Informatics for All in Denmark

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Emerging political awareness in DK

- January 2016
  - World Economics Forum, Davos (4th Industrial Revolution)
- December 2016
  - Report from *The Danish Growth Council* (on qualified labour)
  - “Computational thinking for all” (one of five “here and now recommendations”)
- May 2017
  - Report from *Digital Growth Panel*
  - Entire section on digital competencies
- January 2018
  - The Government: *Strategy for Denmark’s digital growth*
  - Several concrete actions: Informatics in K-9, …
- March 2019
  - On March 14th, the Government hosts *Digital Summit 2019*
  - Presentation of K-9 Informatics and discussion of further initiatives

- Plenty of lobbying along the way…

Informatics for All in Denmark

• Two-tier strategy at all educational levels (more or less explicit)

Higher education: as AND in study programmes 2018
   Age: ~ 19-24 +

Upper secondary school: as AND in subjects 2016
   Age: ~ 16-19

Primary and lower secondary: as OR in subjects ! (→ AND) 2018
   Age: ~ 6-16

1 Awareness since 2018.
2 Long history as optional subject; see Computational Thinking and Practice – A Generic Approach to Computing in Danish High Schools for further details.
3 Curriculum developed in 2018; made public on 21st December 2018. Trial subject for three years (2019-2021) in 46 selected schools; associated implementation project...
Informatics in K-9 (new trial subject)

• Current designation
  • 'Teknologiforståelse' (~ Technology comprehension)

• Four competence areas
  • Computational empowerment
  • Digital design and design processes
  • Computational thinking
  • Technological knowledge and skills

• Two lessons per week in all grades

Novel and complementary informatics topics

“Traditional” informatics topics
Four Competence Areas

1. **Computational empowerment**
   Critical, reflexive and constructive examination and understanding of possibilities and consequences of digital artefacts.
   Analysis of technology—intention and use | Evaluation | Redesign

2. **Digital design and design processes**
   Organisation and implementation of iterative and incremental design processes considering the context of future use.
   Problem framing | Ideation | Prototyping | Argumentation

3. **Computational thinking**
   Analysis, modelling and structuring of data and data processes.
   Data | Algorithms | Structuring | Modelling

4. **Technological knowledge and skills**
   “Mastery” of digital technologies (computer systems and networks), associated languages and programming.
   Programming | Computer systems | Network | Security
Informatics (aka 'Teknologiforståelse')

Referent System (Domain)

- Problem specific concepts
- Digital design and design processes
- Concrete phenomena

Computationel use and interpretation (decoding)

Computational Model System

- Digital artefacts
- Computationel use and interpretation (decoding)
- Computationel modelling (encoding)
- Concrete phenomena

Digital technology

Analysis & Abstraction

Computationel modelling (encoding)

Computationel use and interpretation (decoding)