



Maastricht University

*Leading
in Learning!*

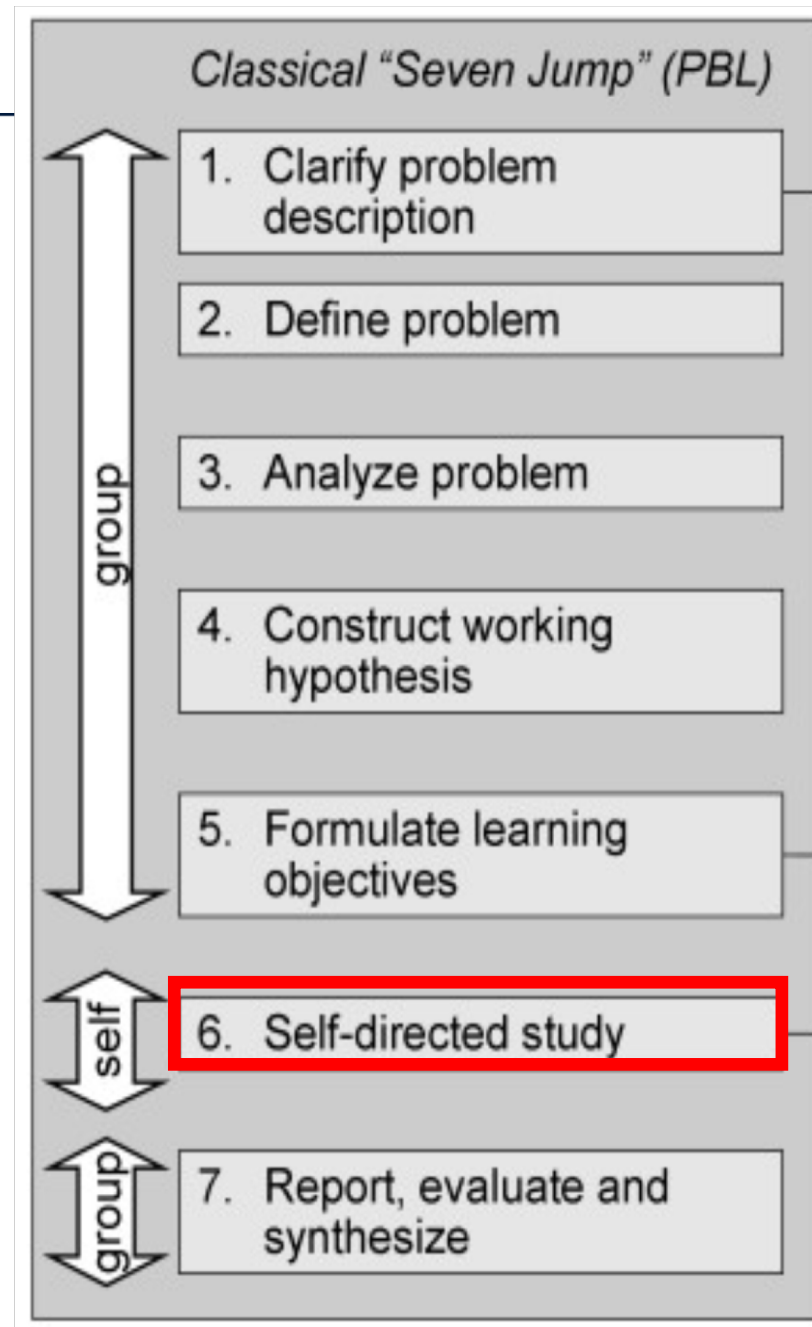
HOW DO WE LEARN?

Insights from cognitive psychology

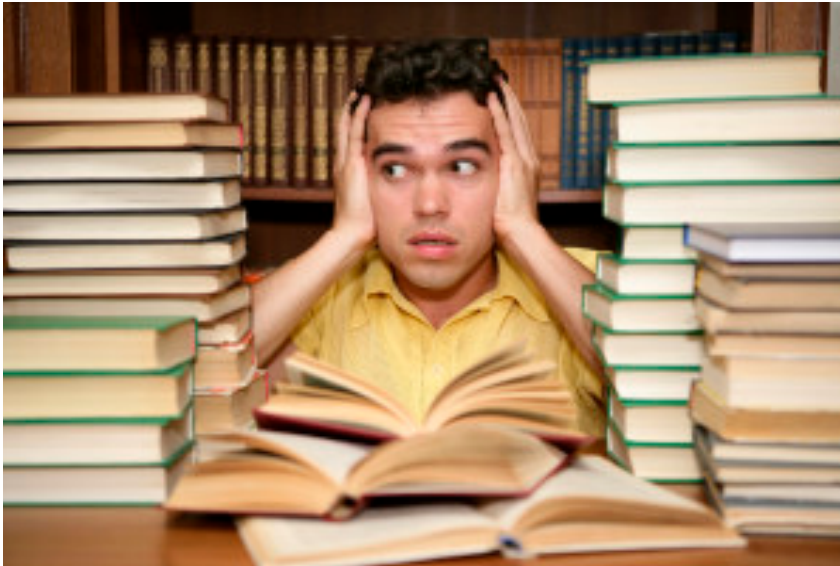
NRO

NATIONAAL REGIEORGAAN
ONDERWIJSONDERZOEK

Anique de Bruin
School of Health Professions Education
Maastricht University - The Netherlands



60-90% low effective strategies



What are effective learning strategies?

