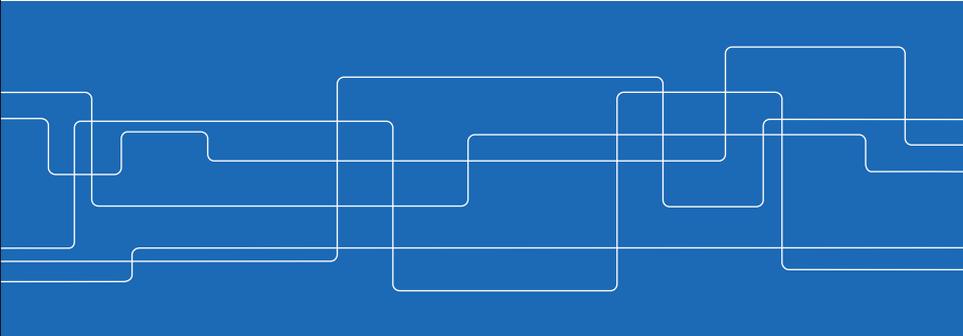


 Please note that some slides have been edited

 **Comparative judgement**

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 **My interest:**  
**Develop education where it matters the most-**  
**in the classroom.**



**Key words**  
*formative assessment, self-efficacy, assessment literacy, sTEem-education*

**On-going projects**

1. Embedding formative assessment in schools in Haninge
2. Comparative judgements and digital portfolios e.g. international collaborative study investigating teachers' assessment practices in USA, UK and Sweden w Purdue university
3. Programming with dyslectic students
4. Nordplus project *Beyond technology*- bring your own device, use (and not use) of mobile phones and iPads in instruction in Nordic countries Denmark, Finland and Sweden

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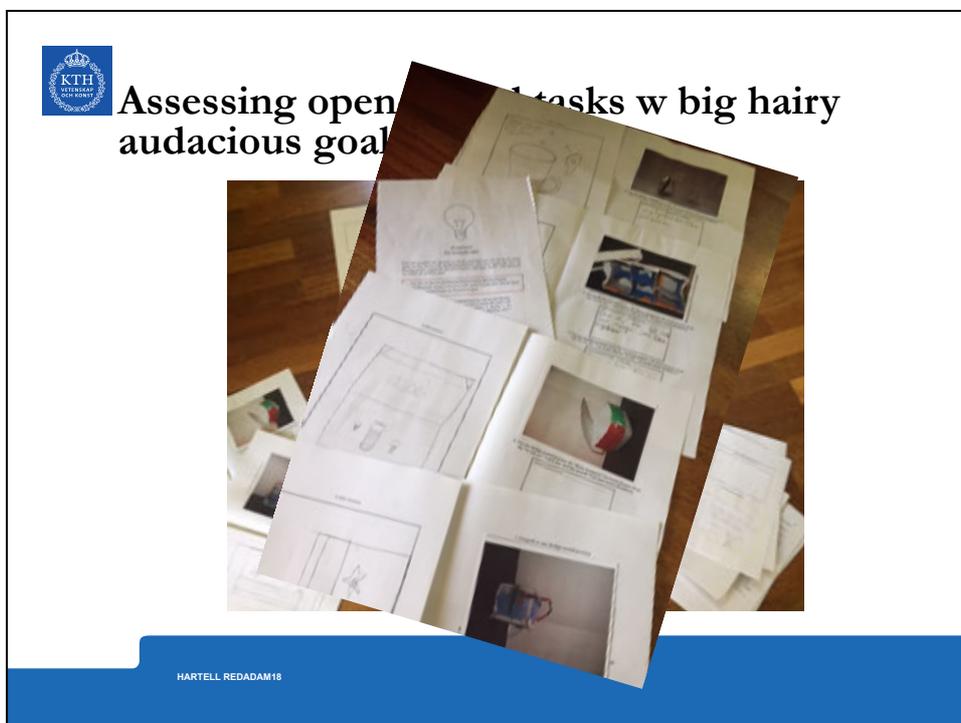


