

Developing
thinking in
classrooms

Reflecting

Gathering
resources

Results of the Finnish Data

Solving and hypothesising



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THE DATA COLLECTED DURING THE SECOND PHASE OF FACTS

1. Self-efficacy questionnaire together with the other partners
2. Online questions as feedback attached to the self-efficacy questionnaire after the interventions (N=20)
3. Semi-structured interviews after the interventions (N=10; 5 teachers and 5 teacherstudents)

Unscientific data

- Memos during the meetings with the teachers and studentteachers before, in the middle and after the interventions

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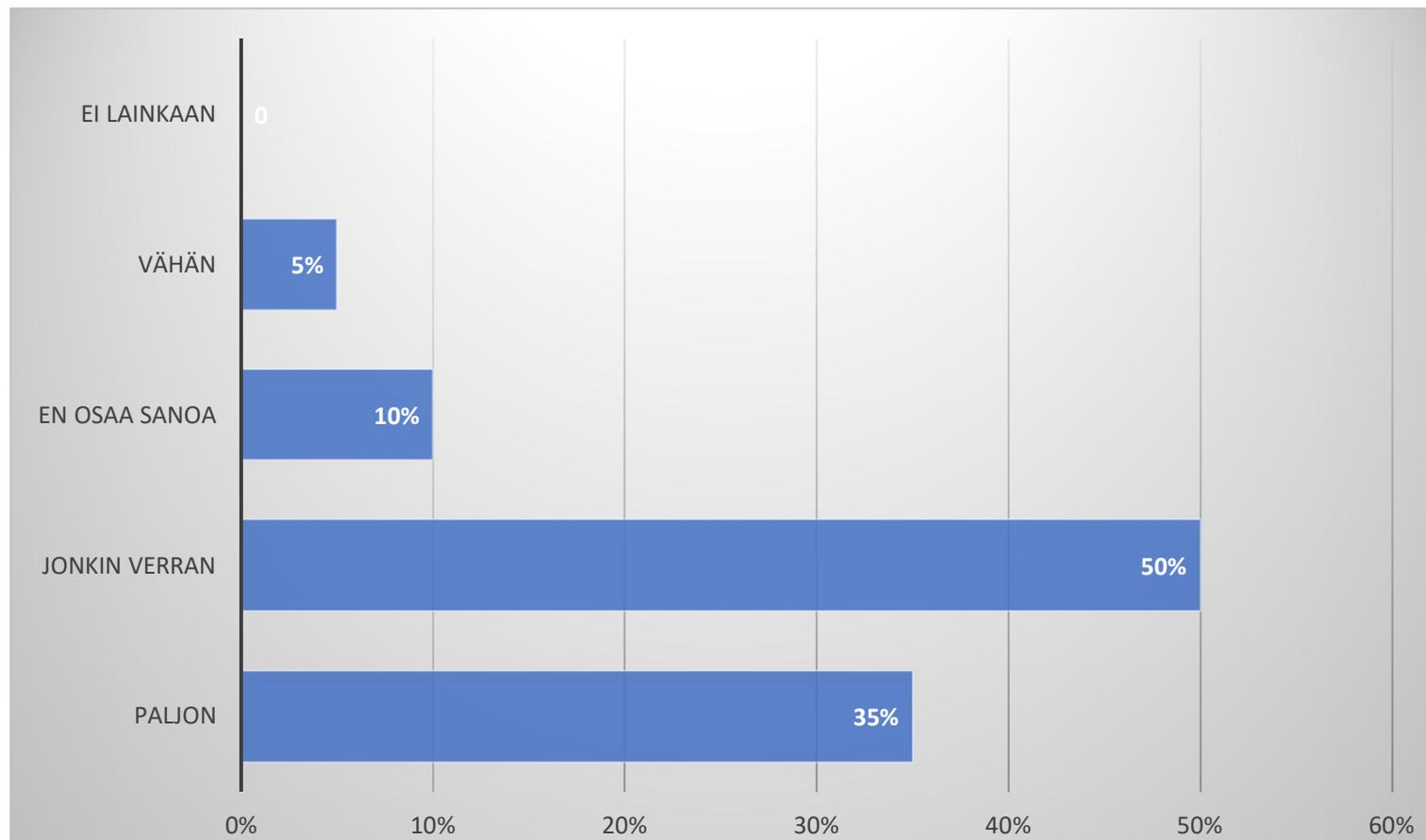
Online questions as feedback attached to the self-efficacy questionnaire after the interventions

