



# Proseminar SS11

## ***“Different collaborative tasks - Different displays”***

The choice of display environment

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1. Overview of display types
2. Advantage and disadvantage of each display
3. Which display for which task?
4. Summary

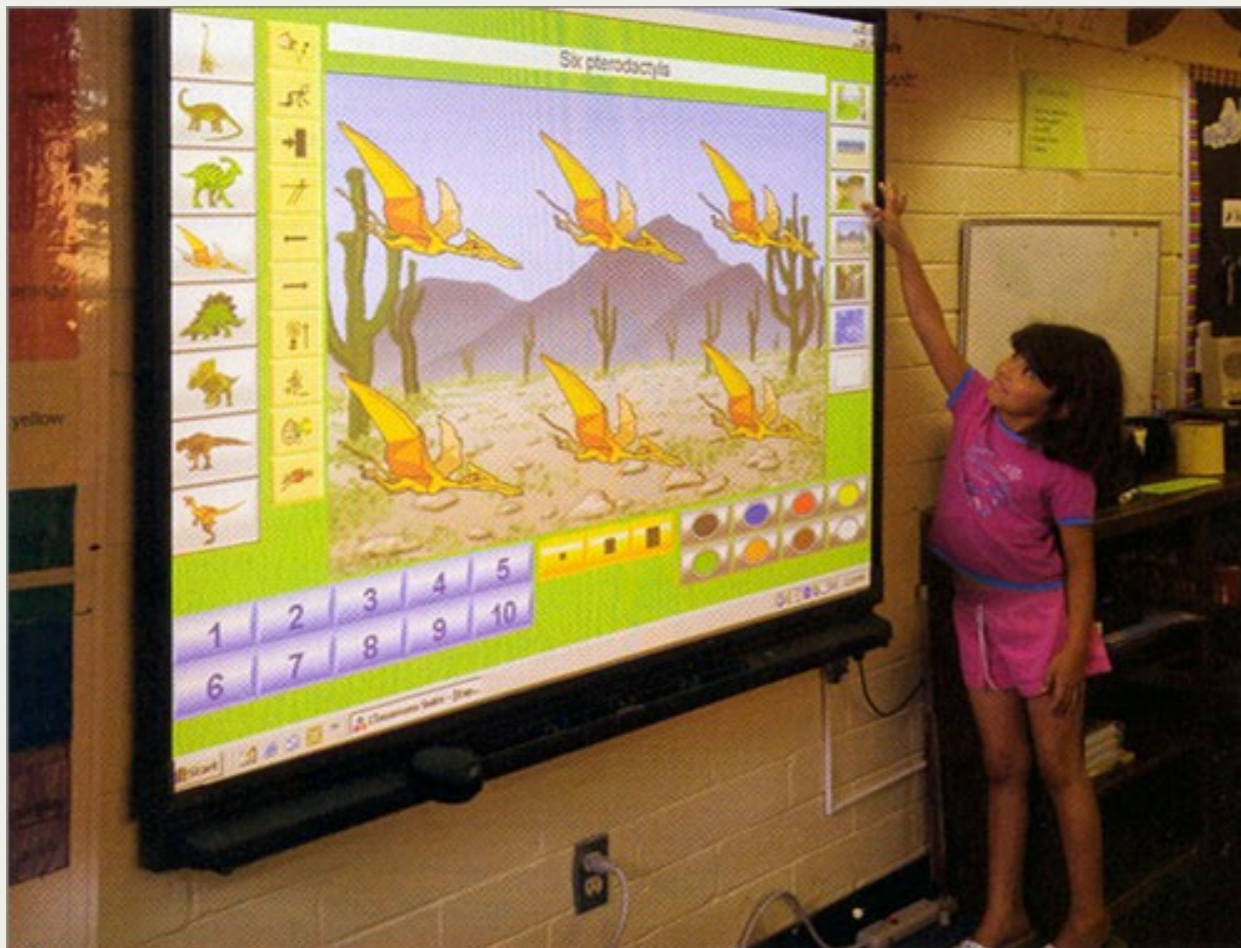


# 1. Display overview



# Tabletop

Source: <http://hci.ucsd.edu/>



## Interactive whiteboard

Source: <http://www.spectronicsinoz.com/images/product/intelli/ics-inwhiteboard.jpg>



