Effects of electronic outlining on students' argumentative writing performance

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"Writing is easy. All you do is stare at a blank sheet of paper until drops of blood form on your forehead."

Gene Fowler (1890-1960)

Example of an outline
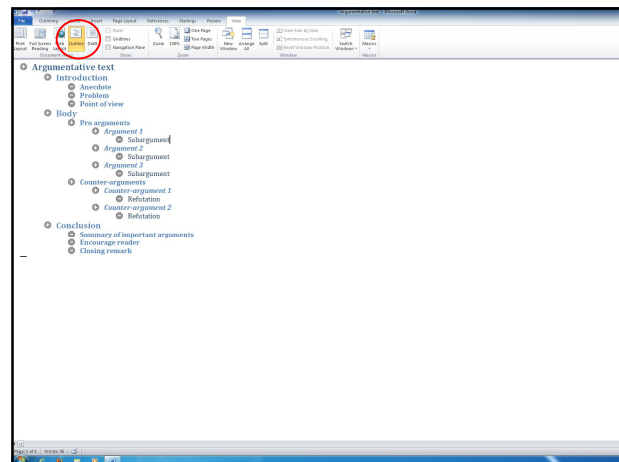
Previous research
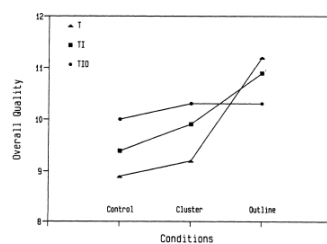
Outlines help improving overall text quality.

Outlines decrease cognitive load while writing

Kellogg (1988, 1990)

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Why this research?

- Importance of writing in society and education
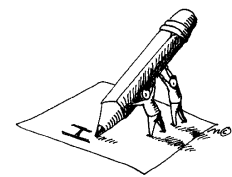
- Daily use of computers

- Many functions are left unexplored

- Electronic outlining has received little attention

Research questions

1. What is the effect of an electronic outline tool on students' writing products?
2. What is the effect of an electronic outline tool on students' perceived mental effort?
3. What is the effect of repeated use of the outline tool?

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Method

- 34 students in 10th grade
- 2 argumentative texts
- Within-subjects & between-subjects design

	Task 1	Task 2
O-O+ Condition (N = 18)	No tool	Tool
O+O+ Condition (N = 16)	Tool	Tool

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Tool instruction

- 10 minutes instruction on outline tool
- Training restricted to technical use and not on how to use outlining for argumentative writing

  ◊ **Our house**
    ◊ *Downstairs*
      ▭ Corridor
      ◊ Living room
        ▭ Sofa
        ▭ Easy chair
        ▭ Television
        ▭ Coffee table
      ▭ Dining room
      ▭ Kitchen
    ▭ *First floor*
    ▭ *Attic*

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Writing task

- Written instruction
- 15 minutes
  - 15 minutes outlining
  - 60 minutes elaboration

- Evaluation of text quality
  - Text structure ($r = 0.84$)
  - Structure presentation ($r = 0.87$)
  - Elaboration of argumentative structure ($r = 0.35$)

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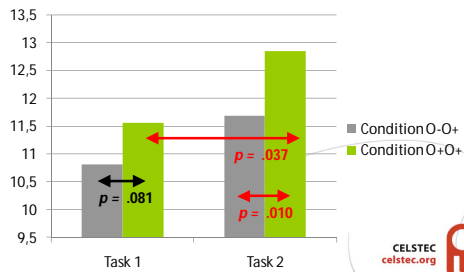celstec.org

Cognitive load

- Subjective 5-point Likert scale for cognitive load
  Paas (1992)

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Results

- Students do not spontaneously use the outline tool
- Students quickly appropriate the outline tool
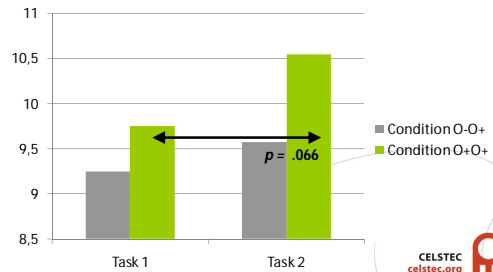- The outline tool improves quality of text structure

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Results

Structure elaboration

Condition O-O+
Condition O+O+

$p = .081$
$p = .037$
$p = .010$

Task 1 Task 2

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Results

Structure presentation

Condition O-O+
Condition O+O+

$p = .066$

Task 1 Task 2

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Results

- Students do not spontaneously use the outline tool
- Students quickly appropriate the outline tool
- The outline tool improves text structure
- Students experience less cognitieve load during writing

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Results

Cognitive load

Condition O-O+
Condition O+O+

$p = .008$
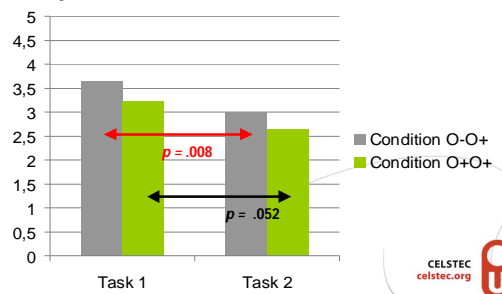$p = .052$

Task 1 Task 2

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Results

- Students do not spontaneously use the outline tool
- Students quickly appropriate the outline tool
- The outline tool improves text structure
- Students experience less cognitieve load during writing
- Positive effects on writing products are more prominent for repeated tool-use

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Future research

- Expand design: condition without outline tool (O-O-)
- Focus on writing proces (Inputlog)
- More objective measure for cognitive load
- Improve text evaluation

More information?

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- De Smet, M. J. R., Broekkamp, H., Brand-Gruwel, S., & Kirschner, P. A. (2010). Betere teksten dankzij 'outline-tool'. *Didaktief, 40*(10), 40-41
- De Smet, M. J. R., Broekkamp, H., Brand-Gruwel, S., & Kirschner, P. A. (2010). Outline-tool helpt om beter te leren schrijven. *OnderwijsInnovatie, 12*(4), 32-34

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