(those that promote long-term retention
& comprehension)



Improving Students' Learning With Effective Learning Techniques: Promising Directions From Cognitive and Educational Psychology

Psychological Science in the
Public Interest

14(1) 4–58

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DOI: 10.1177/1529100612453266

<http://pspi.sagepub.com>



**John Dunlosky¹, Katherine A. Rawson¹, Elizabeth J. Marsh²,
Mitchell J. Nathan³, and Daniel T. Willingham⁴**

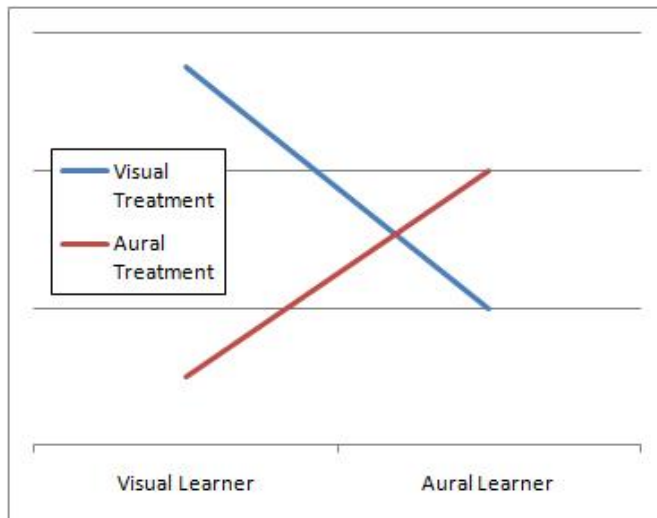
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³Department of Educational Psychology, Department of Curriculum & Instruction, and Department of Psychology,

University of Wisconsin–Madison; and ⁴Department of Psychology, University of Virginia

Idiosyncratic ideas & resistance to change

- 'My strategies are effective'
- 'These strategies don't work in my case'
- Learning styles (visual vs auditive, thinker vs doer, etc.) → no evidence!



EDUCATIONAL PSYCHOLOGIST, 48(3), 169-183, 2013
Copyright © Division 15, American Psychological Association
ISSN: 0046-1520 print / 1532-6985 online
DOI: 10.1080/00461520.2013.804395

 Routledge
Taylor & Francis Group

Do Learners Really Know Best? Urban Legends in Education

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Summarizing:

Write down main points

Self-explanation:

during reading; how does it relate to what I know?

Highlighting/underlining

Distributing study/practice

repeat over study sessions

Imagery:

create a mental image

Interleaved practice:

Mix learning of related topics

Elaborative interrogation:

Ask yourself 'why' questions about facts

Rereading

Self-testing:

Take a practice test

Keyword mnemonic:

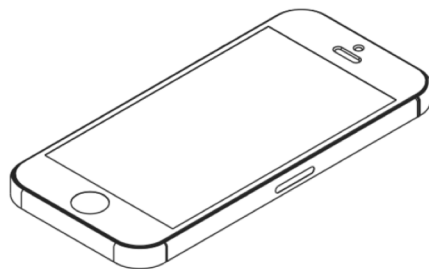
Generate image of (foreign) words/terms

Time for action



Highly effective	Moderately effective	Not effective

Go to www.menti.com and use the code 70 30 63



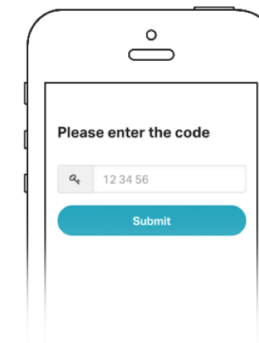
1

Grab your phone

www.menti.com

2

Go to www.menti.com



3

Enter the code 70 30 63 and vote!

Self-explanation

Highlighting/underlining

Summarizing

Effective learning strategies

Distributed

- **Cognitive effect:** Active retrieval of knowledge
- **Metacognitive effect:** Provide direct & undeniable feedback to students

Interleaved

Keyword mnemonic

Rereading

Self-testing

- Rehearse learning of information
- (instead of cramming before test)