## Desktop monitors

Source: <http://stats.wustl.edu/>



## Mobile devices

Source: <http://www.imex.ie>



## Multi display environment

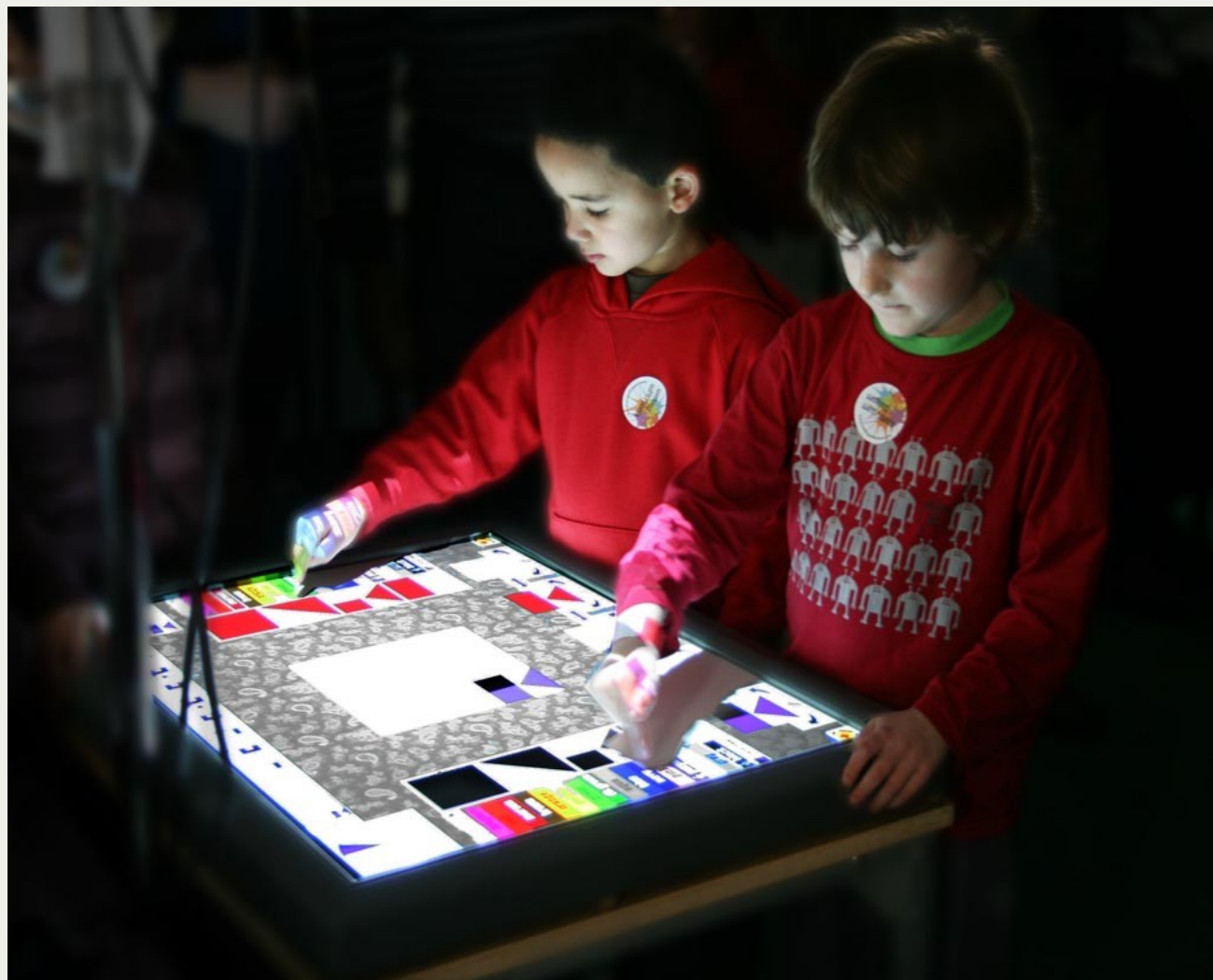
Source: [http://4.bp.blogspot.com/\\_D8P4hByt4sc/TDqoIF4r-EI/AAAAAAAAASU/GSeWfzNWpul/s1600/IMG\\_0512.JPG](http://4.bp.blogspot.com/_D8P4hByt4sc/TDqoIF4r-EI/AAAAAAAAASU/GSeWfzNWpul/s1600/IMG_0512.JPG)





