

# ICT in Teaching & Learning: Don'ts & Do's from Research

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research  **ED**  
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# Your attention please....



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# 1. Kids/people can multitask



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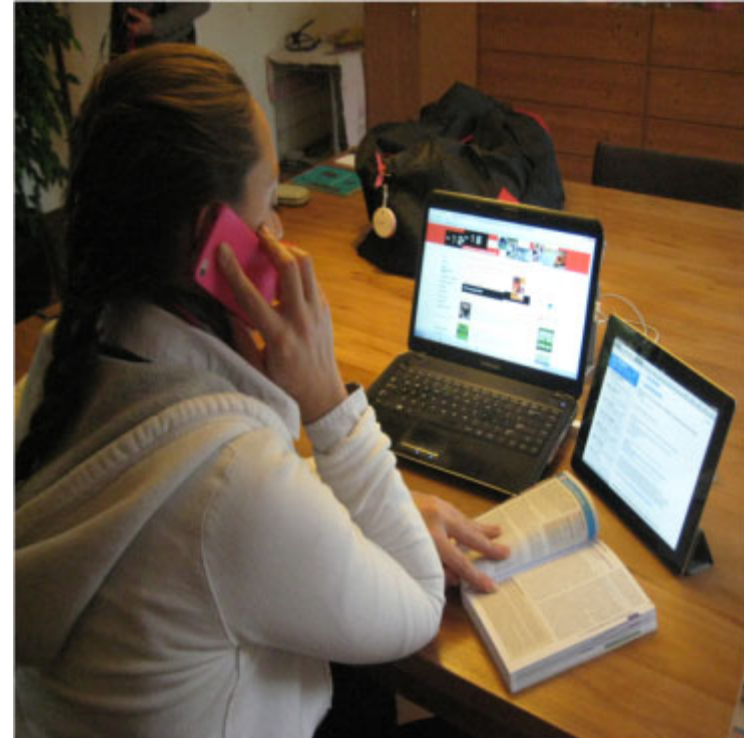


## The multitasker

- Can carry out 2 or more info processing activities at the same time
- No loss of speed
- No loss of accuracy
- Origin: Computer with multiple CPU's

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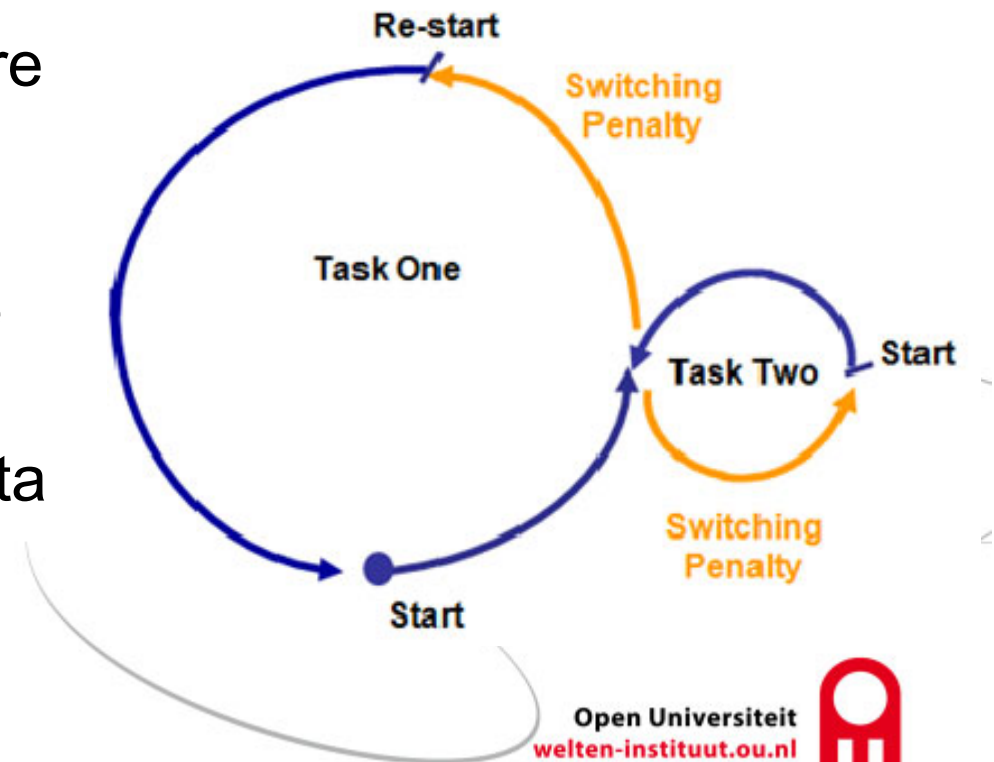


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## The task switcher

- Switches between 2 or more info processing activities
- Continual restarting of a process at a different place (reinstatement searches)
- Switches between schemata
- Slower / Mistakes



## ...and the consequences?

- Longer study time to mastery

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## ...and the consequences?