## Let's talk about the weather

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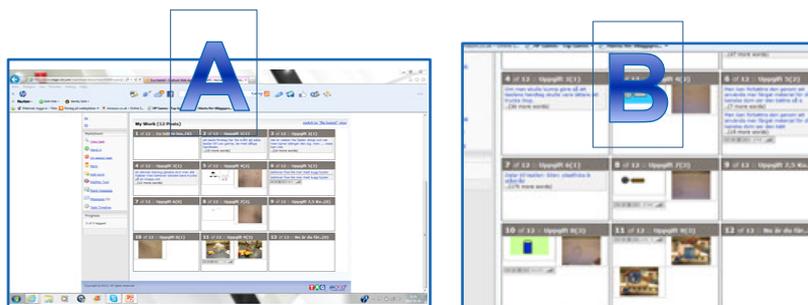


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## Comparative judgement



C.f. e.g. Pollitt (2012), Kimbell (2013), Bartholomew et al (2017), Canty et al (2017)

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## CJ



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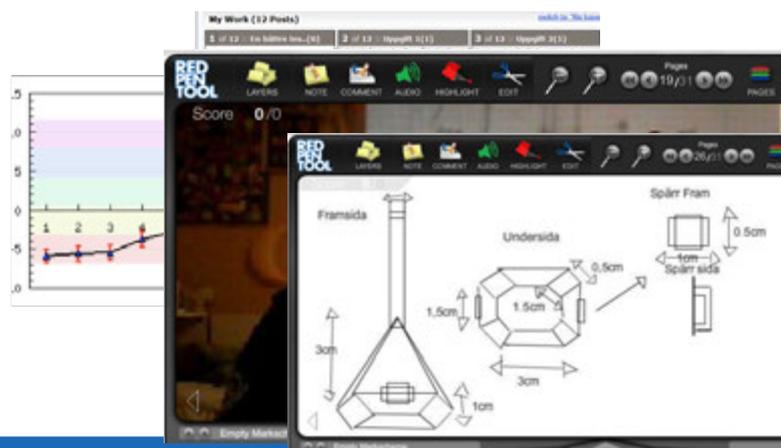
### Rank order? Not really What emerges is a collective professional consensus from the group of judges



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### Collective professional consensus from the group of judges (judges= teachers, students etc)



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# The power of the collective (93.2)



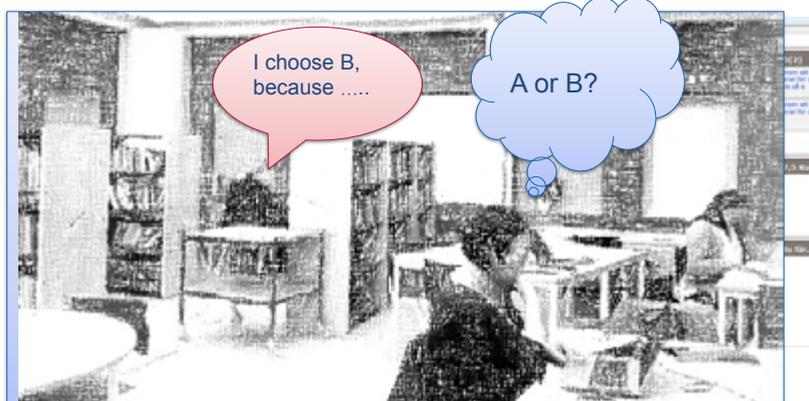
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So far so good	Case 1	Case 2	Case 3	Case 4 INTERNATION AL compare
Subject	Tech ed / design	Chemistry/ food nutrition	Tech ed / design ps	Tech/ Engineering ed
Topic/task	Tea dispenser	Food nutrition	Flobot's friend	Pill dispenser
Students	98	250	25	US
Age	13/14 + 15/16 y	10–12 years	11-year olds	13 year olds
Teachers	7	10	5	USA, UK, Sw
Intra rel				Portfolios

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## Lets find out more Unpacking teachers assessment practices



Hartell, E., & Skogh, I.B. (2015). Criteria for Success: A study of primary technology teachers' assessment of digital portfolios. *Australasian Journal of Technology Education*, 2(1). <http://doi.org/10.15663/ajte.v2i1.27>

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## What did the teachers think of ACJ

Fun! A bit insecure in the beginning, but I felt more confident after a short while.