Interacting and collaborating together



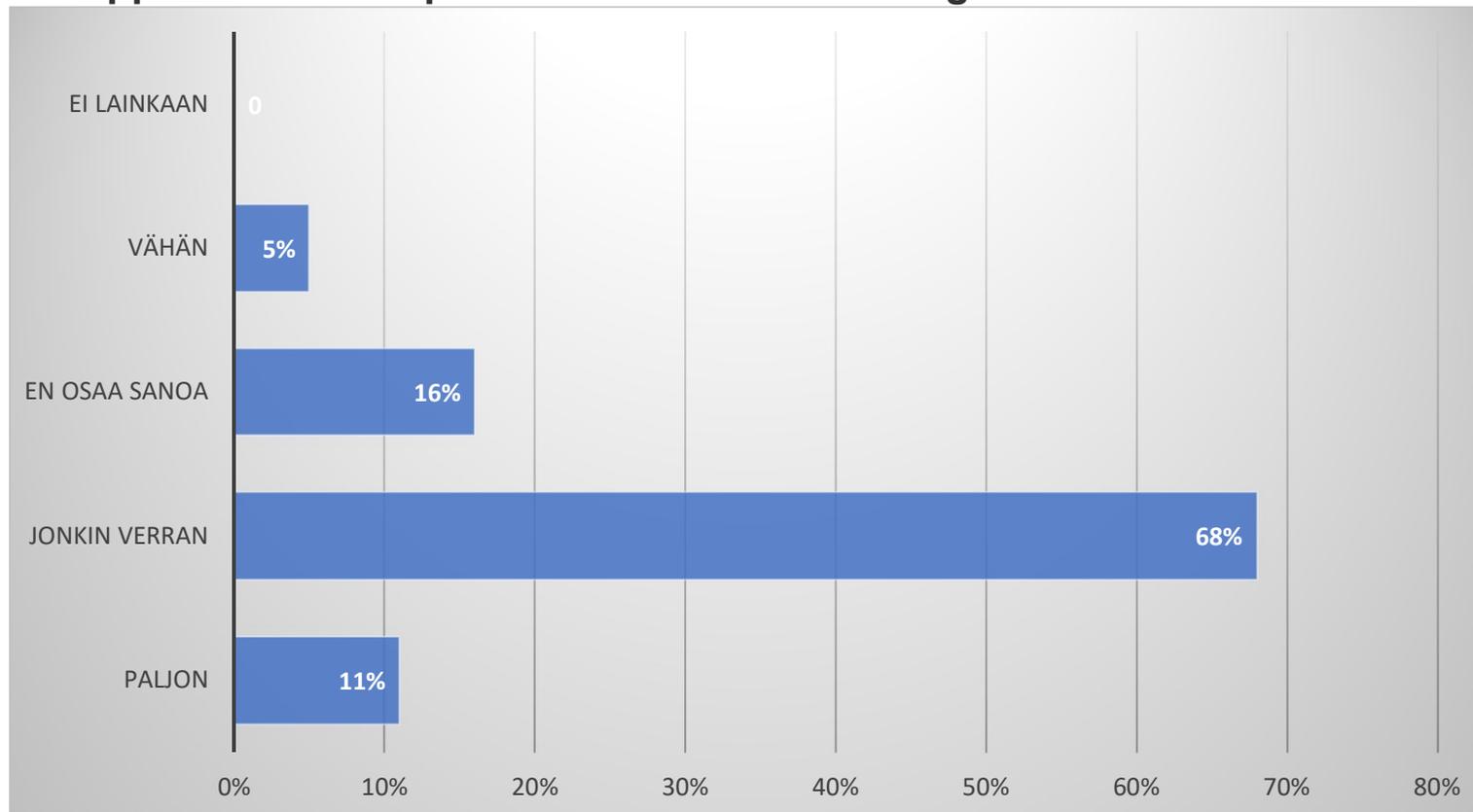
The Assessment Tools in ACTS enhance visualizing children's thinking (N=20)