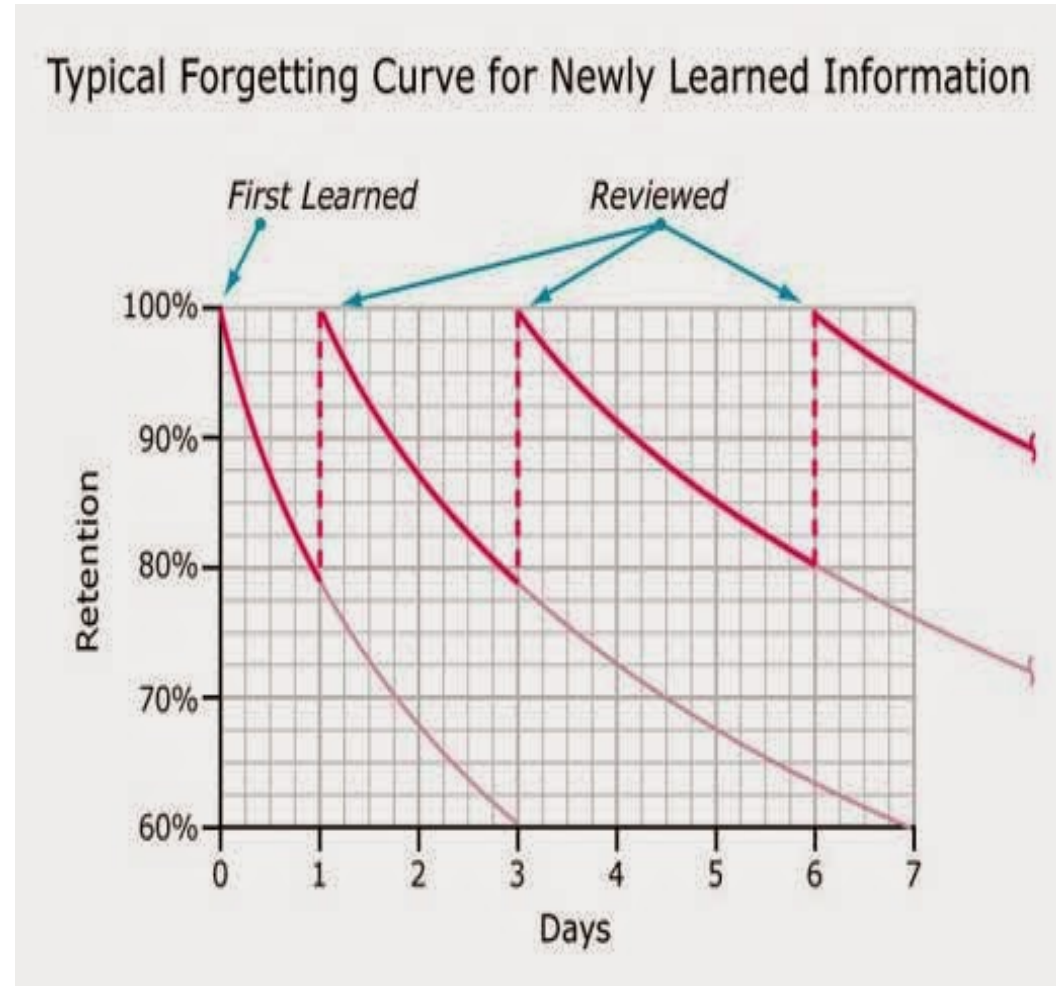


TABLE 2

Mean percentage of correct recall of massed and spaced words (with *SD* in parentheses)

<i>Learning condition</i>	<i>Final test</i>	
	<i>After 1 week</i>	<i>After 5 weeks</i>
Massed	46.46% (25.85)	42.22% (23.07)
Spaced	55.96% (26.24)	49.49% (27.13)