## 2. Advantage and disadvantage of each display

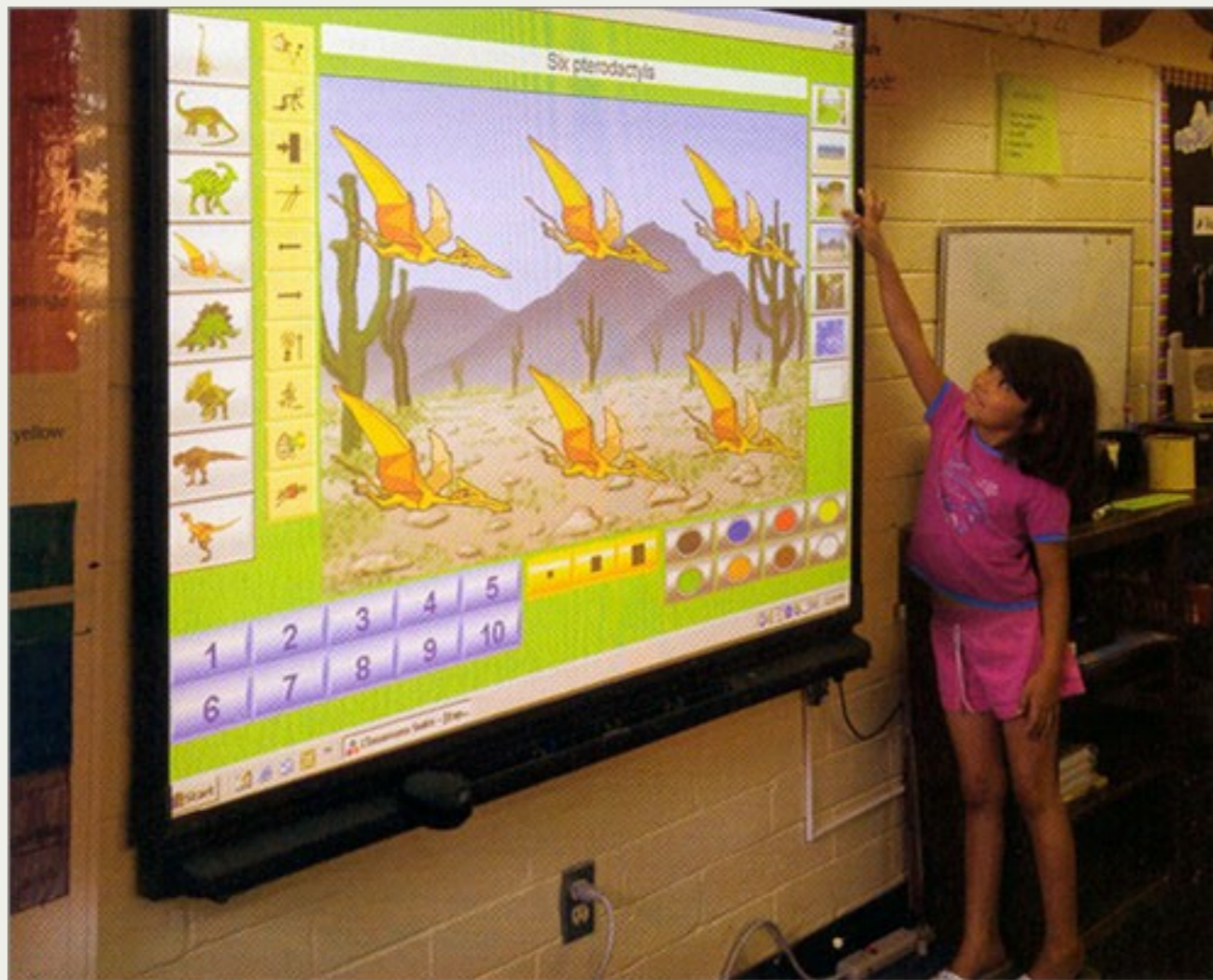
# Tabletop



- + flexible user arrangement
- + known from table
- + on-task communication
  
- risk of interfering each other

Source: <http://edutech.uni-saarland.de/uploads/DigiTile-InAction.jpg>

# Interactive whiteboard



- + same perspective
- + focused → time-efficient
- + maintain awareness of activities
  