- Longer study time to mastery
- Lower grades





## ...and the consequences?

- Longer study time to mastery
- Lower grades
- Miss important things



## ...and the consequences?

- Longer study time to mastery
- Lower grades
- Miss important things
- Loss of concentration (longer term)



## ...and the consequences?

- Longer study time to mastery
- Lower grades
- Miss important things
- Loss of concentration (longer term)
- **Classic addiction phenomena**



## Don't...

- allow switching
- encourage switching

## Do...

- encourage mono-tasking
- have kids themselves experience the difference

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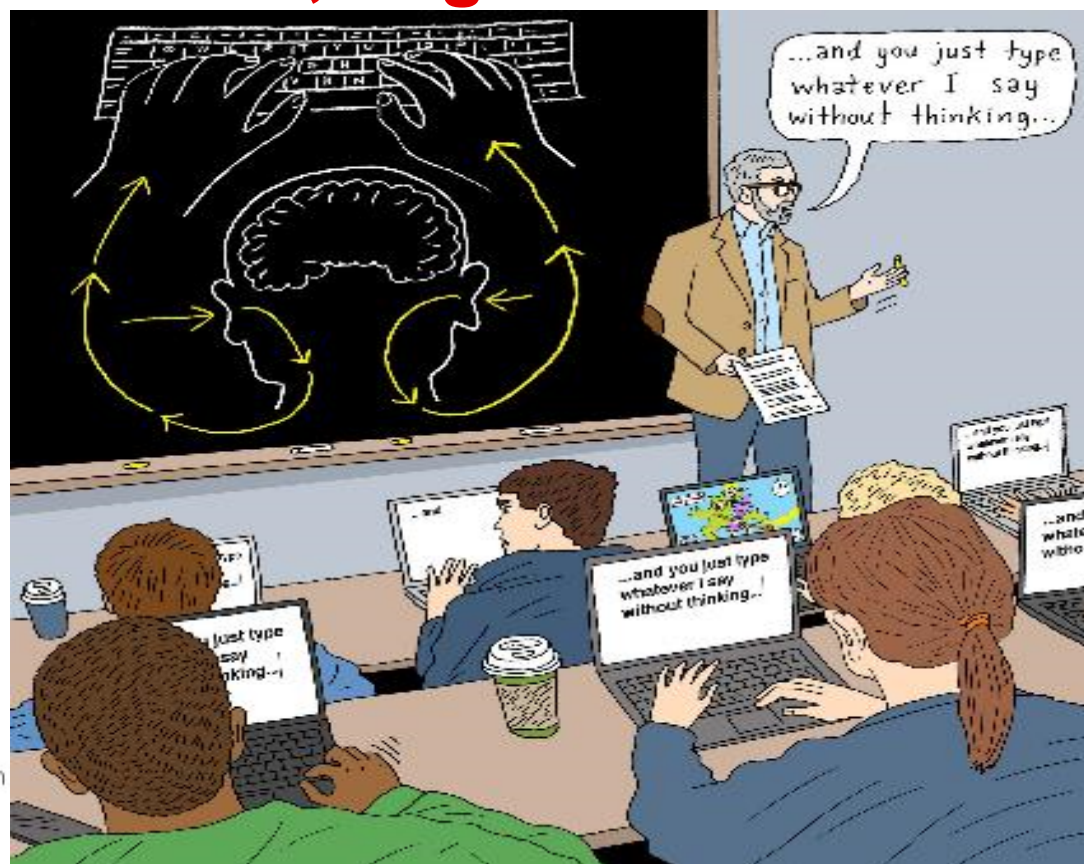
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<https://onderzoekonderwijs.net/2015/06/08/typen-of-schrijven/>