It was amusing/fun and I learnt a lot. It is easier to assess this way. Compare two at a time.

I like the idea that we are more who co-assess

Interesting. Different.

Fun!! But tiny internet connection problems...

This was really interesting! Took a while to see and understand what I was supposed to look for. Purpose got more explicit on what qualities I were looking for.

### Nice to see other than my own students' work

"I found the assessment work through the portal gave me the strength to see students' work in a new way."

Fr Hartell & Skogh (2015) study

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## Many applications for CJ

1	21	21,elev140_	140	En
2	20	20,elev150_	150	En
3	19	19,elev279_	279	He
4	18	18,elev203_	203	Igi
5	17	17,elev258_	258	He
6	16	16,elev209_	209	Ky
7	15	15,elev192_	192	Igi
8	14	14,elev169_	169	En
9	13	13,elev156_	156	En
0	12	12,elev264_	264	He
1	11	11,elev160_	16	Ån
2	10	10,elev027_	27	Br
3	9	9,elev035_	35	Br
4	8	8,elev040_	40	Br
5	7	7,elev231_	231	Ky
6	6	6,elev029_	29	Br
7	5	5,elev141_	141	En
8	4	4,elev277_	277	He
9	3	3,elev137_	137	En
0	2	2,elev244_	244	Ky
1	1	1,elev149_	149	En

Eg

- Both summative and formative assessment purposes
- Track progress
- Peer assessment
- Teacher training!
- Connoisseurship
- Moderation (yourself / peer)
- Ranking schools

**Research method**

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## Comparative judgement

### Comparing teacher assessment practices of an engineering design challenge across countries



Eva Hartell<sup>1,2</sup>, Greg Strimel<sup>3</sup> and Scott Bartholomew<sup>3</sup>





<sup>1</sup>KTH Royal Institute of Technology, Stockholm, Sweden

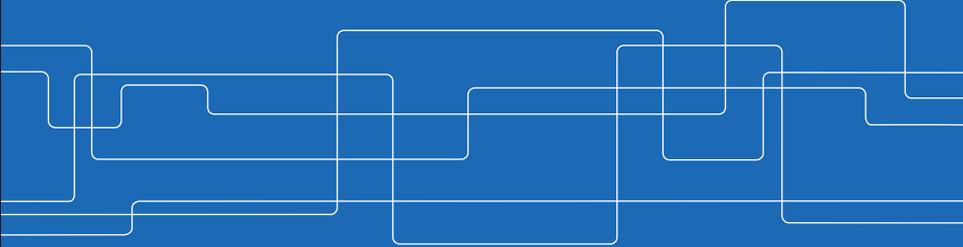
<sup>2</sup>Haninge municipality, Sweden

<sup>3</sup>Purdue University, USA

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# “Chaps”

**What it means in the U.S.:** Leather leggings worn by cowboys designed to protect the legs whilst horseback riding. **Same word and same meaning in Swedish**

**What it means in the U.K.:** Guys.

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## Design Differences



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## Technology / Engineering Education



*Manual Training*  
*Manual Arts*  
*Industrial Arts*  
*Technology Education*

*Sloyd (Slöjd)*  
*Science (natural/ social)*

*Teknik*

**Technology & Engineering Education**

**Teknik Technology**

**Design & Technology**

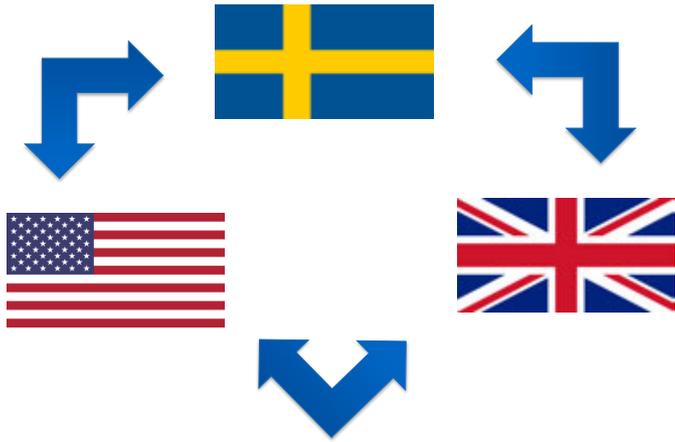
Different assessment practices!

