

Student Teachers' Preconceptions of Programming as a Content in the Subject Technology

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Introduction

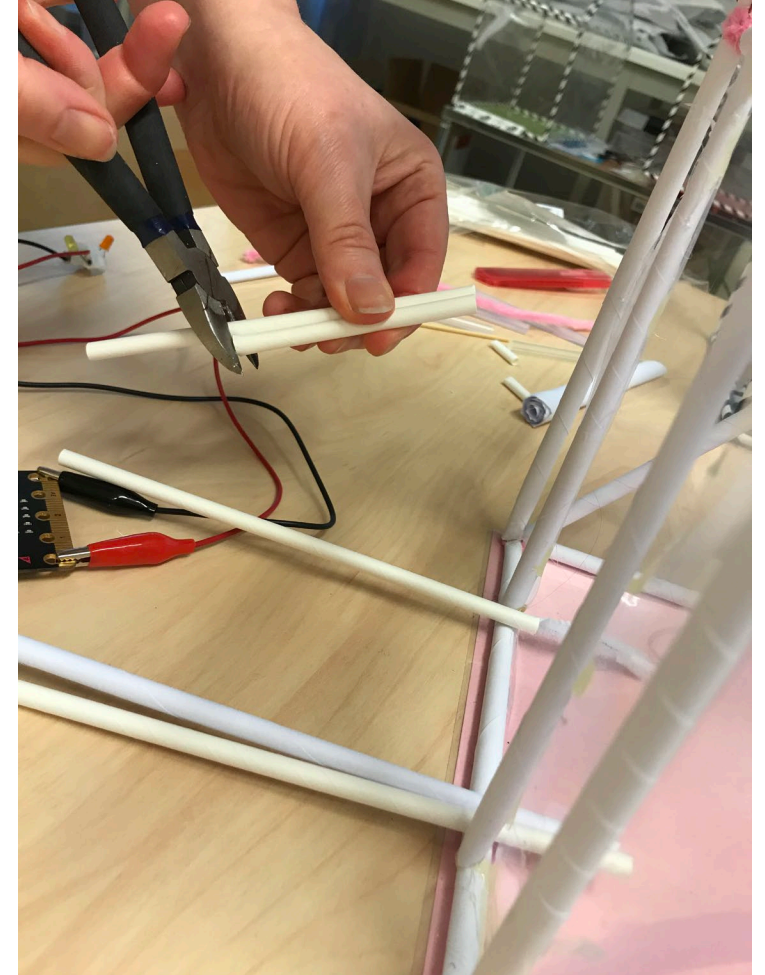
- Increased digitalization
- Curriculum changes



Teaching Programming in Technology in the Swedish Context

In grades 4-6 (some examples)

- Understand complex technological solutions,
- gain knowledge about how components work together,
- control own constructions with programming.
- Etc.