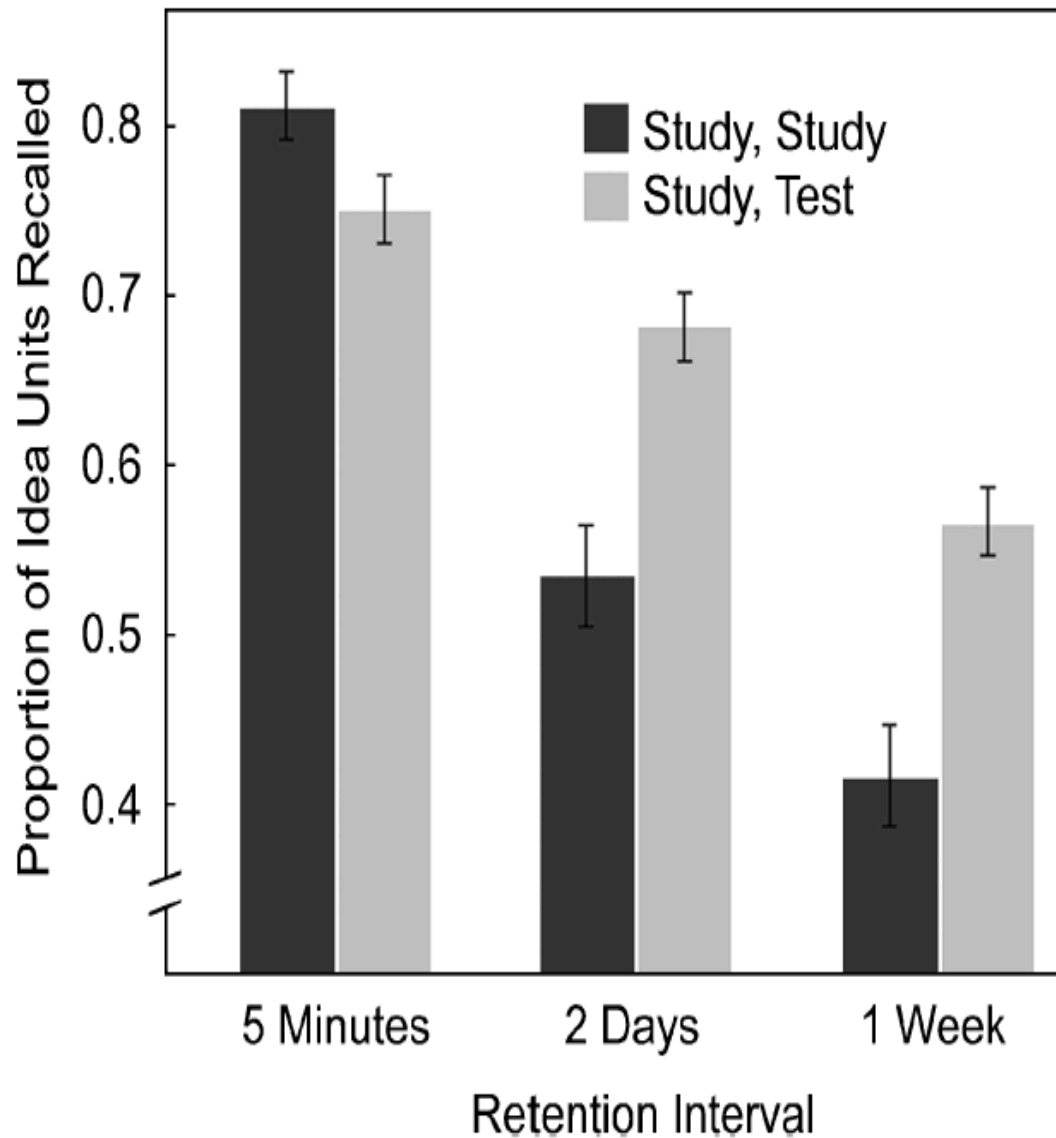
Source:
Goossens et al., 2012

- Chair – dog
- Tree – barber
- pen – bus



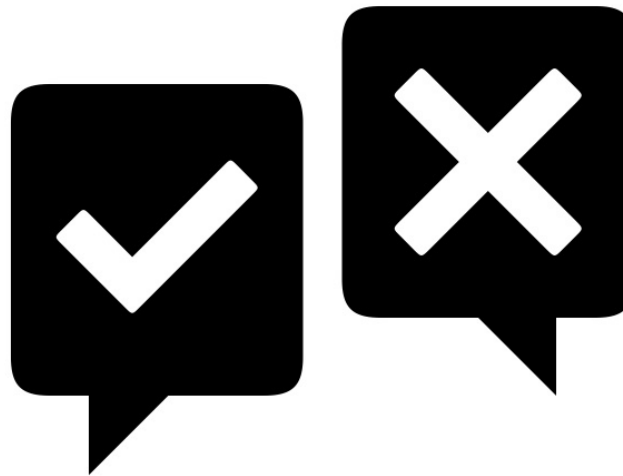
- Chair – dog
- Tree – barber
- pen – bus

- Chair – d..
- Tree – b..
- pen – b..



**Source:
Roediger &
Karpicke,
2006**

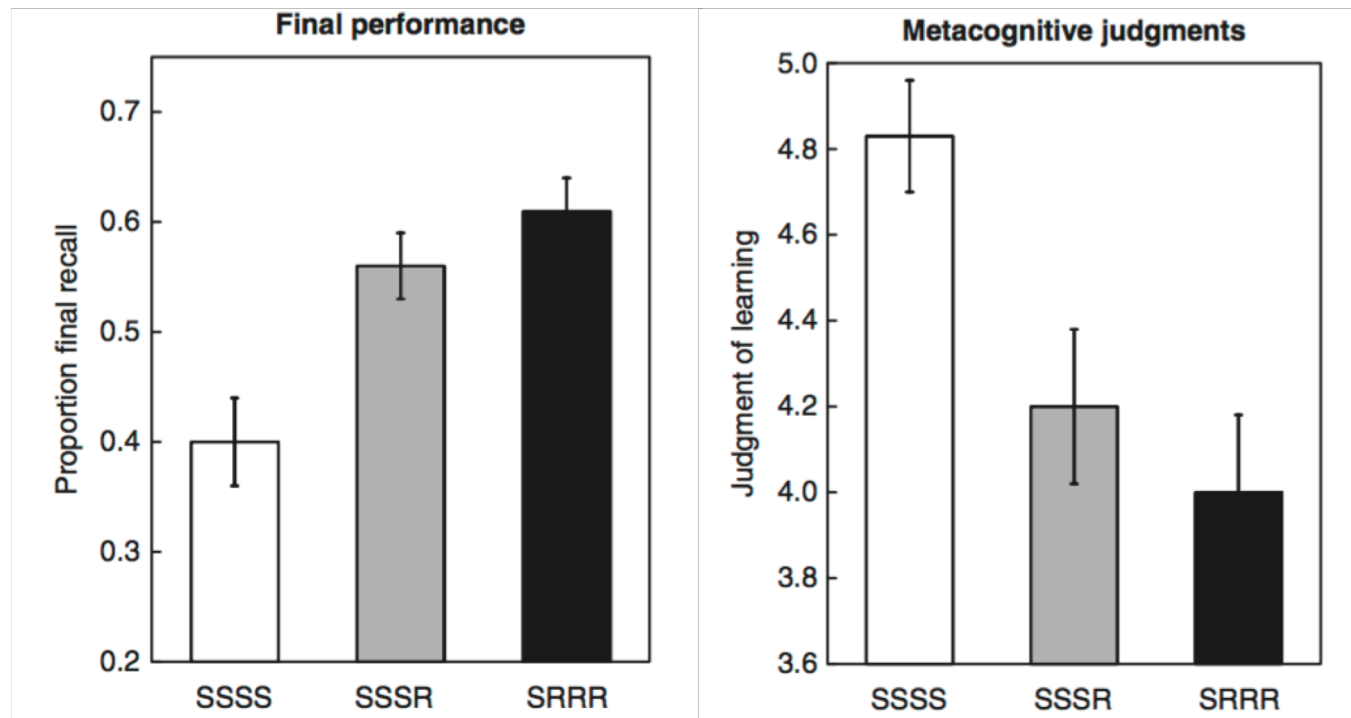
EXPERIENCED LEARNING differs from ACTUAL LEARNING