Most of the participants believe that the tools enhanced visualizing children's thinking at least to some extent



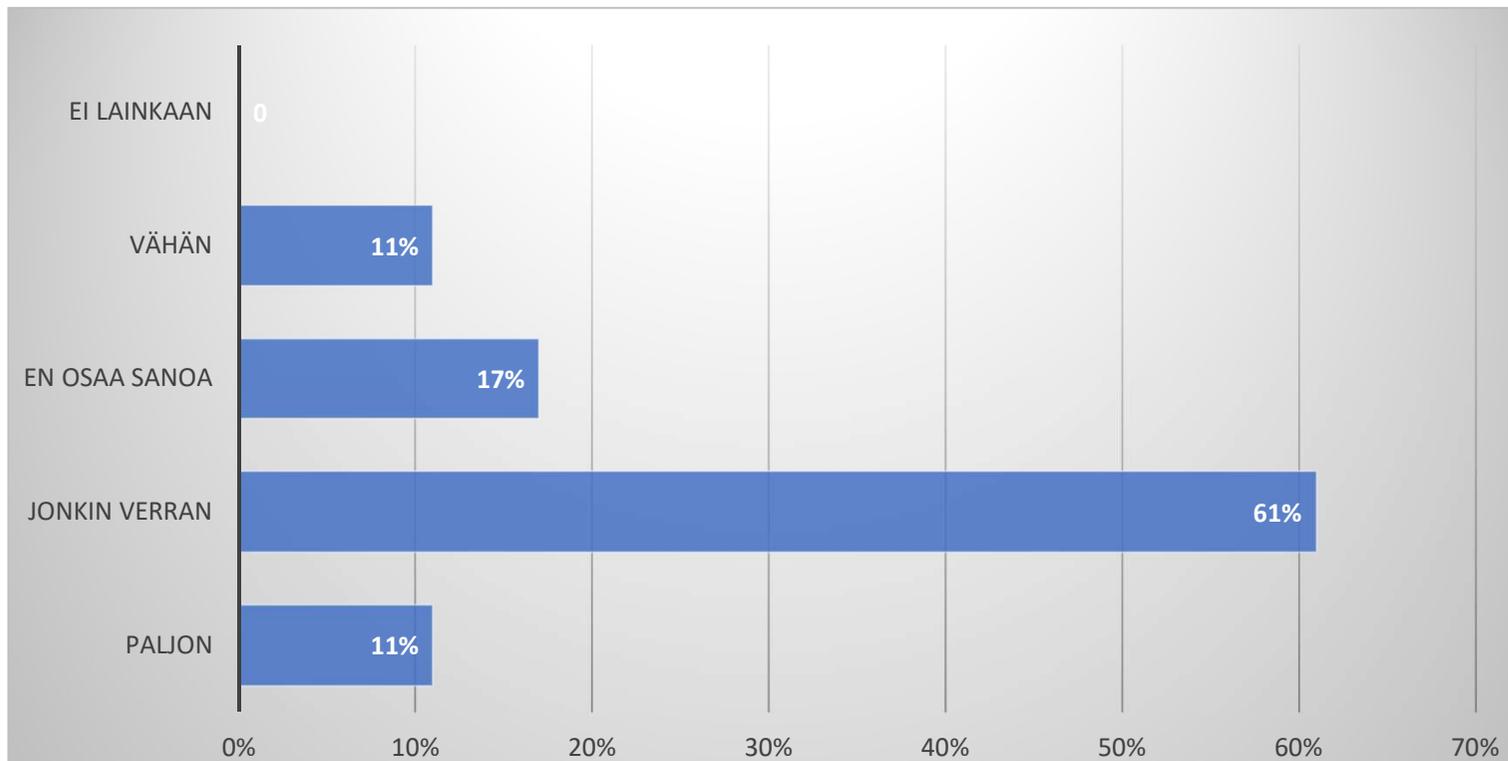
The assessment tools invented in ACTS-project help the teacher to support the development of children's thinking