Teacher education

- Challenges for teachers
- Importance of teacher education
- Research gap

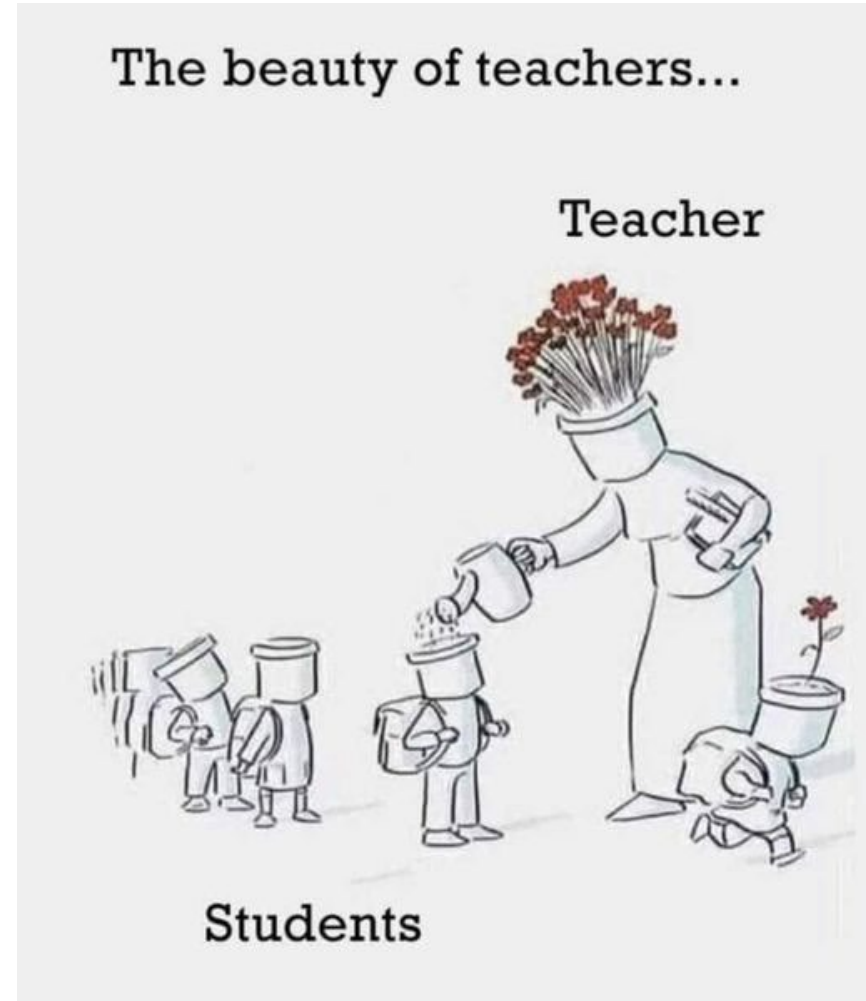


Photo: Free Grade 1 Files -Teacher Mhejz@facebook

Aim and Research Question

Aim: Investigate student teachers' preconceptions

RQ:

"What are student teachers' preconceptions about teaching programming in technology education?"



Data Collection and Phenomenographic Analysis



Interviews, transcription,



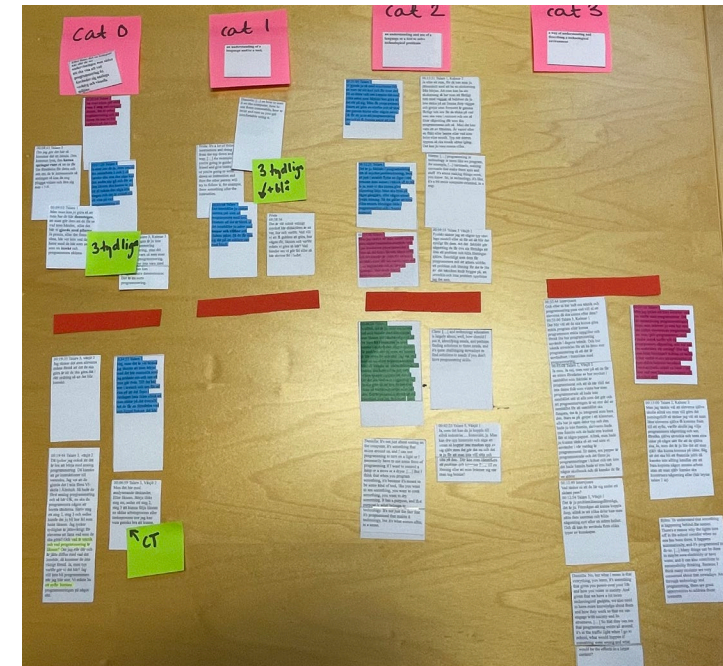
a pool of meaning, selection of sections forming an outcome space,



organizes the excerpts in similarities and differences and creates categories,



hierarchically order the categories of different ways of understanding the phenomenon.



Results- Three Categories so far

Student teachers' preconceptions of teaching programming in technology are described as:

Cat 1: an understanding of a language and/or a tool,



Aspects:

- focus on tools, codes and algorithms
- practical coding activities aim to increase awareness of instructions

[...] so how to start it on the computer, how to use these commands, how to twist and turn so you get comfortable using it.

Results- Three Categories so far

Student teachers' preconceptions of teaching programming in technology are described as:

Cat 2: an understanding and use of a language or a tool to solve technological problems



Aspects:

- a tool for solving technological problems
- to achieve practical outcomes and fulfil needs

[...] but I think that when you program something, it's because it's meant to be some kind of tool, like you want to see something, you want to cook something, you want to dry something. It has a purpose, and that purpose is what belongs to technology. It's not just the fact that it's programmed that makes it technology, but it's what comes after, in a sense.

Results- Three Categories so far

Student teachers' preconceptions of teaching programming in technology are described as:

Cat 3: a way of understanding and describing a technological environment



Aspects:

- a broader societal context
- a systems perspective
- the human-built technological environment
- understanding the consequences of decisions and actions

There's a reason why the lights turn off in the school corridor when no one has been there. It happens automatically, and it's programmed to do so. [...] Many things can be done to maybe save electricity or save water [...] and it can also contribute to sustainability thinking. Because I think many pupils are very concerned about that nowadays. And through technology and programming, there are great opportunities to address those concerns.

Discussion, our findings so far



Category 1: an understanding of a language and/or a tool,



Category 2: an understanding and use of a language or a tool to solve technological problems



Category 3: a way of understanding and describing a technological environment

- Variation in connecting programming to everyday life and the human-built environment.
- The majority of student teachers describe teaching in a way that is placed in the first category.

Discussion



Category 1: an understanding of a language and/or a tool,



Category 2: an understanding and use of a language or a tool to solve technological problems



Category 3: a way of understanding and describing a technological environment

- Computational thinking?
- Systems thinking?
- The dual nature of Technology?

What should teacher education include to train student teachers to teach programming in technology?

Thank you for listening

Questions?





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