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## Adaptive Comparative Judgment (ACJ): a tool for international collaborative studies

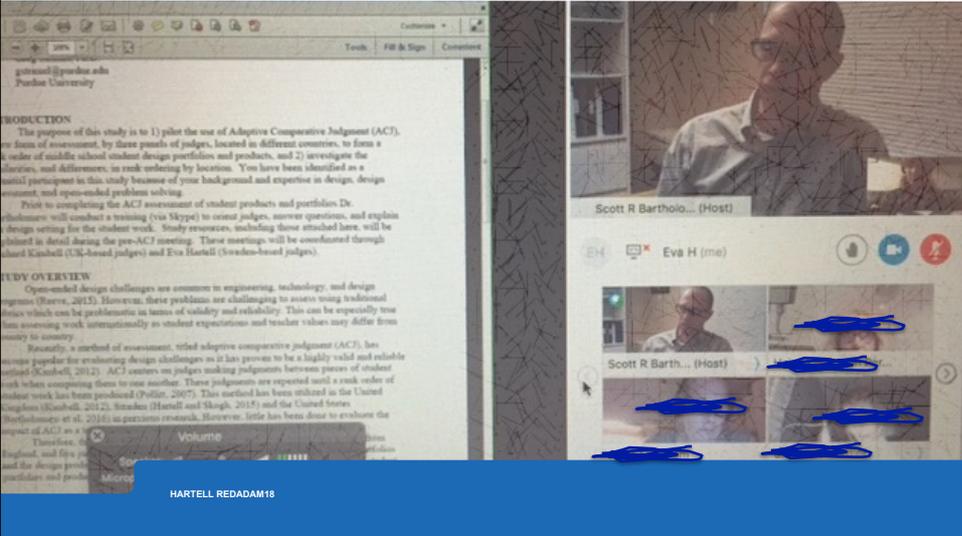
*Digging Deeper than Documents*



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## Training Session with Judges via Internet



**PRODUCTION**

The purpose of this study is to 1) pilot the use of Adaptive Comparative Judgment (ACJ), as a form of assessment, by three panels of judges, located in different countries, to form a rank order of middle school student design portfolios and products, and 2) investigate the similarities and differences in rank ordering by location. You have been identified as a national participant in this study because of your background and expertise in design, design assessment, and open-ended problem solving.

Prior to completing the ACJ assessment of student products and portfolios Dr. Bartholomew will conduct a training (via Skype) to orient judges, answer questions, and explain design setting for the student work. Study resources, including those attached here, will be explained in detail during the pre-ACJ meeting. These meetings will be coordinated through Edward Kishell (UN-based judge) and Eva Hartell (Sweden-based judge).

**STUDY OVERVIEW**

Open-ended design challenges are common in engineering, technology, and design programs (Reeve, 2015). However, these problems are challenging to assess using traditional devices which can be problematic in terms of validity and reliability. This can be especially true when assessing work internationally as student expectations and teacher values may differ from country to country.

Recently, a method of assessment, titled adaptive comparative judgment (ACJ), has become popular for evaluating design challenges as it has proven to be a highly valid and reliable method (Kardes, 2012). ACJ centers on judges making judgments between pieces of student work when comparing them to one another. These judgments are expected to form a rank order of student work that has been produced (Pulley, 2007). This method has been utilized in the United Kingdom (Kishell, 2012), Sweden (Hartell and Skogh, 2014) and the United States (Bartholomew et al., 2016) in previous research. However, little has been done to evaluate the impact of ACJ as a method of assessment in other countries.

Therefore, the purpose of this study is to investigate the impact of ACJ as a method of assessment on the design process and the design products.

