FASMED

Torsdag 16.april 2015

SCHEDULE THURSDAY APRIL 16 2015

0915-0945 Follow up sessions at Birralee (continuation from our observed lesson) and Saupstad (redesigned lesson from Strindheim).

0945-1015 About redesign: different approaches and possibilities.

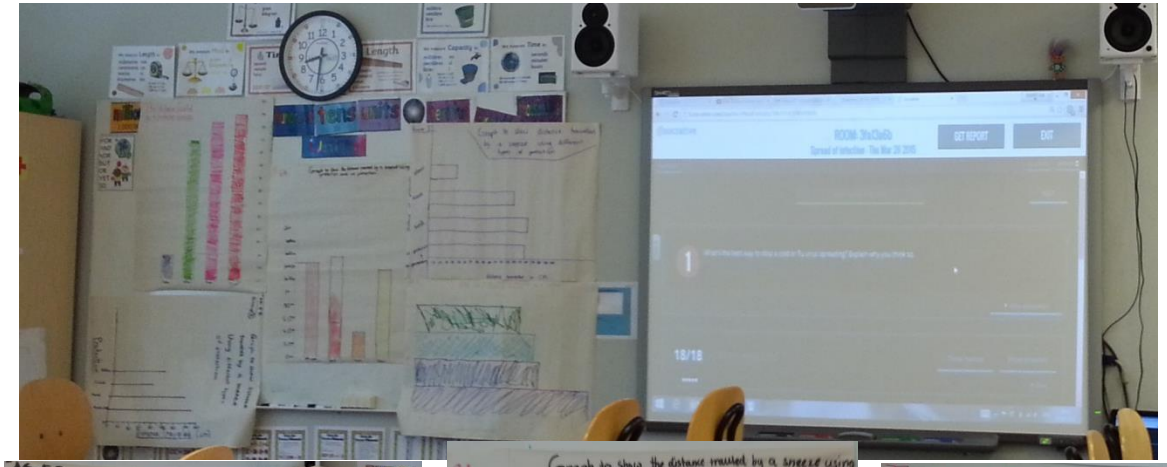
1015-1045 Planning ahead. Last weeks of the spring, and the autumn semester. Including redesign of lessons, group interview with students.

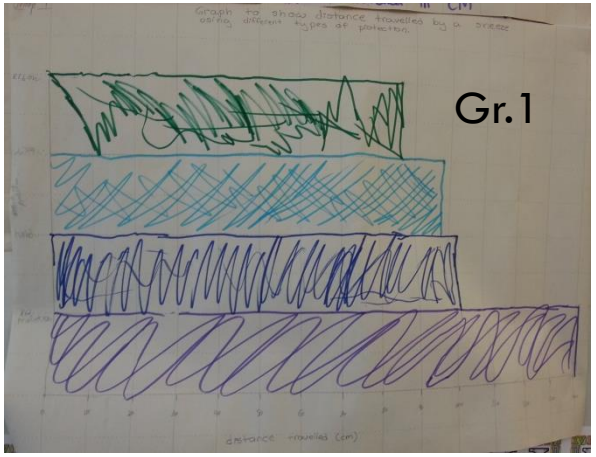
1045-1100 Break 1100-1145 Redesign of the Birralee session for use at Strindheim.

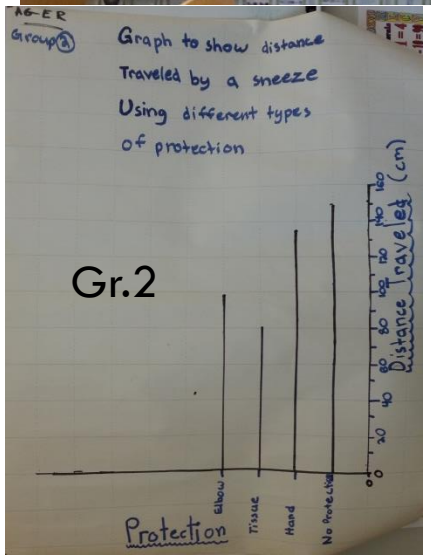
1145-1230 Demonstration and use of the software Desmos.

