RECENT DISSERTATIONS

ARE TURMO, 2003:

Naturfagdidaktikk og internasjonale studier. Store internasjonale studier som ramme for naturfagdidaktisk forskning: En drøfting med eksempler på hvordan data fra PISA 2000 kan belyse sider ved begrepet naturfaglig allmenndannelse. (Science education and international studies. Large international studies as a frame for research in science education: A discussion with examples on how data from PISA 2000 can enlighten facets of the construct scientific literacy).

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Abstract

How can large-scale international comparative achievement studies (LINCAS) be used within science education as a scientific discipline? The thesis addresses this question by theoretical discussions and by analysis of data from the PISA study (Programme for International Student Assessment). This study was initiated by the OECD and focuses on 15 year olds' scientific, mathematical and reading literacy. The definitions of the domains focus on competencies that are seen as important for participation as a reflective and concerned citizen in a democratic society. The empirical analysis in the thesis focuses on how data from the PISA study can increase our understanding of aspects of "scientific literacy".

The first major part of the thesis discusses LINCAS from a science education perspective. Possibilities and challenges from this perspective are discussed. One of the foci is how these studies are influenced by the agents implementing them, and possible consequences this may have for science education researcher working within the frames of the studies. The possible conflict between a psychometric and a diagnostic perspective is also addressed. Methodological complexity is one major challenge, and methodological issues are discussed in particular. Finally, specific aspects of the PISA study are discussed from a science education perspective.

The second major part of the thesis consists of three chapters presenting analysis of data from the PISA 2000 study:

1. Understanding a newsletter article on ozone- a cross- national comparison of the scientific literacy of 15-year-olds in a specific context.
2. The relationship between scientific literacy and learning strategies in 15-year-olds- an international perspective.
3. The relationship between scientific literacy and socio-economic background in 15-year-olds- a Nordic perspective.

The thesis is concluded by summarising general findings from the second major part. Challenges for future science education research within the frames of LINCAS are also discussed. A key message is that LINCAS have a large unused potential for science education researchers. Despite this large potential, it is also argued that the design of such studies can be modified to enhance the possibilities. In particular, it should be possible to construct tests that measure one or a few cognitive traits with high validity and reliability, and that also can be used in diagnostic analysis of students' understanding of fundamental science concepts.

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