- viewer in front
- not enough place for „real“ collaboration
- reaching problems possible

Source: <http://www.spectronicsinoz.com/images/product/intelli/ics-inwhiteboard.jpg>

# Desktop computer



- + on-task communication essential
- one-user, one-display paradigm
- older students feel socially uncomfortable

Source:

[http://1.bp.blogspot.com/\\_k5GGAegVuso/TLXB80RUFVI/AAAAAAAAEEQ/6KdxBY5GWg/s1600/collaborative.bmp](http://1.bp.blogspot.com/_k5GGAegVuso/TLXB80RUFVI/AAAAAAAAEEQ/6KdxBY5GWg/s1600/collaborative.bmp)

# Mobile devices



- + control from anywhere
- + individual devices / workspace

Source: <http://www.einstruction.eu>

# Multi display environments



- + combine advantages
- + individual workspace

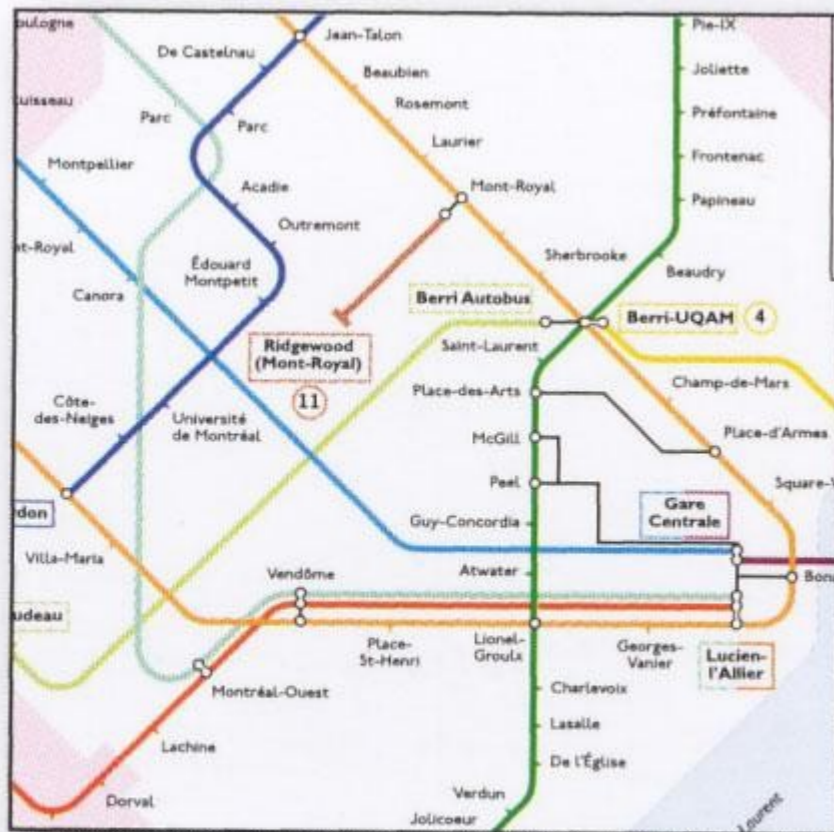
- distraction possible

Source: [http://4.bp.blogspot.com/\\_D8P4hByt4sc/TDqoIF4r-EI/AAAAAAAAASU/GSeWfzNWpul/s1600/IMG\\_0512.jpg](http://4.bp.blogspot.com/_D8P4hByt4sc/TDqoIF4r-EI/AAAAAAAAASU/GSeWfzNWpul/s1600/IMG_0512.jpg)



