinary perspectives that take part in it. Popularization consists of the processes of reformulation and recontextualization. In this paper, I give an overview of possible popularization tools

that can accomplish these processes. After that, their applicability in the Humanities, Social Sciences and Natural Sciences is discussed. The use of tools is strongly dependent upon the chosen topic, which can be classified on a scale of living versus non-living and applied versus fundamental. Lastly, an argument is given for the role of narrow versus wide interdisciplinarity in popularization of the interdisciplinary insight. The paper shows teachers why students performing interdisciplinary projects need education in popularization skills, and what role disciplinary and interdisciplinary insights play in popularization efforts.

Keywords interdisciplinarity, popularization, reformulation, recontextualization, disciplinary perspectives

Roosmarijn van Woerden, Team work in multidisciplinary student teams: framework and reflection tool for educational development and implementation

Abstract Educators and educational developers in higher education often incorporate multidisciplinary teamwork into their education to prepare students for the analysis of complex problems as a team. The central research question in this article is: how can a research-informed framework of collaboration help design education in which students collaborate and learn in multidisciplinary student teams? First, a framework of aspects of collaboration is presented, based on a systematic review of the literature on teamwork. This framework includes external influences on the team, team input, team process, team output and the subcategories thereof. In the specific context of multidisciplinary student teams certain aspects of collaboration from the framework are extra relevant such as the role of the teacher, complexity and uncertainty of the task, task and outcome dependence, lack of time for team development, team composition, managing diversity of disciplinary backgrounds, integration of insights and leadership structures. For the development and implementation of education in which students learn to work together in multidisciplinary teams, reflection questions have been formulated for the relevant aspects of collaboration to serve as a reflection tool for teachers and educational developers.

Keywords multidisciplinarity, interdisciplinarity, student teams, team work, educational development