## 2. Notes: Ears in, fingers out



## Learning

- Better results directly after the lesson
- Better results a week later after reviewing notes

## Why?

- Processing during note taking (choose main points, paraphrase, summarise)
- Second time processing, plus deeper processing of one's own notes

## Don't...

- allow note taking on a laptop or other device

## Do...

- teach kids to take notes
- teach kids to summarise
- teach kids to outline
- teach kids to study

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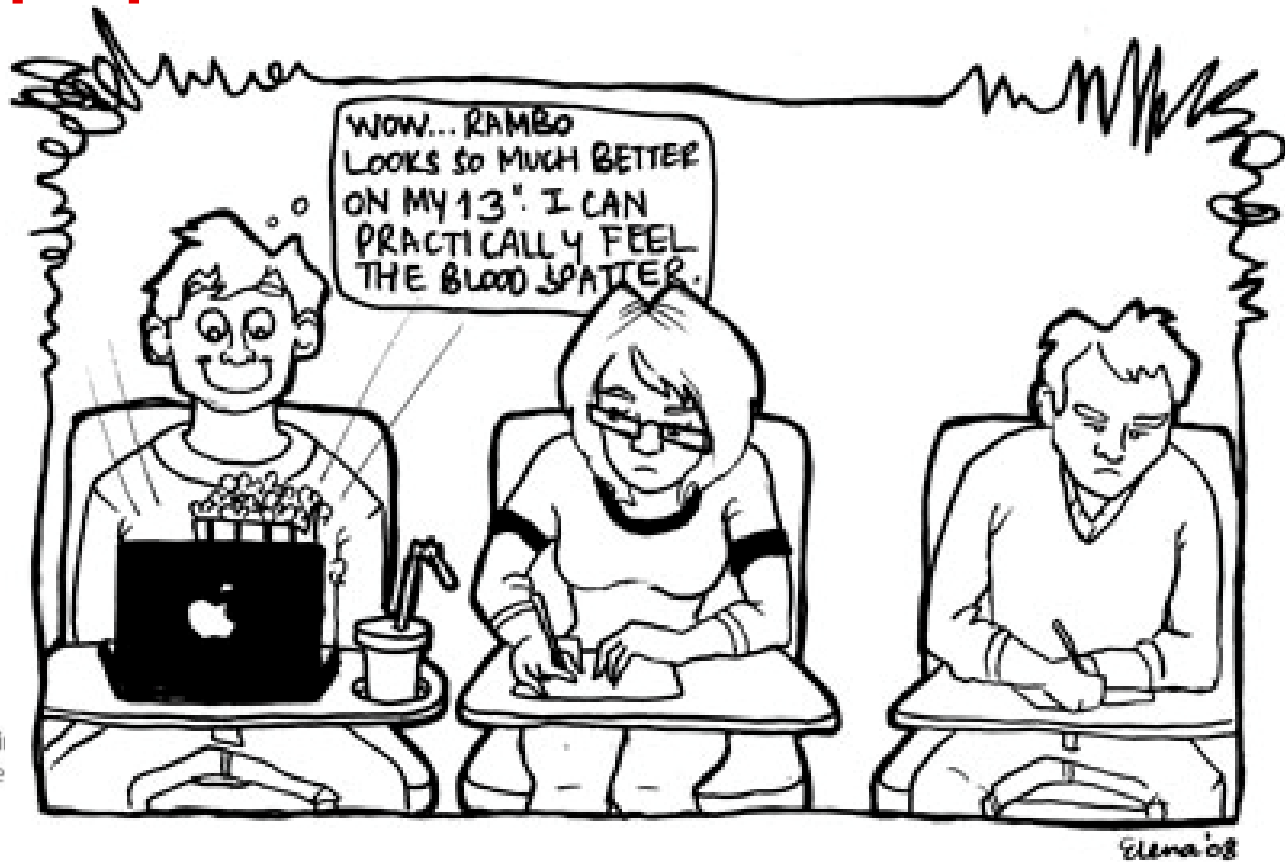
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### 3. Laptops: The new 2<sup>nd</sup>-hand smoke