Allmost 70 % of the participants believe that the tools could help the teachers to support the development of children's thinking



The assessment tools I tested (from ACTS tool selection) assessed children's thinking

Over 60 % thought the assesment tools they tested were useful while assesing the thinking

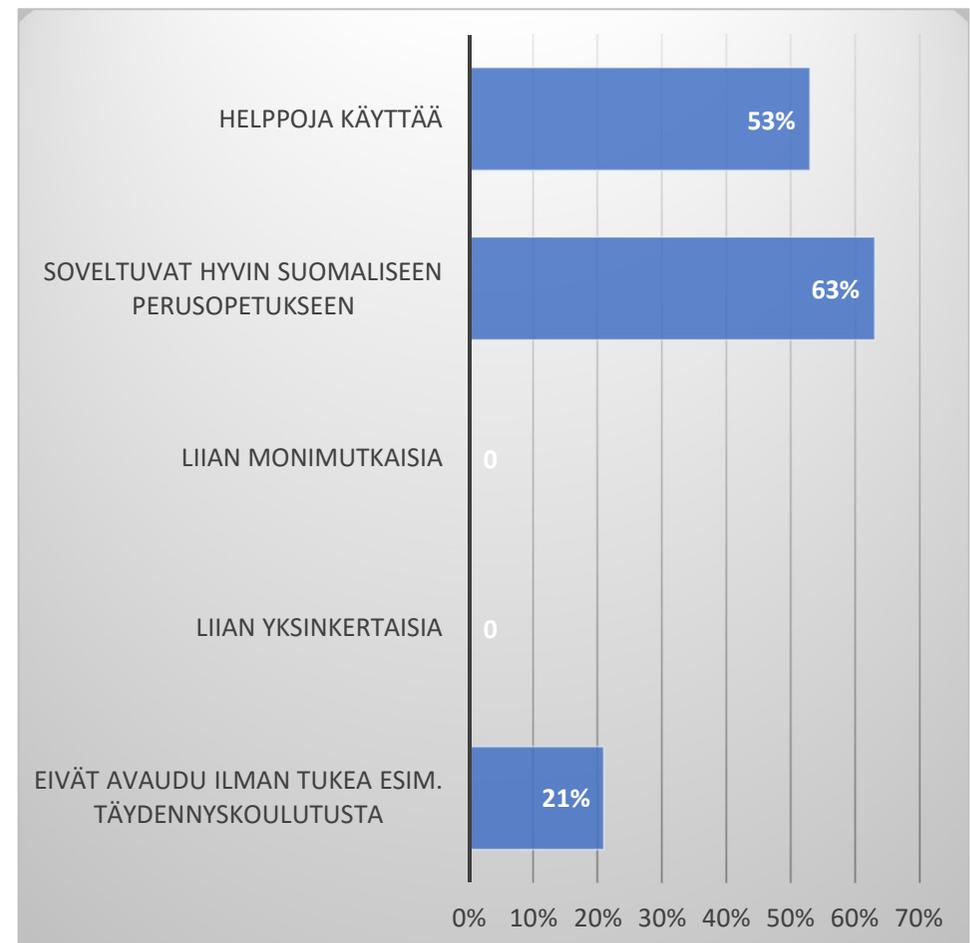


Mostly used:

- 1.The rainbow-poster
3. Smiling faces with Bloom-sentences
3. Clouds with Bloom-verbs
3. Sentences based on FNCBE
4. Yes/No-game