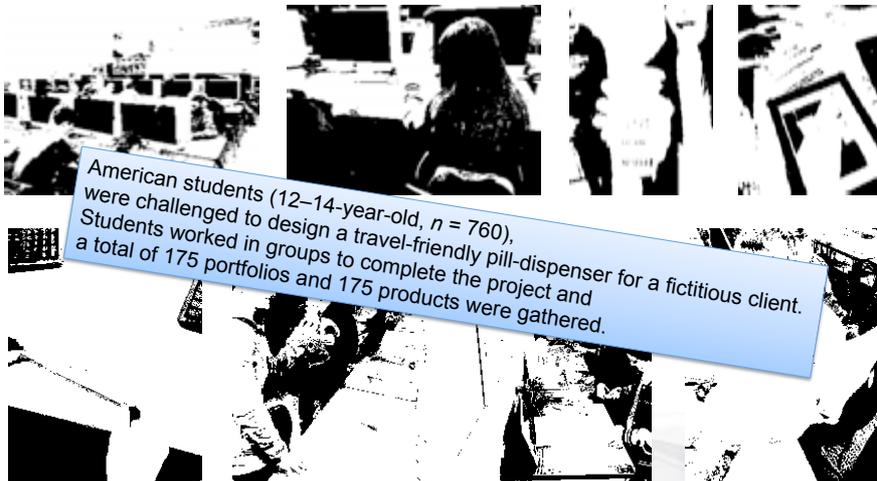
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## Context The Design Challenge

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# The Design Challenge



American students (12–14-year-old,  $n = 760$ ), were challenged to design a travel-friendly pill-dispenser for a fictitious client. Students worked in groups to complete the project and a total of 175 portfolios and 175 products were gathered.

Bartholomew, S. R. (2016). A Mixed-Method Study of Mobile Devices and Student Self-Directed Learning and Achievement During a Middle School STEM Activity (Doctoral dissertation, Utah State University).



# Product & Process were assessed though ACJ in three countries



## Results - Products

Rank	United States of America .959	United Kingdom .967	Sweden .973
<b>1</b>	<b>Group 200<sub>e</sub></b>	Group 37	<b>Group 192<sub>f</sub></b>
<b>2</b>	Group 100	Group 35	<b>Group 18<sub>i</sub></b>
<b>3</b>	Group 12	Group 115	Group 76
<b>4</b>	<b>Group 192<sub>f</sub></b>	<b>Group 105<sub>g</sub></b>	<b>Group 200<sub>e</sub></b>
<b>5</b>	Group 147	<b>Group 122<sub>h</sub></b>	Group 130
<b>6</b>	<b>Group 105<sub>g</sub></b>	Group 108	Group 68
<b>7</b>	Group 61	Group 154	<b>Group 122<sub>h</sub></b>
<b>8</b>	Group 2	<b>Group 18<sub>i</sub></b>	Group 190
<b>9</b>	Group 72	<b>Group 200<sub>e</sub></b>	Group 112
<b>10</b>	Group 5	Group 187	Group 9

# Group 122

## Top Product

### #5 – UK; #7 – Sweden

## Top Portfolio

### #1 – US; #7 – UK

<p>How did you like the children that did not bring in any ideas. How to you like to make a list. How to be able to list the group members who the jobs had to be done. How to make a small enough to fit into a poster.</p>	<p>Interested other people in our group wanted. Fourth, they had to be able to list the group members who the jobs had to be done. How to make a small enough to fit into a poster.</p>	<p>plastic cup covered with something covered with another layer. How to make a small enough to fit into a poster.</p>	<p>plastic cup covered with something covered with another layer. How to make a small enough to fit into a poster.</p>
<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>
<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>
<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>	<p>How to make a small enough to fit into a poster.</p>

## Unpacking- Similarities & Differences -

(Product Comments)



### Results

ACJ is

- a useful tool to unpack teachers' assessment practices
- useful for international comparisons

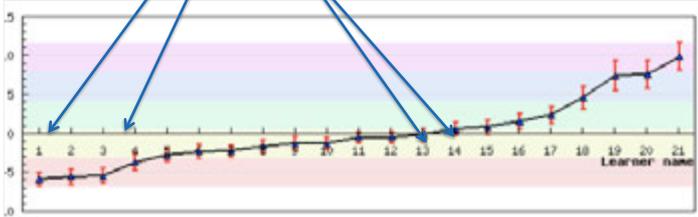
There seems to be different values btw these three countries.