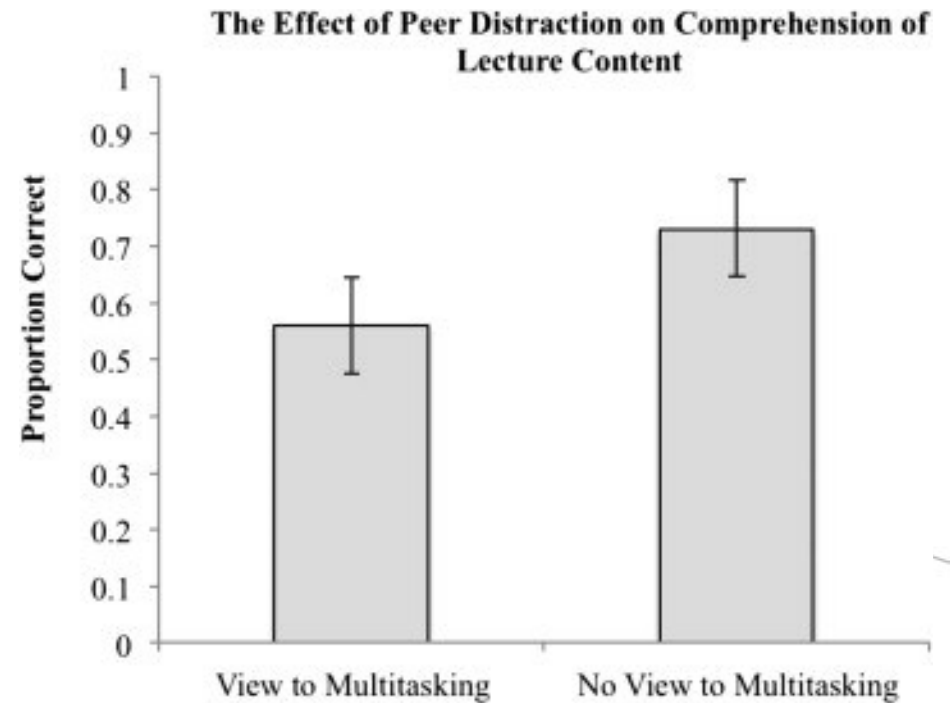
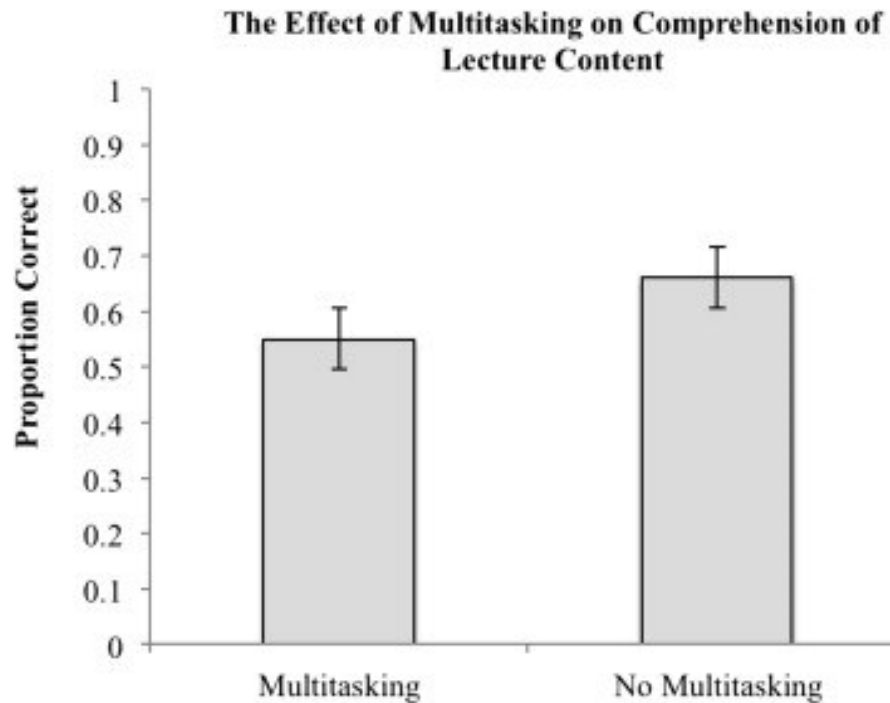


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75% besteedden veel tijd aan activiteiten die niets met leren te maken hadden;  
 >40% waren gedeeltelijk of helemaal afgeleid door online gedrag van anderen

## Don't...

- allow mobile devices to be used unless necessary for the lesson
- cave in to kids or parents