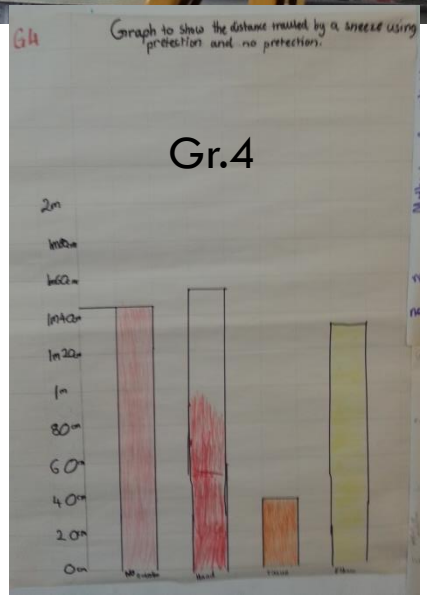
Birralee, 27.03.15, ready for start

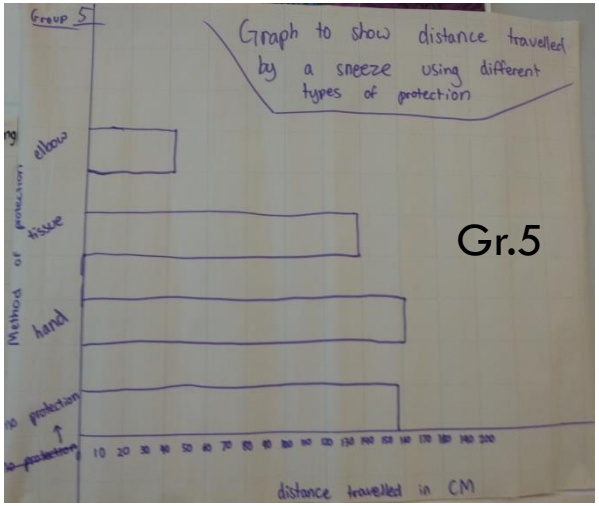
30 min lesson, 18 children, no assistant











-start, remind the topic

-One of the graph explained by a child (in front of whole class)+discussion

-Fair test + how to improve “tissue” performance + different ways of data gathering → different results

-Socrative: Follow-up of children’s answers. Agree most, disagree most. Pupils wrote on white board

-White board (WB): not only for teacher to see ind. answer, but also for pupils to have answers ready (random pick-up, whole class discussion)

FASMED
REDESIGN – INNFALLSVINKLER OG MULIGHETER

Torsdag 16.april 2015

LESSON STUDY SYKLUS

1. felles planlegging av en undervisningsøkt;
2. gjennomføring av undervisning ved ett medlem i gruppen mens de andre observerer, noen ganger videofilmes det;
3. refleksjoner og diskusjoner etter økta.

Redesign

1. felles planlegging av en undervisningsøkt;
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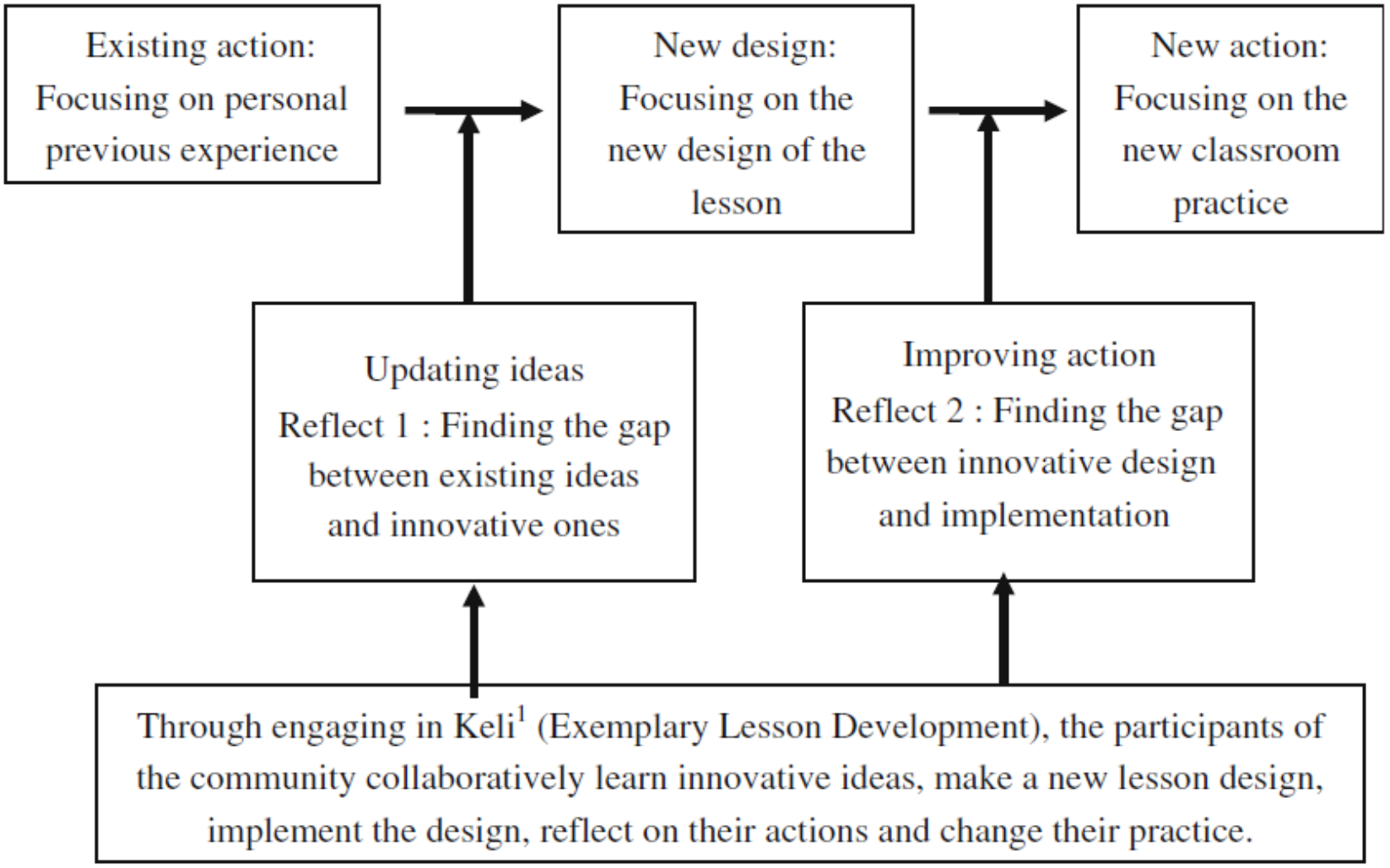

