

KØBENHAVNS UNIVERSITET Institut for Naturfagenes Didaktik



## Open lessons and the teaching profession in Japan

DTU/DMUK 13/11 2012



Dias 1

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Based on a series of joint papers w/ T. Miyakawa, including:

Didactical designs for students' proportional reasoning: An "open approach" lesson and a "fundamental situation". *Educational Studies in Mathematics* **72** (2), 2009, 199-218.

Japanese "open lessons" as institutional context for developing mathematics teacher knowledge. In M. Bosch Casabo, et al., *Un panorama de la TAD*, pp. 405-414. Barcelona : *Centre de Recerca Matemàtica*, 2011.

Developing mathematics teacher knowledge: the paradidactic infrastructure of "open lesson" in Japan. To appear in *ESM*.

Many more ref.s at [www.ind.ku.dk/winslow](http://www.ind.ku.dk/winslow)

Dias 2


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### What is an open lesson (*koukai-jyugyou*)?

**Objective**  
Develop mathematics teacher knowledge through observation and discussion of practice (lesson)

**Organisation**

1. Public lesson with a lesson plan made available to the observers
2. Reflection meeting after (same room)



**Levels**  
in Japan: inside the school (teachers, parents,...), in a municipality or prefecture, national lesson festivals...

**Q1 : What happens in practice – what is discussed?**  
**Q2 : What consequences for teachers' professional knowledge – and for their profession?**

Dias 3



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### Research project

Data from observation of open lessons :  
lesson and reflection meeting (video, transcription+ -lation)  
lesson plans, related materials (e.g. text books)

Analysis of selected "open lessons"

- The lesson itself: mathematical and didactic praxeologies
- Reflection meeting:
  - *Paradidactic praxeologies*  
teachers' practice and knowledge "outside classroom"
  - *Paradidactic infrastructures*  
Institutional conditions and affordances of open lessons





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## An example

School festival, June 2009

- Primary school attached to Joetsu U.
- Held every year at this school (Friday+Saturday)
- 70 open lessons in all subjects, in two days
- 700 guests in 2009 (from all of Japan) – teachers and...
- All aspects of the school life on display, but the primary aim is to share and develop knowledge for teaching




Dias 5

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## The lesson

- Grade 2 (students about 7 years old), 40 students
- Lesson no. 16 in a series of 17 lessons, duration 65 mins
- Series title: *Sukkiri* as we draw!  
(sukkiri ≈ experience of clarity, « aha »)
- Japanese « open approach » (Nohda, 2004)
- Task : find solution and make a drawing which, to a group of students, give « clarity » (of solution and method, and on who are convinced of what and why)



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## Video 1



What is the mathematics at stake?  
What techniques are used by the teacher? Why?  
What techniques are developed by the students?

novembre 12

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## A mathematical task, wide choice of techniques

Task

- $[t_0$  : to formulate  $t]$  [didactic technique]
- $t$  (the task) : There were 16 persons on a bus. Later, more people got on, so there were 34 in total. **How many had got on the bus ?**
- $T$  (type of task) : Given a total  $N$  and a part  $A$ , find rest  $B$  ( $N = A + B$ ; given  $N$  and  $A$ , find  $B$ ).

Techniques

- $\tau_0$  : identify numbers (16, 34); choose the right operation (+/-); execute (results:  $16+34$  or  $34-16$  or ...)
- $\tau_1$  : represent situation symbolically and solve ( $34 = 16 + \text{rest} \Rightarrow \text{rest} = 34 - 16$ ).
- $\tau_2$  : represent situation by a drawing (abstraction from concrete situation) showing situation and solution « in one » (as opposed to arithmetic/algebraic approaches).

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### Drawings of the ten groups

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### Teachers' notion: senbun-zu (line diagram)

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### Line diagrams in text book (of the class)...

1 2つの計算をくらべましょう。

① ㊦ 子どもが 8人で  
あそんでいます。4人  
きました。みんなで  
何人になりましたか。

8+4=

② ㊧ 12人の子どもが  
あそんでいます。4人  
かえりました。のこっ  
ているのは何人ですか。

12-4=

novembre 12

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### Video 2 : reflection

- Excerpts from 1h meeting
- Panel: chairman (teacher from other school); the teacher; « knowledgeable other » (prof. from Joetsu U.)
- Participants: teachers, teacher students, school managers, university researchers (math./math.ed.), text book publishers, etc.

Now let's take a look at how the discussion unfolds  
- Just to get a rough impression of « teachers' voices »

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**In Japan, two types of paradidactic infrastructure: KONAIKENSHUU and KENKYUKAI**

*Konaikenshuu* refers to the *study and research* of teachers *inside the school*

Teachers' knowledge is shared across institutions by publication of reports, lesson plans, magazines, books, videos... and by participating in *Kenkyukai* (research meetings)

Example: dictionary of mathematics teacher terms (200 pp)

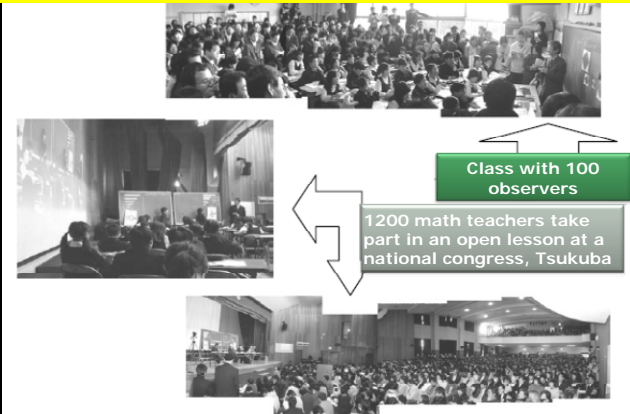


校内研修, teachers' « scholarship at school » to develop their professional knowledge

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**KENKYUKAI: sharing teachers knowledge across institutions (e.g. in an open lesson)**



Class with 100 observers

1200 math teachers take part in an open lesson at a national congress, Tsukuba

Isoda et al. : Japanese Lesson Study in Mathematics (2007)

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**On the teaching profession**  
(Stigler & Hiebert, *The teaching gap*, 1999)

*The perception that teachers are not up to the task of improving teaching and solving the country's educational problems is often captured in one short phrase: "Teachers are not professionals". To combat this attack, some defenders have launched a counteroffensive. Teachers, they say, are unfairly blamed for students' failures... Because teachers are not fully appreciated for what they do, they are vulnerable to public attacks. To solve this problem, say their defenders, society should demand that teachers be given higher status and be treated as real professionals. (...) They presume that attributing to teachers the characteristics common to professionals in other fields will bring higher status and respect.*

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**On the teaching profession (2)**  
(Stigler & Hiebert, *The teaching gap*, 1999)

*We believe, however, that attacking the problem simply by arbitrarily assigning professional characteristics to teachers mistakes the trappings for the profession. In fact, a profession is created not by certificates and censures but by the existence of a substantive body of professional knowledge, as well as a mechanism for improving it, and by the genuine desire of the profession's members to improve their practice.*

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