Computational Thinking Skills in Dutch Secondary Education

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Some CT aspects can be recognized in current CS teaching practice. How can we ensure systematic teaching of CT in the CS curriculum?

The first phase of the research is focused on CT aspects in the existing teaching practice. We ask:

1. Which aspects of CT can be recognized in Dutch CS teaching materials, curriculum specifications and policy documents?

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We started with CSTA/ISTE characterization of the nine essential CT aspects (in the left column of the table). Using the CSTA examples of learning experiences and samples of existing teaching materials, we iteratively constructed a refinement of the CT characterization (the right column of the table).

Category | Subcategory
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Data Collection | Collecting data
| Selecting relevant data
Data Analysis | Drawing conclusions
| Finding patterns
| Making sense of data
Data Representation | Arrange data for analysis
| Organize/represent data
Problem decomposition | Breaking down tasks
| Merging subtasks
Abstraction | Finding characteristics
| Creating models
Algorithms & procedures | Making sequential steps in a specific order
| Understanding and changing algorithms
| Making decisions in algorithms
| Implementing algorithms
Automation | Recognizing different forms of automation
| Recognizing the advantages of automation
Simulation | Creating pseudo-code
| Creating models of processes
| Experimenting
Parallelization | Combine/merge activities

With this draft definition we shall establish CS teachers’ PCK on CT through structured interviews (CoRe).

Result of the first phase: final operational definition of CT tailored to the needs of CS course in Dutch secondary education.

ii. How can the CT pedagogical content knowledge of CS teachers in Dutch secondary education be characterized?

An instrument to assess students’ CT will be developed in the second phase. A pedagogical approach will be developed in the third phase. The effects of the curriculum intervention will be assessed in the fourth phase.