Created by Thomas Helbig
from Noun Project

EXPERIENCED LEARNING differs from ACTUAL LEARNING

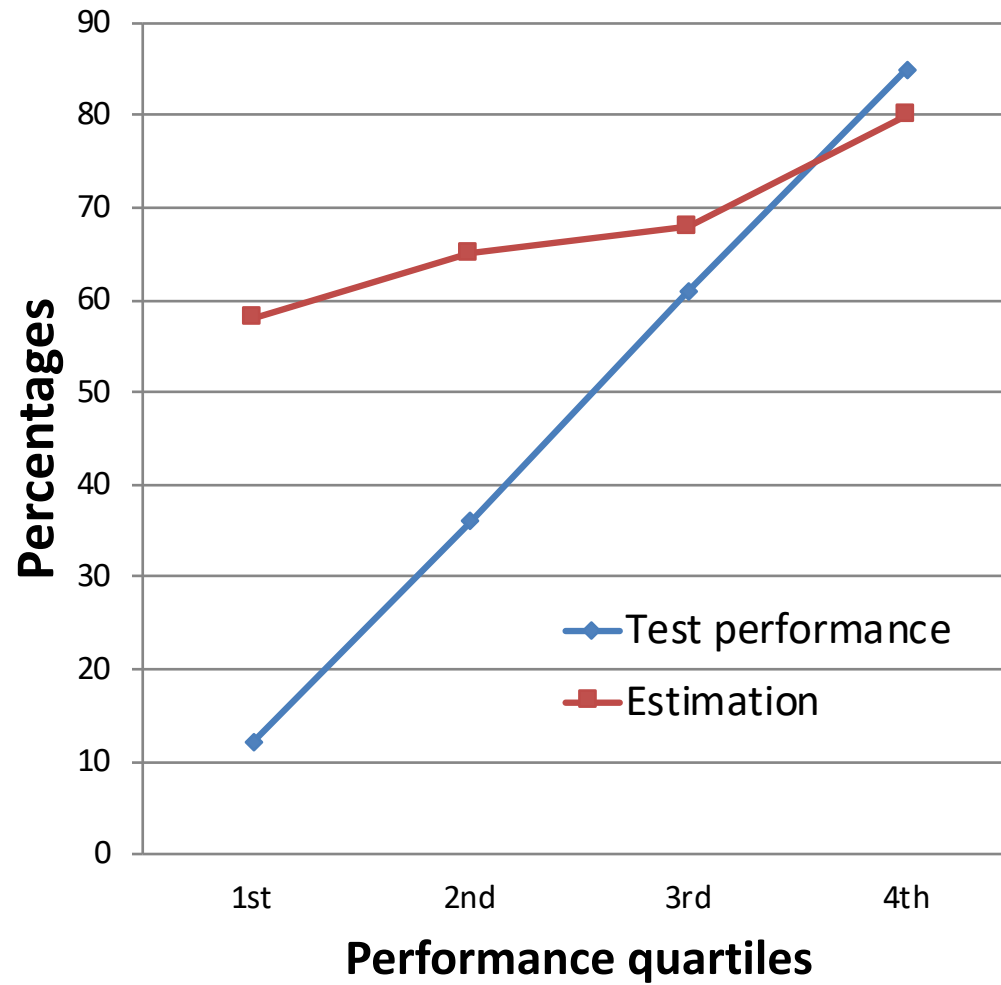
Study versus practice test (retrieval)



Source:
Nunes &
Karpicke, 2015



> 50%



The STUDY SMART training

Start BA 1 – embedded in education – peer teaching – UM wide



1. Awareness



2. Reflection



3. Practice



The STUDY SMART training

1. Awareness

Created by Ivan Colic from Noun Project

- A 2-hour session in tutorial group size;
- Video models of (in)effective learning strategies: Categorize & discuss
 - Effective strategies cost effort:
 - video & writing exercise: Think about hobby/sport & translate to learning → effort and time!
 - Take practice test



The STUDY SMART training

2. Reflection



Created by Rémy Médard
from Noun Project

A 2-hour session in tutorial group size;

- Learning strategy & achievement motivation questionnaire:
Self-score & discuss with peer
- Photo log: Show how/where you study
- Discussion about how to implement the strategies
- Learning strategy goal setting (SMART): What would you like to change/continue?



The STUDY SMART training

3. Practice



A 2-hour session in tutorial group size;

- Practice with two learning strategies and compare: Practice testing and highlighting
 - Students read two (short) texts under one of two instructions and take a test → What did you notice?

NOTE! No short term learning effect of practice testing!



Learning strategy change – a behavioral approach – Effort & habit

Felicitas Biwer

How does
knowledge and use
of strategies change
through training?



