



**NTNU – Trondheim**  
Norwegian University of  
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# **Using technology in new learning spaces to create a common focus in collaborative learning**

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# Collaborative learning

A specific kind of group work, in which students actively work together on the same task, where the intention is for the students to learn together.

Mercer, N, and Littleton, K. (2007), Dialogue and the Development of Childrens' Thinking. A sociocultural approach, Routledge, London

# The groups

- The teacher is in charge.
- New groups for every session
- 4 students per group
  - Social aspect
  - Learning environment
  - Better discussions

# Two different learning spaces



R2- auditorium and response technology

Flat classroom with interactive whiteboards

# R2- auditorium

Group stations:

- The students can connect their own device.
- Microphone and speaker.

**Easy to change from lecture to group discussion.**

**A “lecture” consists of a sequence of group discussions.**



# Good feedback practice

Nicol og Macfarlane-Dick:

A synthesis of the research literature led to the following seven principles:

Good feedback practice:

1. helps clarify what good performance is (goals, criteria, expected standards);
2. facilitates the development of self-assessment (reflection) in learning;
3. delivers high quality information to students about their learning;
4. encourages teacher and peer dialogue around learning;
5. encourages positive motivational beliefs and self-esteem;
6. provides opportunities to close the gap between current and desired performance;
7. provides information to teachers that can be used to help shape teaching.

# Student-response-technology and peer discussion

Time to think individually



Voting



Discussion with peers



Second voting



Closure

# Flat classroom with interactive whiteboards

- No option for lecture.
- Focus on student activity.





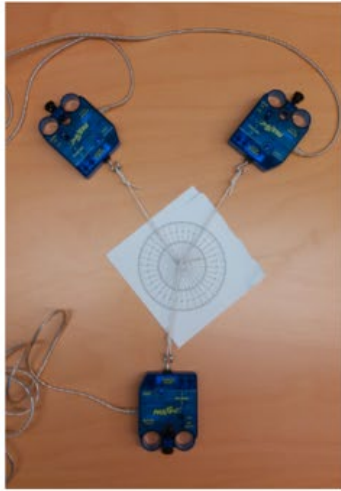
# Design for the interactive whiteboard



K15\_170320\_krefter - SMART Notebook

Praktisk oppgave: Summen av krefter

- Tre personer drar i hver sin kraftmåler.
- Snorsystemet skal være i ro.
- Tegn x,y-akser på gradskiven.
- Mål kreftene ("Digits" i Capstone) og vinklene.
- Dekomponer kreftene og regn ut  $\Sigma F_x$  og  $\Sigma F_y$

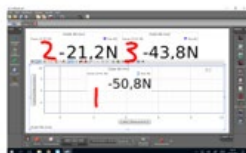


# Design for the interactive whiteboard

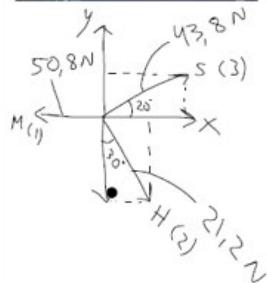


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1:  $270^\circ$   
2:  $150^\circ$   
3:  $70^\circ$



$$\begin{aligned} F_{xs} &= F \cdot \cos 20^\circ \\ &= 43,8 \text{ N} \cdot \cos 20^\circ \\ &= 41,2 \text{ N} \end{aligned}$$

$$\begin{aligned} F_{xH} &= F \cdot \sin 30^\circ \\ &= 21,2 \text{ N} \cdot \sin 30^\circ \\ &= 10,6 \text{ N} \end{aligned}$$

# Focus group interviews

The students' perspective and experiences:

- The interactive whiteboard.
- The group work process.
- The teacher's role.

Interviews done by Gabrielle Hansen, independent researcher.

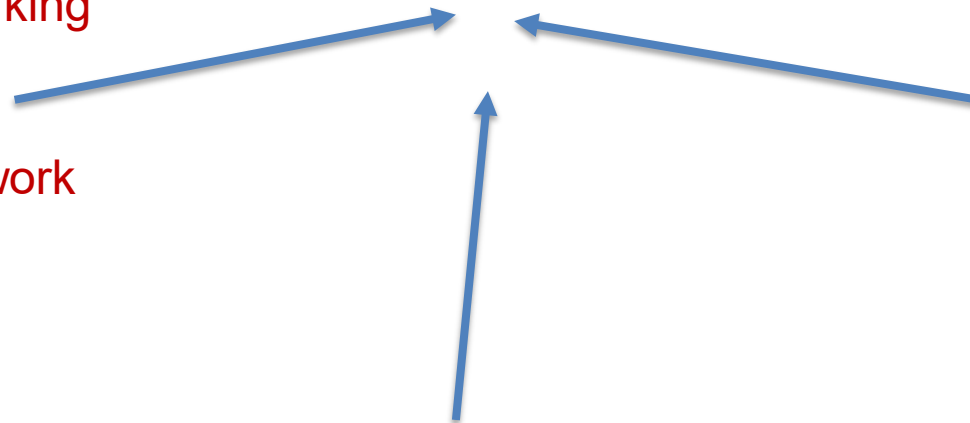
# The students' perspective

## - the interactive whiteboard



You look at the same thing, you are working together.

It makes people work together.



Everyone is paying attention to what is happening on the board, nobody is sitting at the corner of the table and calculating on their own.

The big board helps to see what is going on.

Yeah, and that everyone sees it. We do everything together.

# The interactive whiteboard supports joint focus in collaborative learning

**CHALLENGES**

It's a bit of a nasty feeling, you almost feel, misunderstand me correctly: *naked*.

You become very visible when standing there, it's completely impossible not to see you.

# The students' perspective

## - the group work process

You learn so much by explaining to others what you have understood, and to get an input on what you have not understood yourself.

If you meet a problem at home, it's easy to give up and do something else.

The threshold is a little higher when you are here and can get help from the teacher or other students.

It can be easier to understand when someone at your level talks about it rather than the teacher.

Also if you sit there and do not understand something, there are three “teachers” who can teach you in three different ways.

# The students' perspective

## - the teacher's role

The teachers are becoming a bit like a supervisor. When we ask for help, they do not only tell us how to do it, but say how we must think.

They spend more time with us in the innovative learning space. Here they have to sit down and ask themselves: “Why don't they understand this?” They use more time on each of us and I think they have started to see what people know. They are very good at remembering names and have started picking up on how people work and how to approach them.

# The teacher perspective

Access to the students' learning process.

Supervisor and discussion partner.

More effective to help a group instead of one student.

## TEAM-WORK

To change the practice is easier when you do it together.

Technical support that you can relay upon is crucial.