Figure 1. The Keli Model: A fundamental process for implementing *Xingdong Jiaoyu* (Action Education) (from Gu & Wong, 2003).

REDESIGN LANGS ULIKE AKSER

Motiver for redesign

1) Kvalitet og læringsutbytte
2) Rasjonalitet og tidsbesparelse
3) Motivasjon
4) Variasjon
5) Spin-off / hjemmearbeid

Typer redesign

a) Annen teknologi
b) Andre eller endrede aktiviteter
c) Nye eller endrede læringsmål
d) Endrete læringsspor
e) Variasjoner rundt faglig tema

REDESIGN: ULIKE MOTIVER

1) Kvalitet og læringsutbytte: det ble observert at elevene ikke fikk det læringsutbyttet som en hadde forventet, eller en ble enige om at kvaliteten kunne forbedres i deler av opplegget

Undervisningskvalitet + Formativ vurdering = Den pedagogiske bruken av verktøyet

Konkurranse – Ikke konkurranse (Ytre indre - motivasjon)

Virkelig dialog – Monolog (Phil Scott et.al. og dialogen)

Instrumentelt (kokebok) – Åpent

Spørsmål - svar

Åpne – lukkede (Scott, Mortimer & Ametller)

Ja-Nei, To - flere svaralternativer.

Grafisk – tekstlig, muntlig – skriftlig

REDESIGN: ULIKE MOTIVER

2) Rasjonalitet og tidsbesparelse: deler av aktivitetene tok for mye tid i forhold til utbytte
3) Motivasjon: forsøke å øke elevenes motivasjon gjennom å gjøre noen grep
4) Variasjon: mer variasjon i arbeidsmåter eller variasjon rundt begrepsinnholdet elevene skal arbeide med
5) Spin-off / hjemmearbeid: det viste seg at noe av arbeidet like gjerne kunne legges til hjemmelekse eller bruke hjemmeressurser
   - Bedret motivasjon?
   - Bedret konsentrasjon?
   - Hjemmebruk med Apper – kostnader?
   - Spart tid? (rasjonalitetsargument)

REDESIGN: ULIKE TYPER

a) Annen teknologi: bruke Socrative istedenfor Kahoot. Whiteboards istedenfor SRS. Grafprogram istedenfor plotting for hånd.

b) Andre eller endrede aktiviteter: hva er best egnet for å få fram den viktigste ideen i timen/ best for å avdekke eventuelle misoppfatninger. Kan noe være mer elevaktiverende? Trengs det mer lærerstyring?