## Do...

- create online moments in the lessons

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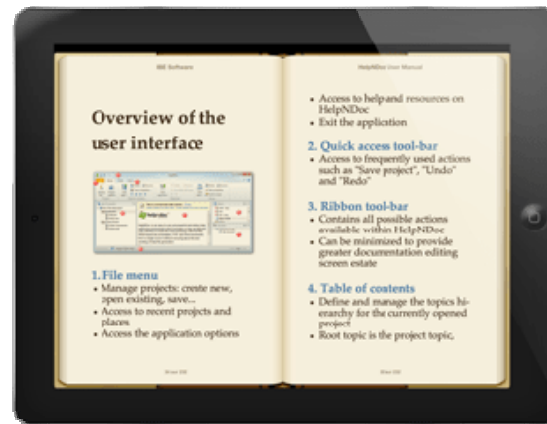
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## 4. Reading is reading, isn't it?



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- Reading from the screen is faster than from paper.
- Students thought that they understood the content better from the screen.
- Understanding of the content was better from paper.
- The carrier (printed or screen) makes no difference for general questions (e.g., What was the text about?).
- For more specific questions, printed was significantly better.
- No difference e-reader, tablet, or computer screen.



## Don't...

- assign reading online
- use online textbooks

## Do...

- print materials and hand them out
- encourage low-cost open educational resources (OER)

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<https://onderzoekonderwijs.net/2015/06/08/typen-of-schrijven/>

## 5. Pupils are media savvy digital natives



## Homo zappiëns / Digital native

Generation of learners that independently, playfully, and without instruction have developed metacognitive skills for:

- discovery learning
- inquiry learning
- learning in networks
- experimenting
- collaborative learning
- active learning
- self directed learning
- problem-based learning



**Homo zappiëns?**

...or Attention Deficit Hyperlink Disorder





## Don't...

- be fooled
- believe eduquacks and new-age prophets

## Do...

- assess what kids can do before beginning to use a technique
- let kids acquire skills before requiring them
- use good direct / explicit instruction

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## 6. Knowledge is perishable / It's all on the web



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## Is knowledge perishable?...No

- Enormous increase in available information
- Enormous increase in available sources
- But the old isn't all of a sudden wrong
- The old is necessary to understand and judge new info



## It's all on the web

- How do you choose?
- Many – unreliable - sources
- It's not about searching; it's about finding, evaluation, and properly using!



# Sir Francis Bacon



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Natuurfilosoof: 1561-1626



Kunstenaar: 1909-1992

## Don't...

- assume that kids can use the web effectively or efficiently
- give assignments without proper instruction

## Do...

- teach kids how to search properly
- teach kids how to evaluate sources
- give feedback on the process and product



## Clark (media)

*'[...] media are mere vehicles that deliver instruction but do not influence student achievement any more than the truck that delivers our groceries causes changes in our nutrition. Basically, the choice of vehicle might influence the cost or extent of distributing instruction, but only the content of the vehicle can influence achievement'*



## Dubious reasons to use multimedia learning

1. Leads to more learning
2. Is more motivating
3. Uses pedagogical agents that support learning
4. Adapts to various learning styles and thus optimises learning for more learners
5. Facilitates learner-directed, constructivist, and discovery learning approaches

(Clark & Feldon, 2006)