# 3. Which display for which task?

# Exploratory Study (Kori Inkpen et al., 2005)



Montreal

- 48 participants
- four display factors:
  - ◆ angle
  - ◆ user arrangement
  - ◆ display size
  - ◆ number of displays

Source: <http://www.mapstop.co.uk/>

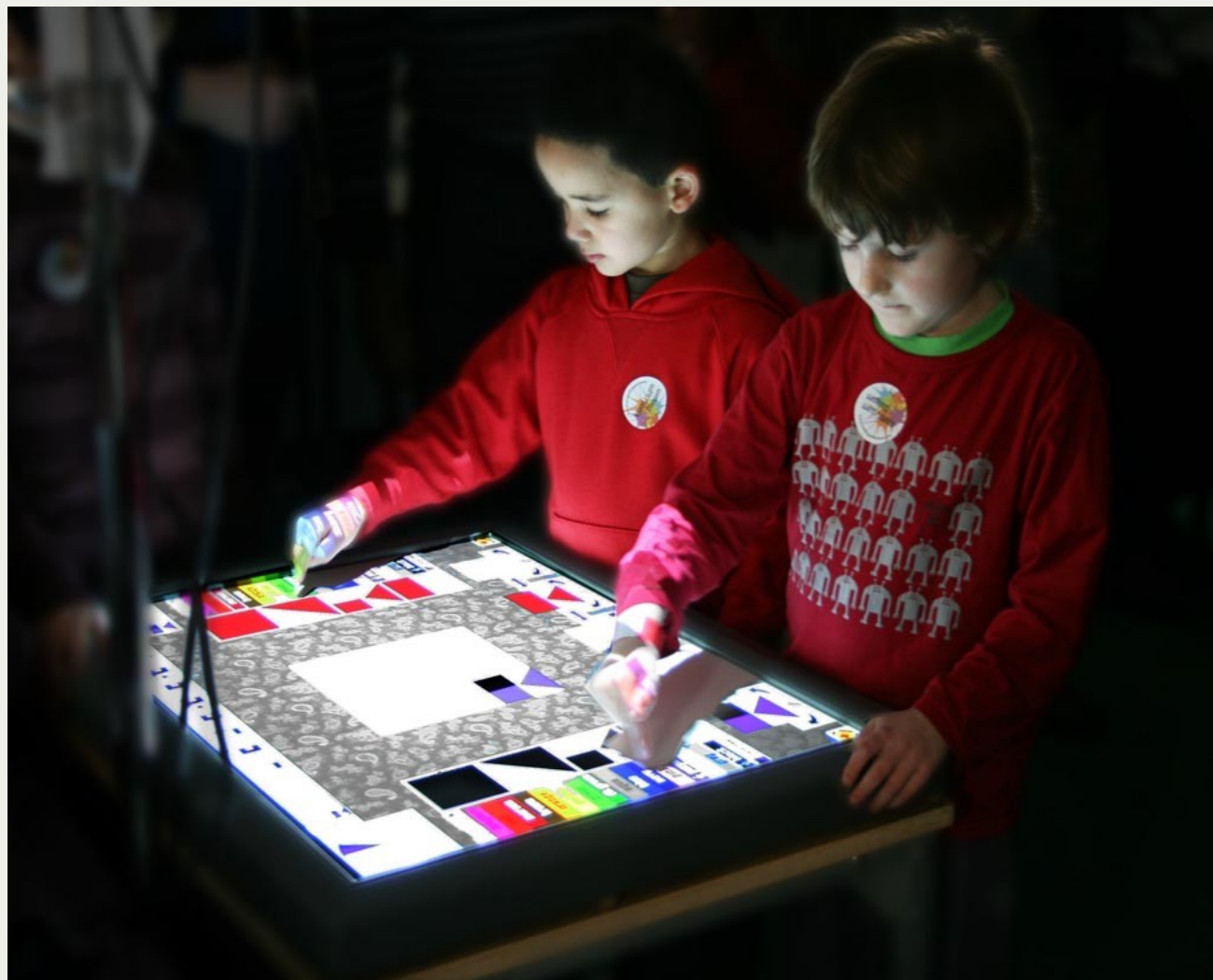




	ANGLE		ARRANGEMENT			SIZE		NUMBER	
	Horizontal	Vertical	Side-by-Side	Right-Angle	Face-to-Face	Large	Small	One Display	Two Displays
<b>Pointing gestures</b>	115 (36)	70 (51)	101 (16)	107 (39)	87 (36)	132 (74)	75 (32)	126 (58)	101 (29)
<b>Writing</b>	33 (11)	30 (17)	34 (19)	26 (16)	32 (17)	30 (19)	20 (13)	28 (8)	28 (14)
<b>Partner gaze</b>	22 (13)	19 (15)	9 (8)	24 (14)	15 (17)	18 (13)	8 (7)	25 (16)	22 (17)
<b>On-task communication</b>	94 (32)	61 (21)	62 (37)	84 (20)	75 (25)	94 (49)	61 (32)	97 (32)	66 (32)
<b>Preparatory communication &amp; clarification</b>	17 (7)	10 (4)	15 (4)	15 (11)	14 (11)	21 (8)	26 (17)	19 (13)	20 (13)
<b>Ratio of physical activity between partners</b>	.46 (.12)	.49 (.15)	.38 (.25)	.33 (.23)	.63 (.23)	.65 (.26)	.46 (.24)	.39 (.18)	.76 (.23)

Source: Kori Inkpen et al. (2005), Exploring Display Factors that Influence Co-Located Collaboration: Angle, Size, Number, and User Arrangement

# Tabletop



- two or more people gather around tabletop
- on-task communication to solve task

## Task:

Solve exercise together

Application (for example):