c) Nye eller endrede læringsmål: spesielt hvis redesign er for et annet klassetrinn

d) Endrete læringsspor: rekkefølgen på aktiviteter, oppgaver, spørsmål, hva som skal fokuseres

e) Variasjoner rundt faglig tema: anvende variasjonsteori for å få fram 'the big idea' i timen

EKSEMPEL: OMKRETS OG AREAL AV REKTANGLER OG SAMMENHENGEN MED PRODUKTET AV TO TALL

1. *The starting activity: The teacher asked students to use four numbers 1, 3, 4, 5 to combine two two-digital numbers, and then to guess which of the two to multiply to get the largest result.*
2. *The main activity: The teacher asked students to cooperate in a group of four students and to respectively use 20 and 18 matches to form rectangles and to record the possible length, width and area of rectangles with the constant perimeter on the worksheet. Students were also asked to use mathematical language to represent their findings on a worksheet.*
3. *The exercise activity: One of the tasks in this activity was to ask students to find the larger product of 94×83 and 93×84.*

THE REFLECTION

In primary mathematics, this content is considered as a typical topic to learn how to establish a mathematical proposition. Strictly speaking, it is not about concept learning, but about proposition learning, that is learning how to find laws and relations in mathematics. (input from expert teacher)

Suggestions: *start the lesson by using a smaller number of matches, max 10, so as to enable students with various levels of skills to handle the task within the available lesson time.*

The instructional activities should be redesigned to enable students to experience the whole reasoning process of (re)discovering the mathematical proposition (observation/operation – guesses – plausible reasoning / proving – using proper representations and language to represent the mathematical proposition)

THE REDESIGNED LESSON

1. *Starting activity: students were asked to use matches to form rectangles and then to record the length, width, perimeter and area of the rectangles in a table;*
2. *Follow-up activity: students could make guesses and reasoning about their findings and then confirm their own guess.*
3. *Conclusion of the activity: students should learn to use different representations (e.g., drawing, symbols, their natural language and mathematical language) to characterize and to simplify the mathematical proposition of the relationship of perimeter and area of rectangles.*

(Ding, Jones, Pepin, & Sikko, 2014)

EKSEMPEL: VARIASJONSTEORI

Typer variasjon:

- Begrepsvariasjon / Conceptual variation
- Prosedyrevariasjon / Procedural variation (Gu, Huang, & Marton, 2004)

Dette kan gi seg forskjellige utslag:

task variation, example variation, calculation method variation and exercises variation

EKSEMPEL: DIVISJON MED REST

Learning goal in teaching: To know the new concept of "division with remainder" and to develop an understanding of the fact that 'a remainder is always smaller than a divisor'.

Key teaching tasks:

Task 1. A problem of sharing 12 peaches by 3 monkeys.

Task 2.

(1) Sharing 13 peaches by 3 monkeys.

(2) Sharing 14 peaches by 3 monkeys.

(3) Sharing 15 peaches by 3 monkeys.

Task 3.

(1) Sharing 17 strawberries by 4 friends.

(2) Sharing 17 strawberries by 6 friends.

VARIATION: EXAMPLES, QUESTIONS

The teacher challenged students by a non-concept example '15÷3=4……3'. By comparing it with '15÷3=5', students were able to discern the fact that "a remainder should be smaller than a divisor".

Next, in *Task 3*, Mei purposefully requested students to explain why the remainder 5 is incorrect in '17÷4=3……5', while it is correct in '17÷6=2……5'.

It appears that the teacher's leading role in varying examples and questions is necessary here as it is not natural for young students to make it explicit of their thinking process of the fact that 'a remainder is ALWAYS smaller than a divisor' automatically establish on their own.

(Ding, Jones, Mei, & Sikko, 2015)

IKT OG LÆRING

Komplekst – komplisert – fortsatt vage resultater på evidens for læringsutbytte.

Varierer mellom fag, med metoder, utstyr etc. etc.

"In many of the studies showing an advantage for online learning, the online and classroom conditions differed in terms of time spent, curriculum and pedagogy. It was the combination of elements in the treatment condition (which was likely to have included additional learning time and materials as well as additional opportunities for collaboration) that produced the observed learning advantages. (p. xvii, italics in the original)"

(Means et al. 2009, in: Livingstone 2012)

ULIKHETER

Livingstone (2012) er videre redd for nye klasseskiller, og diskuterer hvordan det offentlige kan være med å skape like læringsvilkår for alle i en skole med mye digital teknologi.

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UTFORDRINGER

Pedagogiske

Organisatoriske

Tekniske

Tidsressurser (økonomi)

Kritiske grense (sårbarhet)

REFERANSER

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