Task design

Bartholomew, Hartell & Strimel (2017)  
Hartell, Strimel & Bartholomew (2017)  
Bartholomew, Yoshikawa, Hartell & Strimel (2018)

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 **Check consistency?**



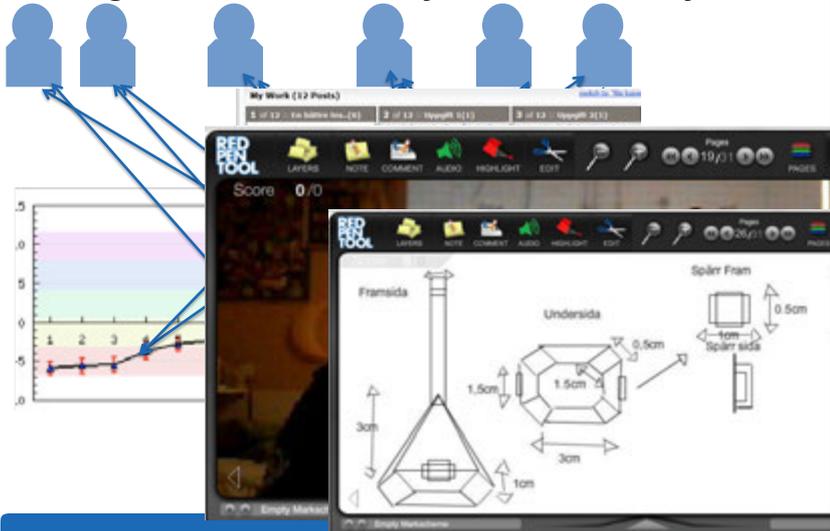
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 **Connoisseur of wine sTEM**



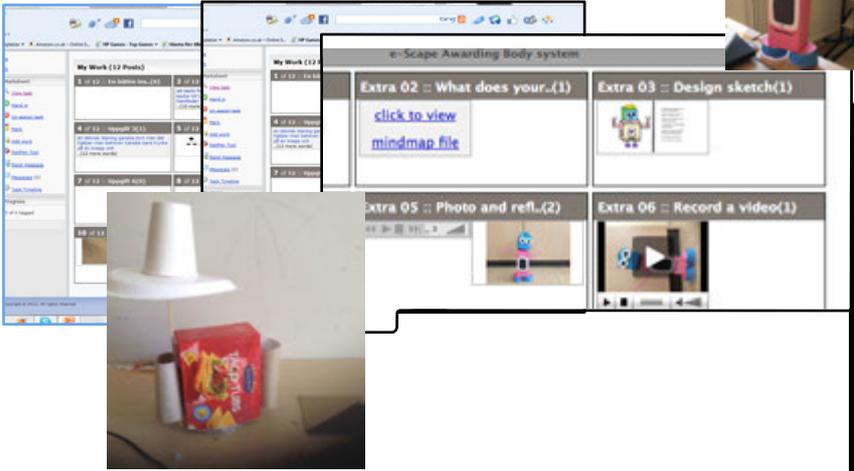
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 **Future research: Criteria for success? Feedback?  
Building assessment literacy and self-efficacy?**



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 **Exemplars**



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## Let learners work with other learners' work

Teachers, student teachers,  
and students!!



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## Providing affordance for teachers' assessment practices w e-portfolios & comparative judgement

- Data is collected during “ordinary” lesson activities
- Students collect evidence of learning (validity & teachers work load)
- Decision driven data collection instead of data driven decision making
- Reliable results
- Judge consistency
- Inviting other professionals to your classroom and you get to visit theirs “without too much trouble” (cloud-based)
- *The power of the collective & profession*



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### ASSIDERE NECESSE EST

Necessities and complexities regarding teachers' assessment practices

To be continued..

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Welcome to rEDHan  
March 10, 2018



HARTELL REDADAM18



**Thanks for listening!**  
**Good luck and please keep in touch**

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Haninge  
kommun



**PURDUE**  
POLYTECHNIC

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