**DigiTile**

Source: <http://edutech.uni-saarland.de/uploads/DigiTile-InAction.jpg>

# Interactive whiteboard



- everybody sees everything of the data

Task (for example):  
Collaborate creating

Source: <http://www.eecs.berkeley.edu/>

# Desktop computer



- most uncomfortable way of CSCL

Task:  
Getting children introduced to  
CSCL

Source:

[http://1.bp.blogspot.com/\\_k5GGAegVuso/TLXB80RUFVI/AAAAAAAAEEQ/6KdxBY5GWg/s1600/collaborative.bmp](http://1.bp.blogspot.com/_k5GGAegVuso/TLXB80RUFVI/AAAAAAAAEEQ/6KdxBY5GWg/s1600/collaborative.bmp)

# Mobile devices



- bring separate data together (whiteboard)

Task:  
include students in lesson design

Application (for example):  
**KidStory, ImageMap**



Sources: [http://www.innovations-report.de/bilder\\_neu/3760\\_kid\\_pad.jpg](http://www.innovations-report.de/bilder_neu/3760_kid_pad.jpg),  
<http://hcil.cs.umd.edu/> (right)

# Multi display environments

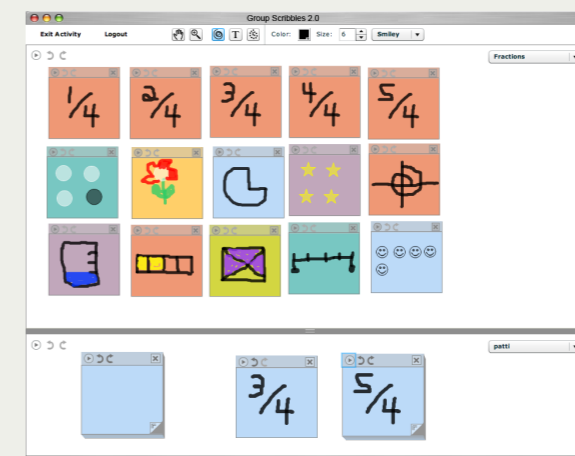


- individual workspace + public board

## Task:

like mobile devices, but more possibilities

Application (for example):  
**GroupScribbles**



Sources: <http://4.bp.blogspot.com/> <http://groupscribbles.sri.com/> (right)



# 4. Summary



- two or more users → shared display
- displays are flexible → can't be allocated to certain tasks
- all types together → use collaborative learning to full capacity





# Thanks for your attention !