Teachers’ emerging transformative agency in a Change laboratory (CL) project

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The aim
• To discuss an empirical example of what may be taken as indicators of participants’ agency in a change laboratory.

Background
• The Manilla school – a Swedish 10-year compulsory special school for children that are deaf or have severe hearing impairment and/or a cochlea implant.
• Researchers were invited as students’ achievement were so poor that the school was in danger of being closed by national authorities.
  – Specific communication conditions: All 7 maths teachers were involved. 4 of the teachers were deaf, 3 were hearing but signing. Both researchers and teachers were dependent on sign interpreters, which constrained the physical environment – all had to be able to see them. Sign interpreters mathematical knowing was related to everyday language.
• Change Laboratory in the Manilla project was used as a subject didactical tool in order to develop math-teaching.
The relation researchers-teachers

• Main idea of a change laboratory:
  – To collectively develop or change the participants’ activity → to expand the object.
  – To build and sustain the participants’ transformative agency in a CL is a central task for the interventionists (Virkkunen 2006).

• Role of researchers (interventionists): to provoke and sustain the participants’ work (Engeström 1987, 1996).
  – These ideas indicate that participants conceptually share responsibility in the process (see Eriksson, 2015).
  – However, participants are dependent on researchers, since they produce & select mirror data and identify contradictions.
The principles behind the Change Laboratory
(Virkkunen & Newnham 2013 p 10)

<table>
<thead>
<tr>
<th>Focus</th>
<th>Problems</th>
<th>Solutions</th>
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<tbody>
<tr>
<td><em>Invisible systemic structure of the collective activity</em></td>
<td>1. Identifying the obvious (visible) problems</td>
<td>3. Finding a way to overcome the problems by expansively reconceptualising the idea of the activity.</td>
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<td></td>
<td>2. Disclosing the systemic causes of the visible problems in the activity.</td>
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<td><em>Immediately visible events and problems in individuals’ actions within the joint activity</em></td>
<td>4. Taking new kinds of actions: implementing new instruments, rules, ways of dividing labor and collaborating.</td>
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Researchers

• In-depth analysis of mirror data in order to find e.g. historical contradictions.

Participants experiences

• Participants who experience challenges often try different solutions without such analysis.
  – Risk: changes tried out are mainly based on easily visible/obvious problems. But that which seems visible may only be signs of problems grounded in systemic causes.
During the workshops Engeström’s Expansive Learning cycle was used complementary to the “Nine-chart” table.

Organisation of work

- The content of the workshops roughly followed the different phases in Engeström’s (1987) model of expansive learning cycle.
Tools for interventions

• The Nine-cell table
• Davydov’s principles for Learning activity
• Epistemic metaphors related to
  – the Swedish national curriculum and
  – the syllabus for mathematics
## "The Nine-cell table" (source: Virkkunen & Newman 2013, p 18)

<table>
<thead>
<tr>
<th>Model/vision</th>
<th>Ideas/tools</th>
<th>Mirror</th>
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</thead>
<tbody>
<tr>
<td><strong>Future</strong></td>
<td>7 Visioning the future structure of the activity system in which the current contradictions would be overcome.</td>
<td>8 Modelling the new tools and ways working necessary for realizing the vision. Designing first experiments with the new tools and new ways of working.</td>
</tr>
<tr>
<td><strong>Present</strong></td>
<td>6 Modelling the most important changes taken place in the elements of the activity system as well as historically evolved inner contradictions the changes have created within the activity system.</td>
<td>2 Shared concerns, identified problem areas in the joint activity. Ideas for further analysis. Solution ideas to identified problem.</td>
</tr>
<tr>
<td><strong>Past</strong></td>
<td>5 Modelling the central features of the past structure of the activity. Analyzing the nature of the current phases of the transformation of the activity.</td>
<td>4 Identification of periods and turning points in the development of the activity.</td>
</tr>
</tbody>
</table>

1. Samples of problem situations in the practitioners daily work with the object of the joint activity (for instance disturbances and ruptures in serving clients or in central processes of the joint activity). Videos, interviews, documents.

2. Shared concerns, identified problem areas in the joint activity.

3. Data concerning important historical changes in the activity system.

4. Identification of periods and turning points in the development of the activity.

5. Modelling the central features of the past structure of the activity.

6. Modelling the most important changes taken place in the elements of the activity system as well as historically evolved inner contradictions the changes have created within the activity system.

7. Visioning the future structure of the activity system in which the current contradictions would be overcome.

8. Modelling the new tools and ways working necessary for realizing the vision. Designing first experiments with the new tools and new ways of working.
Indicators of participants’ developing agency?

• We argue that
  – the issue of agency – both relational and transformative – is of great importance in a CL but that sustaining participants’ agency is a demanding task.
  – participants’ agency must be analysed empirically

Research question

• What could be taken as indicators of participants’ developing agency?
Data production

• The data were produced during a change laboratory (CL) in mathematics at the Manilla school in 2014-2015.

• Interview based on the idea of “Collective remembering” (Konkola 2002) about the school with 9 teachers, some retired others active, representing various subjects and experiences

• Video-recorded CL-workshops

• Teachers’ notes from their work between workshops

• Video-recorded lessons, by teachers
IDENTIFIED INDICATORS:
TWO EXAMPLES
The nine-cell table and the cycle transformed into educational developmental tools

• Once the teachers found out that their teaching did not match the intentions of the curriculum, they started working with task design in line with the principles developed during the workshops (e.g. Davydov’s learning activity)
  – Would the teacher continue working after the Change Laboratory?

• The teachers not only aimed for continuing the task-designs but they had also transformed the nine-cell table and the expansive learning cycle into tools for developing math-teaching in new content areas.
  – During the project we as interventionists had seen these tools as a mean to orient us where in the process we where at different times and what type of work we had to do.
Concluding remarks

• The teachers transformed the two tools (the nine-cell table & the model of the expansive learning cycle) into professional tools for guiding their designing, testing, evaluation and implementation of new ways of teaching mathematics. They had experienced the value of analysing their contemporary teaching and assignments in relation to what knowledge they wanted their students to develop.

• Finding contradictions and challenges was also seen as an important aspect in order to find e.g. new assignments. They also talked about the importance of evaluating and Disseminating their findings.
THANK YOU!