Sanne Rovers

How do students
actually use
learning
strategies?



Luotong Hui

What techniques foster
learning strategy
behavior change?



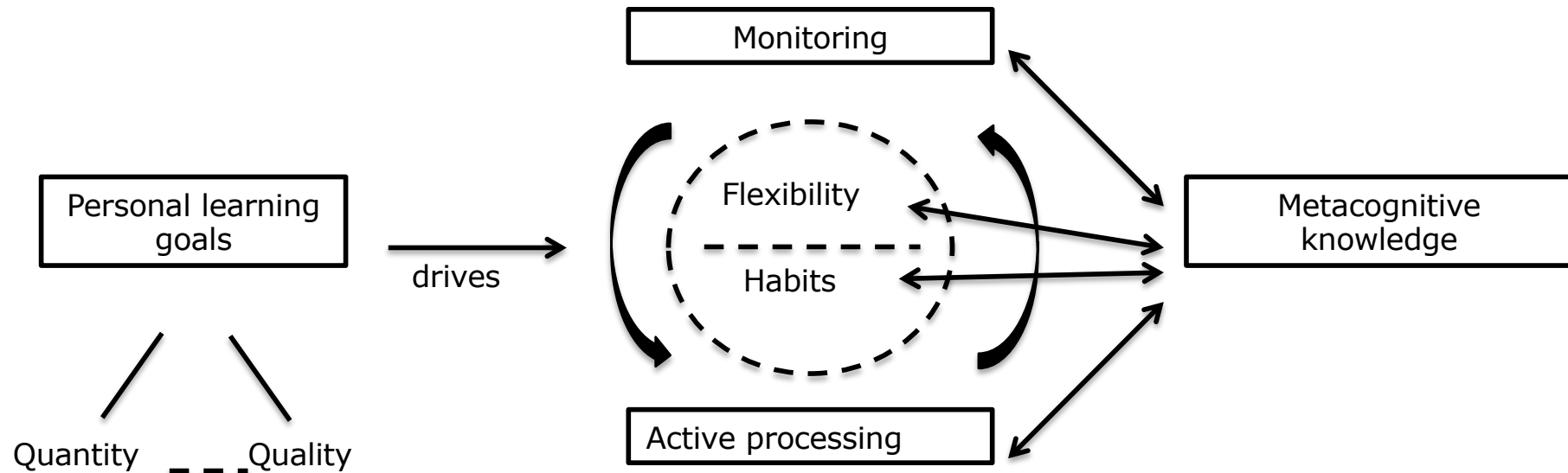
Method

Purposeful sampling through mentors

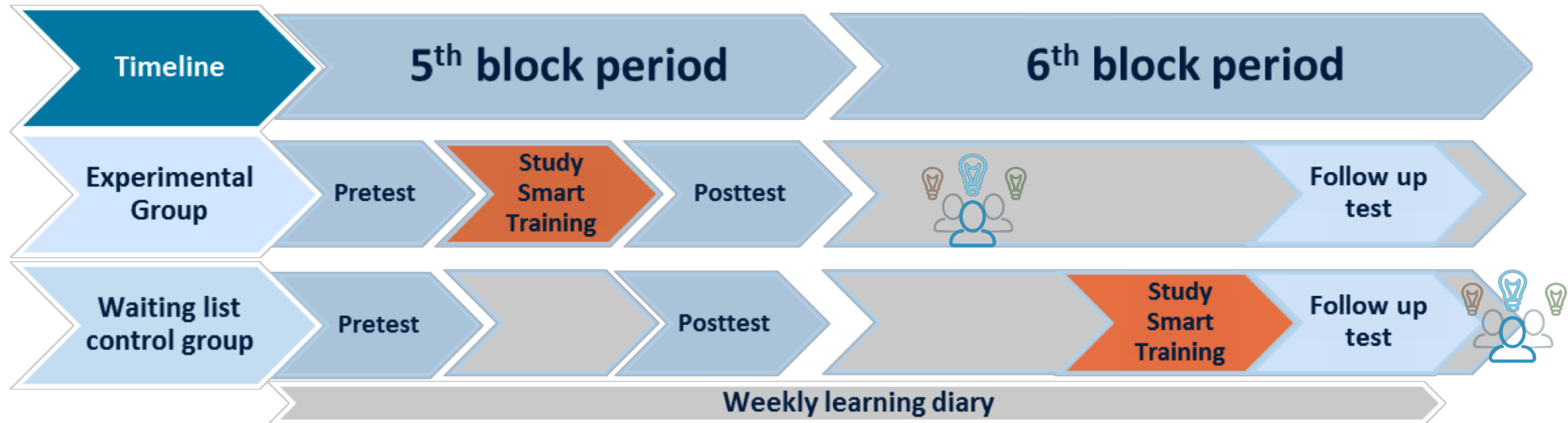
- Effective learning strategies
- 42 students indicated by 16 mentors
- N = 26
- 4 focus groups, second meeting 2 months later
- Analysis
 - Literal transcription
 - Thematic content analysis