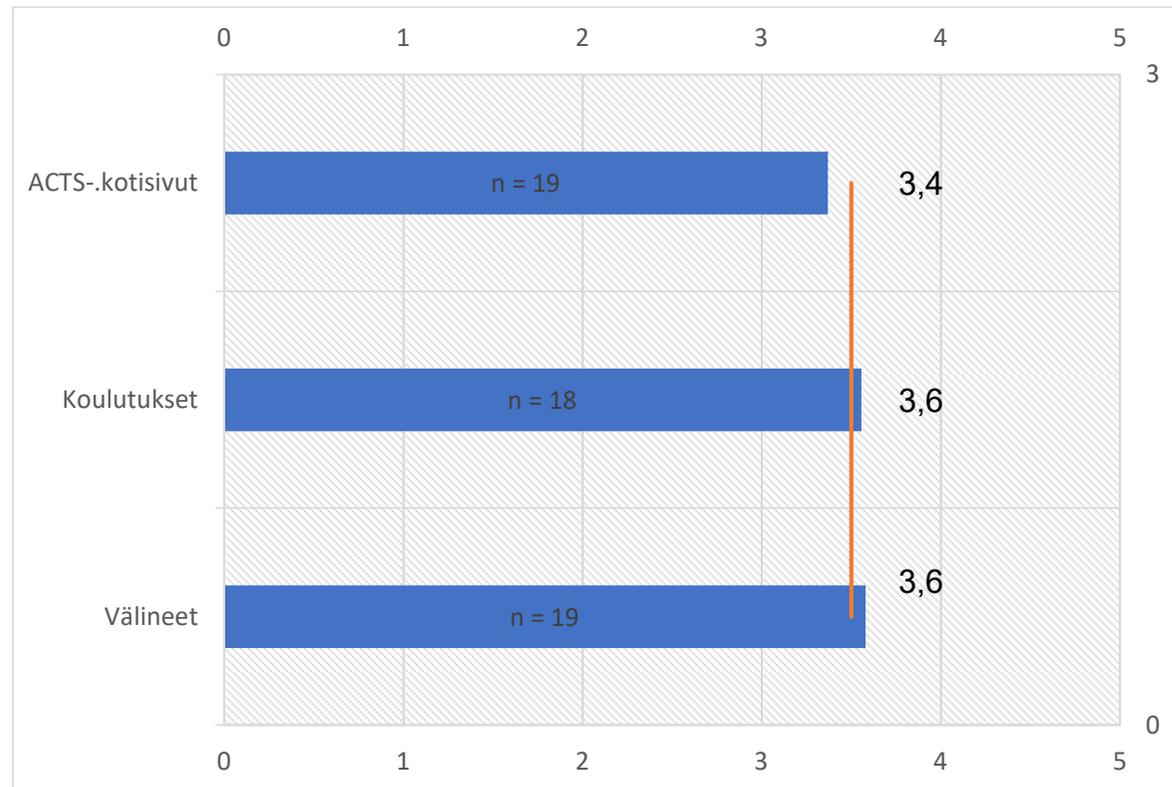
The tools invented in ACTS-project

1. are easily incorporated to Finnish primary education (63 %)
2. are easy to use (53 %)
3. are not useful without further education (21 %)



**Grades for the webpages, further education and the tools
(1=not at all useful, 2=useful to some extent, 3=quite useful,
4=useful, 5=very useful**

**The overall grade for
the webpages, further
education and tools
was about 3,5**



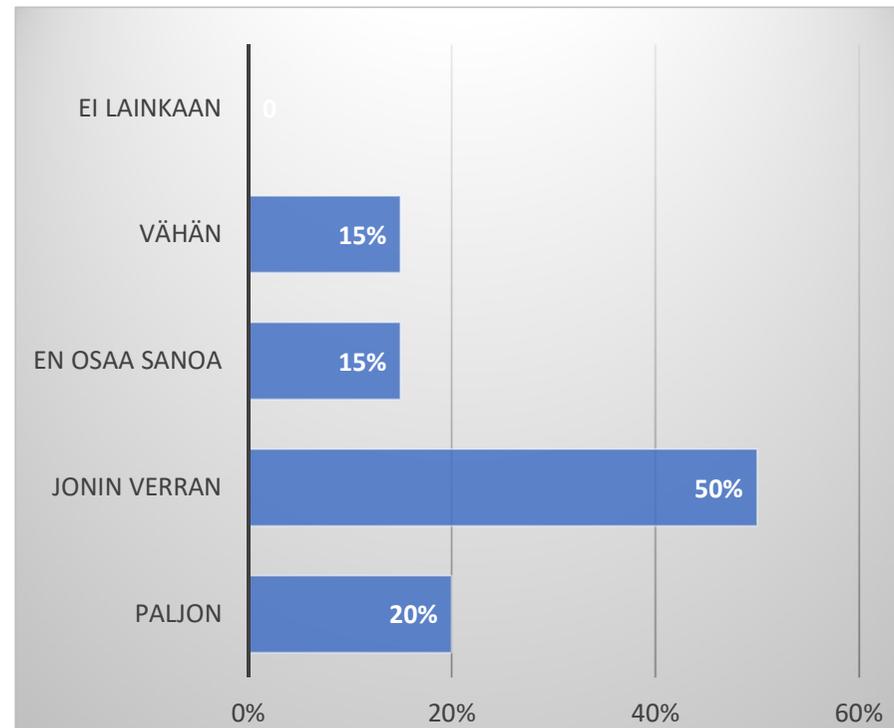
Plans for using the tools after the intervention