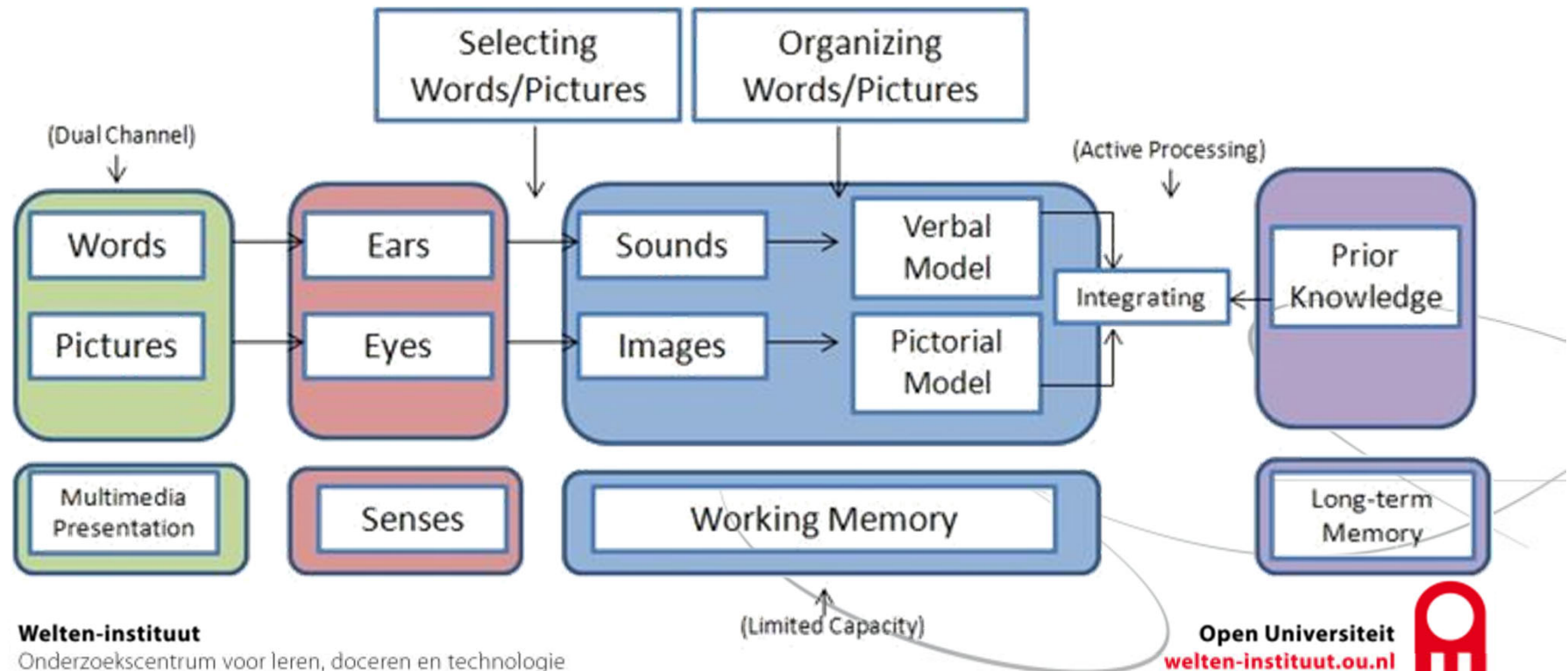


## Dubious reasons to use multimedia learning

6. Autonomy and control over the sequence of instruction
7. Higher order thinking skills
8. Incidental learning of enriching information
9. Interactivity
10. Authentic learning environments and activities



# Cognitive Theory of Multimedia Learning (Mayer)





<https://3starlearningexperiences.wordpress.com/>

Ingredients | Tools | Techniques

## 3-STAR LEARNING EXPERIENCES

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SEARCH RESULTS FOR: SMOKE

smoke

### LAPTOPS IN CLASS ARE THE NEW SECOND-HAND SMOKE

January 9, 2018

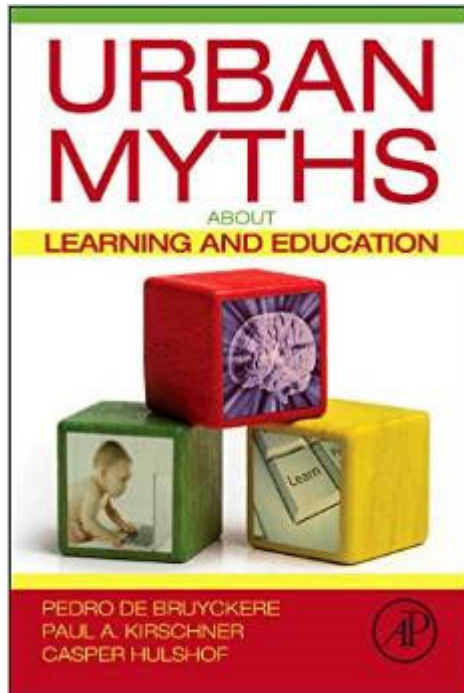
4 Comments

[Edit](#)

Paul A. Kirschner OK; I've covered taking notes with or without laptops and whether people learn better if they read from paper or screen. This is the third blog in an apparent, unplanned, trilogy. Disclaimer: Let's sketch/frame the situation so there are no misunderstandings. Yes, I know that

- EXPLORE OUR MOST RECENT BLOGS -

[Shut Off Those Laptops When You Don't Need Them!](#)



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