Results

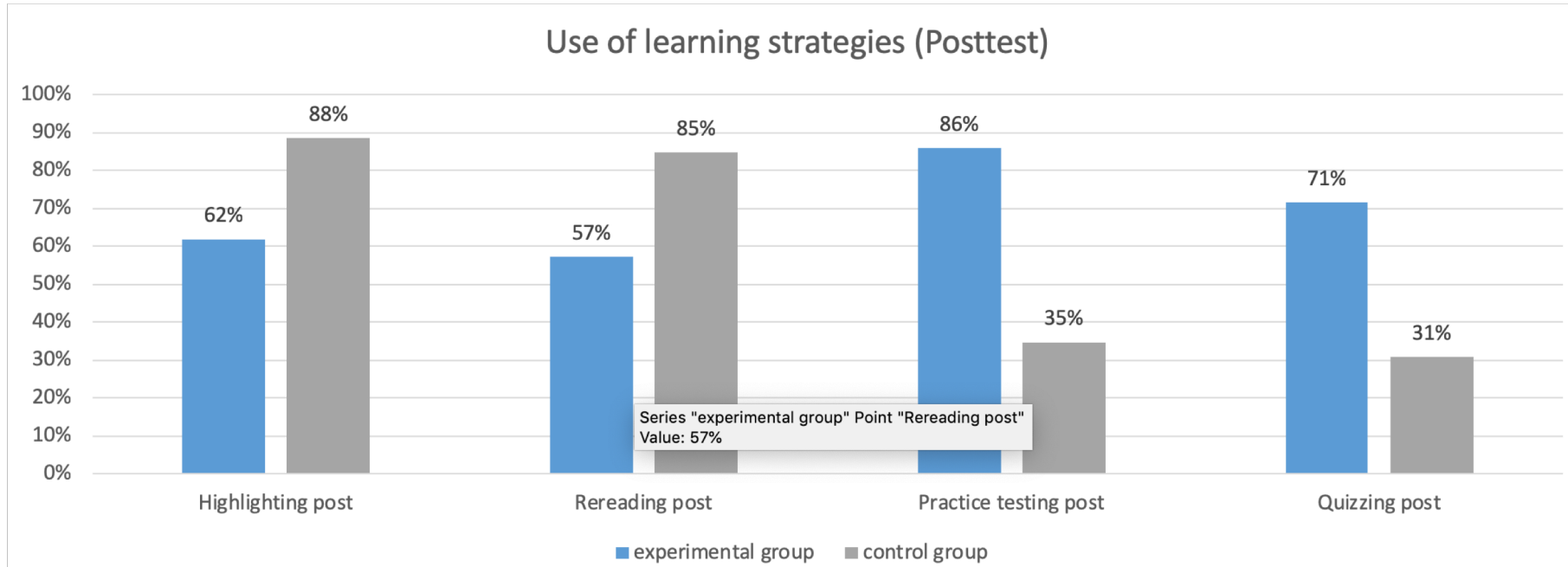


Study Design



- 60 first and second year students from FHML (Intervention-control research with 2 groups)
- Explanatory mixed-method design with focus groups





Method

Experimental study – 3 conditions

- Narrative video (N = 40)
- Nonnarrative video (N = 39)
- Control video (making a box, N = 40)