70 % of the participants will be using the tools to some extent (50 %) or a lot (20 %)

The teachers responded to all questions a bit more positively than the teacher students.

The biggest difference was that the teachers were more convinced that

1. the tools are in accordance to Finnish National curriculum
2. the tools are effective in assessing children's thinking



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Data collection, analysis and aims

DATA

The data is collected from the participants of second phase testing (N=10)

The teachers (N=5) are from different parts of Finland and some of them participated to the further education online.

The studentteachers (N=5) were involved in teachertraining in Teacher training school in Rauma. One tested the tools as a substitute teacher.

DATA COLLECTION

The data was collected via semi-structured interviews during summer and spring in 2019 after the second phase.

The interviews were conducted by Aerila and all the interviews lasted 50 – 60 minutes.

The interviews were transcribed by a company specialized in transcribing.

DATA ANALYSIS

The data was analyzed via qualitative content analysis mostly data-driven

The reliability of the analysis was supported by the fact that the analysis was driven by two researches individually and the analyses were compared.

THE AIMS

The aim of the analysis was to answer the following questions:

1. How did the teachers and their students benefit the ACTS-tools based on teachers observations?
2. What is the relevance of these tools from the perspective of the Finnish teachers?

Observations on the usefulness of the ACTS-tools

According to the data the ACTS-tools during the interventions help

- making students' thinking visible
- teacher to understand and react to the thinking levels and teaching of the students'
- the students to verbalize and reflect their thinking
- the teacher to develop children's thinking

- TEACHER 1: "You can observe where the student goes with his thoughts. So I am able to see how they think. I can easier create tasks for their level and tasks that correspond to their skills and needs."
- STUDENT 1: "I realized that it is important to tell the children what we are doing so they are able to realize what they should do. They were better focusing on the tasks and they also knew the aims of tasks."
- TEACHER 3: "They were able to put their own mark on the rainbow and justified it. –"
- TEACHER 5: "Yeah, I would say, that I cannot know what kind of thinking the children use in my lessons. Using the tools, I can say that his/her thinking was on a higher level than I thought or my understanding of children's thinking started to clear up."

BLOOM'S TAXONOMY in TEACHING MATERIALS

- Very little, if any
- Textbooks are poor/unusable in relation to thinking skills

TEACHER 1: "Sometimes there is but mostly not. If you think of your learning materials that way, there is very bad learning materials. -- They underestimate kids."

TEACHER 5: "Well, very few educational material really show it. It is a bit glued at the moment. It is not something that you can really see and know what it is."

STUDENT 2: "Yeas, and teachers are trying to accomplish easily and only use the ready materials even if they are not good."

Teachers' knowledge on Bloom's taxonomy

- Teacher's do not feel that they master the Bloom's Taxonomy
- Teacher feel that they do not have knowledge of the levels of Bloom's taxonomy and the idea behind the taxonomy
- Teacher cannot use Bloom's taxonomy in their own work, it takes time (both in lessons and while preparing the lessons)
- The teacher training institute would need to concentrate more on Bloom

- STUDENT 2: "Well, at least now, I learned a lot of new things."
- STUDENT 2: "Now it become concrete that Bloom was combined in our curriculum. Now I understand what it means."
- TEACHER 1 " How well I master it? Probably partly. Maybe I have always tried to support the thinking skills, I mean that I have always tried to activate my students to thinks. But now I can see that teacher can be lazy sometimes."
- Student 3: Probably as a concept but if you say I have to open those levels I could not do that. I think that if u mess up the words and ask some random teacher to explain those, I think she/he can not do that."

