Curriculum mapping; the linking pin between educational resources or a Procrustean bed?

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Who are we?

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Specifically, who is Jos Tolboom?

- **1991-2001**
  Teacher secondary education, mathematics and computer science

- **1997-2010**
  Lecturer tertiary education, mathematics and mathematics education

- **2010- now**
  Curriculum developer mathematics, Netherlands Institute for Curriculum Development

- **J.Tolboom@slo.nl**
What did we do?

We tried to map the Common Core State Standards Mathematics on the specified core objectives for Dutch lower secondary mathematics education. The case study shows the yields from, and unveils the difficulties that are associated with curriculum mapping.
Curriculum mapping?

- Exists since the 1970’s (Fenwick, Goodlad)
- But usually within one specific curriculum, from abstract to concrete

<table>
<thead>
<tr>
<th>INTENDED</th>
<th>Ideal</th>
<th>Vision (rationale or basic philosophy underlying a curriculum)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Formal/Written</td>
<td>Intentions as specified in curriculum documents and/or materials</td>
</tr>
<tr>
<td>IMPLEMENTED</td>
<td>Perceived</td>
<td>Curriculum as interpreted by its users (especially teachers)</td>
</tr>
<tr>
<td></td>
<td>Operational</td>
<td>Actual process of teaching and learning (also: curriculum-in-action)</td>
</tr>
<tr>
<td>ATTAINED</td>
<td>Experiential</td>
<td>Learning experiences as perceived by learners</td>
</tr>
<tr>
<td></td>
<td>Learned</td>
<td>Resulting learning outcomes of learners</td>
</tr>
</tbody>
</table>

So, our job was a matter of *inter* curriculum mapping, instead of *intra* curriculum mapping
Aha, nice job. But why would you?

- Open Educational Repositories are filled with Open Educational Resources
- An example of an OER: The Kahn Academy
- KA does some metadating on its content
- Especially with respect to the CCSSM
So there is a potential?

• In our view: yes, there is!
• Basic question is the same as the one of all educational repositories:
• **How do we unlock and optimally re-use existing content?**
How did we work?

• CCSSM was our starting point
• We sought for equivalents of the items as described in CCSSM in ‘Tussendoelen wiskunde’ (as a part of the Educational Concepts Framework (Dutch: ‘Onderwijsbegrippenkader’))
• We classified the relationship between both descriptions from a mathematical perspective
Target of this presentation

- To sketch our experiences during the inter curriculum mapping
- To formulate some preconditions that could foster progress in this field
What kind of relationships were possible?

- X: CCSSM
- Y: OBK-M
What did it look like in practice?

- Results mapping CCSSM -> Educational Concepts Framework Maths

- How did we classify the quality of the specific relationships?

- In two ways:
  - ISO5964 equivalences

- Both ways seemed reasonably positively correlated
On ISO5694 equivalences

- **Exact fit** = good; core corresponds well as the degree of 'specificity'. Sometimes inexact probably just as well. The mapping is never completely 1 to 1.
- **Inexact** = fits reasonably, but there are (also) other terms.
- **Partial** = fits partially. Is frequently used, in particular if CCSS is more specific than OBK (eg a specific approach contains). Also used as CCSS covers only a part of OBK.
- **SingleToMuliple** = a difficult to understand and use designation. Easy to confuse with Partial. Selection is made on this only when it is very clear that the two or three subjects mapped along an (in) exact match shapes with the CCSS.
- **NonExact** = Was discussion about, is sometimes used to indicate that the content which the CCSS relates in NL in different grades common than in NL.
On the process of inter curriculum mapping

- Both curricula used a different curricular grammar
- Eg: CCSSM used verbs in order to describe student actions. Sometimes that specific, it seemed like didactics
- Which meta data categories are used?
  - E.g.: grades. Seems logical. But in Dutch secondary there is a rather fast split up in educational streams
- Success or failure of any excercise in this field: end user satisfaction
- Use their remarks on their experiences for backwards designing the curricular starting points
Why would mathematicians all over the world understand each other...

...and curriculum developers mathematics would not?
You were such a lovely audience!