Approaches to industrial processes in technology textbooks

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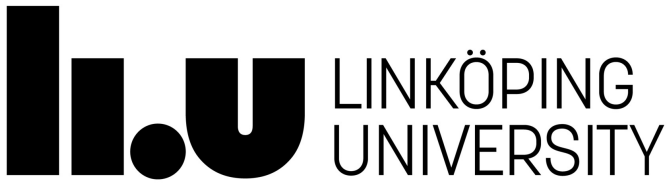

Introduction

- Well-functioning textbooks are a key factor in students' academic results
- Can provide support for teachers in planning and organising their teaching
- Can offer content support for teachers who may be uncertain about their subject knowledge
- Industrial processes is a content in technology education for lower secondary school
- With industrial processes we mean large scale industrial manufacturing processes.

Aim and research questions

In this project, we analyse four technology textbooks with the aim of investigating how their content can provide students with a foundation for describing technical solutions, especially industrial processes. We aim to identify characteristics and patterns in the textbooks regarding **what characterises the content as well as how it is presented.**

RQ:

What is prominent in the textbooks' texts and images related to industrial processes?

Theory

Conceptions of knowledge (Deng & Luke, 2008)	disciplinary conception of knowledge
	practical conception of knowledge
	experiential conception of knowledge

Method and Results

Step 1 - inductive thematic analysis of *The characteristics of the content*

Four themes were formed based on formulations from the Swedish regulatory documents:

- Purpose and functionality
- Generalising by highlighting similarities with other technical solutions
- How parts and sub-processes collaborate as a whole
- Relate to personal experiences

Results – the characteristics of the content

Purpose and functionality

- *The purpose of technical solutions and what they do is described*
- *The functionality of different technical solutions is compared based on what is to be achieved*
- *Functionality is described from the historical development in terms of economic efficiency and an environmental perspective*
- *Functionality is taken for granted*

Generalizing by highlighting similarities with other technical solutions

- *Generalization of process industry*
- *Generalization of technical solutions within process industry*
- *No enabling for generalization*

Results – the characteristics of the content

How parts and sub-processes collaborate as a whole

- *The collaborating parts are described at a system level*
- *The collaborating parts are described in detail.*

Relate to personal experiences

- *Using examples most students have experience of*
- *Using analogies*
- *Giving experiences to relate to*

Method and results

Step 2 – Inductive thematic analysis of *The characteristics for how the content is presented*

One unique industrial process is described carefully and in detail

Sub-processes and methods are presented systematically

Industrial processes are described as technical systems at a general level

Discussion

Two out of three conceptions of knowledge (Deng & Luke, 2008) are represented in the results

- The *disciplinary conception of knowledge* is highly represented
- Attempts are made to include the *experiential conception of knowledge*
- The *practical conception of knowledge* (Deng & Luke, 2008) is completely absent.

Implications for teachers

- The three approaches for how to present the content result in different foci
  - One unique industrial process is described carefully and in detail
  - Sub-processes and methods are presented systematically
  - Industrial processes are described as technical systems at a general level

- A teacher needs to be aware about what the book they use makes visible and not, and thus what they need to complement

Thank you for listening!