Is remembering thinking?

- Teachers highlight that it is the base where to build on
- However, it is not thinking if the teacher pours the information on students
- Remembering is thinking when a student does it independently. In other words uses the things he/she remembers.

STUDENT 2: "Yes, but on the other hand, in order to be able to remember you need also thinking skills. You need some connections so you can combine the learned detail to your memory. I mean that you need to also think if you want to get some information from long-term memory."

Teacher's reasons for teaching or not teaching thinking

- It means a lot of work to make the student think
- It takes time away from other things
- + It makes children's reasoning skills better and it has an effect on thinking development
- It does not happen on its own, it means a lot of encouraging and guiding children to think
- + It only means giving time to think
- Teacher does not necessarily have the skills to develop or teach through thinking

STUDENT 1: "– When you did not rush them and give time to think and accepted every answer it encouraged students. On the other hand it takes time away from other things."

TEACHER 3:" I am very interested in different ways of working. I try to make different worktypes for students so they can use different kind of thinking"

TEACHER 4: I use a lot of content questions . I try to teach through understanding. We have had this science class where thinking skills have been kind of hidden idea. In science classes students can wonder and think.

Teacher's views on children's thinking

- In many cases , the children do not want to think at schools
- The teacher has to do the work to get them think
- School underestimates children's capability and supports the inactivity of children
- Thinking often requires a lot from children
- It is impossible to assess the child's thinking if they are silent and sit still.
- The background and personality of children affects children's thinking

- TEACHER 1: "Some of the kids are lazy thinkers."
- TEACHER 1: " Some of the kids love to think, some does not. It is nice to concersatet with the good thinkers."
- STUDENT 1: " Children's thinking dependson what kind of activities there is at home. The level of language affects on thinking, the starting point defines the thinking."
- TEACHER 3: "There is big differences between children. Mabe the difference comes from home."
- TEACHER 4: " And there are those kids who obviously do not know how to think and they say I do not remember."
- TEACHER 4: " Yes it is probably a personality issue and it defines how much you think. There are students who want to think and student who does not."
- TEACHER 5: Well, childrens may not think quite voluntarily when it requires lwork. So my work is to engourage them to think."

CONCLUSIONS

1. The tools helped **the teacher** to focus on the thinking of children and to the content and activities in lessons.

2. The tools increased the motivation of **the teachers** to create activities and content which helped the students to assess their thinking and use variety levels of thinking skills.

3. **The teachers** learned the meaning of Bloom's taxonomy.

4. **The teachers** become more aware of their own teaching from the perspective of children's thinking.

1. **The children** got tools to actively assess and think about their thinking

2. **The children** were talking about thinking with their pairs and the teachers

3. **The children** learned vocabulary to verbalize their thinking

4. **The children** became more aware of the thinking and the different forms of thinking.

DISCUSSION

The results are mostly in accordance to the prior research f.e. Hattie & Yates, 2014: So just why is thinking not much fun? For a start, it requires effort. Human beings are naturally resistant to squandering resources whenever effort is involved.

Willingham, 2009: --in accounting for why students do not like school, is that the human brain does not naturally want to think

- In Finland teacher still bases his teaching on textbooks
- The teachers often want to do things the easiest way
- The national curriculum and the Bloom's taxonomy behind it are still a bit unclear to teachers (in our interventions the teachers were the motivated)
- Tools and pedagogical approaches to different perspectives to thinking are needed
- The teachers seem to think that certain subject contain more thinking than the others

- The children are not used to think during school days
- The teachers believe that the level of a child's thinking is created in early childhood (home environment) and difficult to change
- Children are mostly in their comfort-zone and try to solve the learning problems with things in memory
- There are wide variety of the ability and willingness to use thinking in classrooms
- Family thinking practices?