1. Effective learning strategy information

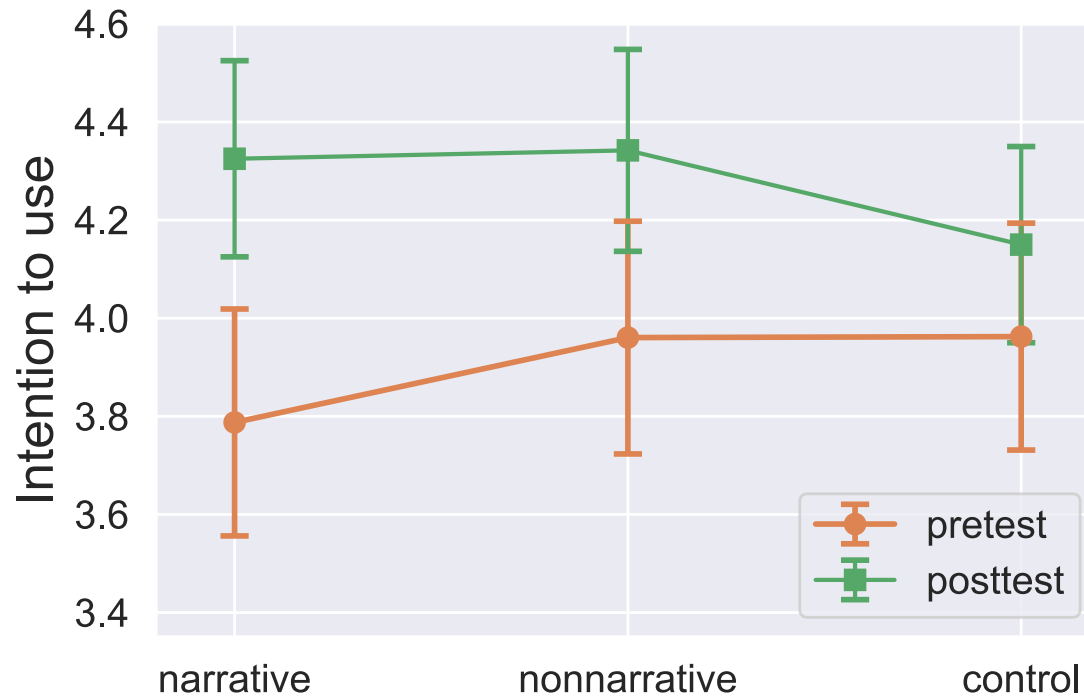
2. Non/narrative/control video

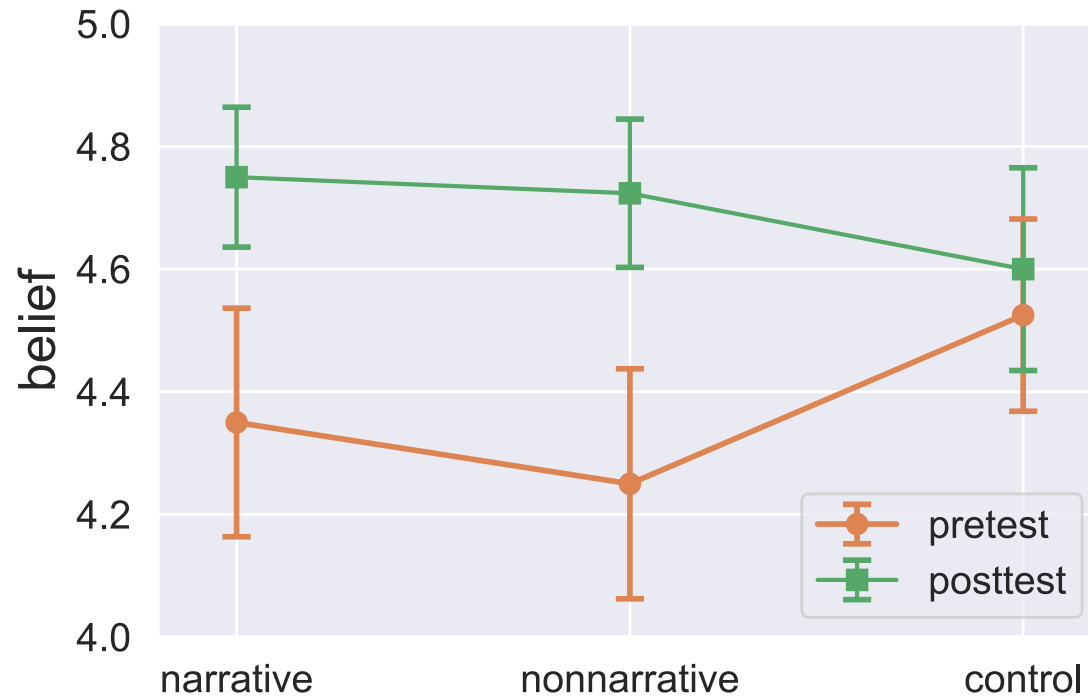
3. Dependent variables:

- Intention to change
- Belief change
- Learning strategy knowledge



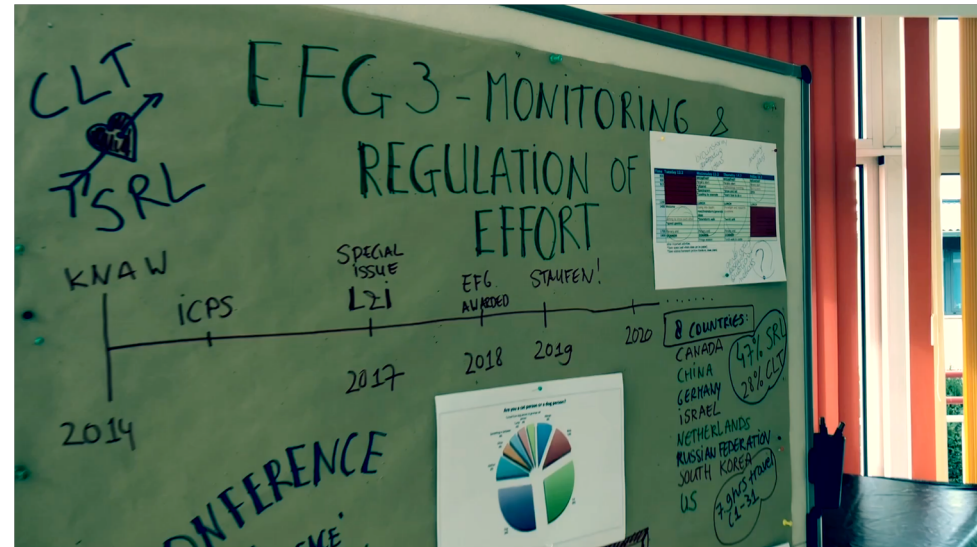
narrative Linda
Unlisted





Next steps:

- ✓ from self-report to behavioral measures
- ✓ measuring effort regulation on effective strategies - EARLI Emerging Field Group



In conclusion

- Time to tackle the blind spot!
- Fundamental research & practical implementation
- Behavior change research and
- Effort regulation research is crucial to understand how to sustainably change learning strategy use
- Check out twitter, blogs, etc. about the science of learning





Thanks to

Felicitas Biber – Sanne Rovers –
Luotong Hui - Gino Camp – Walter
Jansen – Pauline Aalten – Irma Kokx
- Mirjam Oude Egbrink – Jeroen van
Merriënboer - Harm Hospers – SRL
EDLAB project team

Thanks for your attention!

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