Paper

Genres of empirical work in university science teaching: Conjunctions of styles of thinking

Program text

Laboratory work and fieldwork in university teaching is reconceptualized in terms of the styles of thinking aimed at. Examples are given showing how styles are conjoined in different science fields.

Abstract

Introduction

A trademark of science education is the focus on empirical work in the learning activities, whether in fieldwork, laboratory work, or other types of 'practical work'. We propose to use the notion of styles of thinking (Crombie (1996), Hacking (1992)) to categorize different types of empirical work based on the reliance on and interplay between different styles of thinking. The styles of thinking are historically developed, and each style carries with it ontological and epistemological questions, recognized types of evidence and methods of employment. The styles have developed historically, but are remarkably stable over time (Hacking, 1992). The robustness of the styles, their cross cutting nature, and their emphasis on distinct modes of knowledge production in the sciences make them a fruitful basis for considering the general aims of science education. Thus, the theory of styles is currently finding its way into science education research (Kind & Osborne, 2017; Osborne et al, 2018).

Method

In the paper, we will use the styles of thinking as a framework for analyzing empirical work in different disciplines. We will consider examples of different types of empirical student work found within individual programs, but also discuss overall differences found between the programs. Examples from pharmacy and geoscience programs are given, thereby spanning a wide range of empirical formats including both field and laboratory activities.

Results

Based on the analysis we argue that empirical courses employ different genres of practical work based on how the different styles of thinking are conjoined in the specific learning environments.

Discussion

The perspective provides a new and fruitful way of conceptualizing types of practical work in science teaching, and a useful way for teachers to consider the objectives of practical work. The implications of using styles of thinking to conceptualize central objectives of practical work are discussed.

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Literature

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