

Evaluation of information while searching on the Internet: Differences between experts and novices

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Evaluation of information while searching on Internet: differences between domain experts and novices

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Internet and education

- Assignments in education are often information-based problems

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behavior while searching the internet

Research reveal:

- Students have difficulties with selecting information from multiple documents due to the use of superficial criteria when evaluating hitlist, websites and information.

Bråten, Strømø, & Britt, 2009; Britt & Aglinskas, 2002, Metzger, Flanagan & Zwarun, 2003; Lundeberg, 1987; Rouet, Britt, Mason, & Perfetti, 1996; Walraven, Brand-Gruwel & Boshuizen, 2010; Wineburg, 1991

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Criteria for evaluating information and sources

- Usefulness
 - connection to the task,
 - comprehensibility
 - language
 - structure of the information
 - amount of information
- Reliability
 - kind of information / source
 - author
 - reputation
 - topicality
 - familiarity
 - goal of the information / site
- Technical
 - speed
 - place in hitlist
 - appearance



Research questions

- What evaluation criteria do domain novices and domain experts use when solving an information-based problem?
- Is there a relation between the use of criteria and the quality of the selected information?
- What is the role of domain knowledge in this process of evaluating and selecting information?



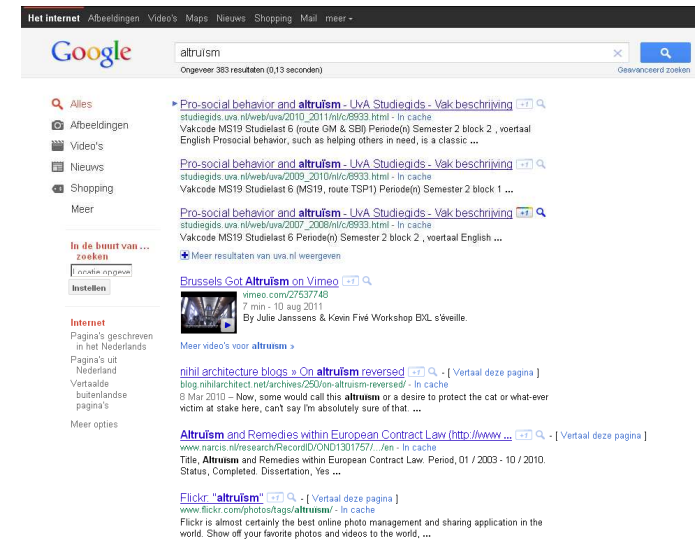
Method: participants

- Domain novices
 - 20 first years psychology students (12 men and 8 women; age $M = 20.2$, $SD = 4.07$)
- Domain experts
 - 17 university teachers of a psychology faculty (7 men and 10 women; age $M = 39,5$, $SD = 12.33$)



Method: task

- Select and rank the best five sites you can use to write an article of about 1200 words for a popular psychology magazine on
 - Altruisme
 - Reliability of human memory
- Google-like result page (SERP) with 17 links (offline)
- 10 minutes



Method: eye-tracking

Het Internet [Afbeeldingen](#) [Maps](#) [Nieuws](#) [Video](#) [Gmail](#) [meer](#) [Aanme](#)

Google [Geavanceerd zoeken](#)
[Voorkeuren](#)

Doorzoek: het Internet pagina's in het Nederlands pagina's uit Nederland

Het Internet Resultaten 1 - 10 van circa 1.900.000 voor **klimaat nederland** (0,25 seconden)

Nederland - 3 [Wikipedia](#)
Nederland heeft een gematigd zeeklimaat met milde winters en koele zomers. Het klimaat wordt beïnvloed door de aanliggende Noordzee die het gehele jaar de ...
nl.wikipedia.org - 137k - [In cache](#) - [Gelijkwaardige pagina's](#)

Klimaat - 25 [Wikipedia](#)
KNMI: Klimaat van Nederland - NLweer.com het dagelijkse weer en het klimaat in Nederland van 1901 - Klimaatportaal van het PCCC - KMI - Klimaat ...
nl.wikipedia.org - 33k - [In cache](#) - [Gelijkwaardige pagina's](#)

Het weer in klimaat in Nederland
concrete klimaatgegevens voor Nederland. El Niño & La Niña, Extreem weer, ijsheiligen, klimaat, midden van het land, neerslag in Nederland, noordkust, ...
home.planet.nl - 92k - [In cache](#) - [Gelijkwaardige pagina's](#)

Het klimaat van Nederland
Het klimaat in Nederland valt onder het Cf klimaat wat inhoud dat het een gematigd regenrijk klimaat is, zonder een uitgesproken droge tijd. ...
home.hetnet.nl - 17k - [In cache](#) - [Gelijkwaardige pagina's](#)

KNMI: Klimaat van Nederland
Klimaat van Nederland. Het weer is in Nederland vaak onderwerp van gesprek. Dat is niet verwonderlijk, immers in Nederland is het weer bijzonder ...
www.knmi.nl - 19k - [In cache](#) - [Gelijkwaardige pagina's](#)

[De website van het KNMI](#)
Weer, klimaat en seismologie. Nieuws, vragen, webcams, verwachtingen en waarschuwingen.
www.knmi.nl - 34k - [In cache](#) - [Gelijkwaardige pagina's](#)
[[Meer resultaten van www.knmi.nl](#)]

Deltawerken - Het klimaat in Nederland
Nederland bezit een gematigd regenklimaat, Cfb volgens de indeling van Köppen. Het klimaat in Nederland wordt vooral bepaald door de ligging aan zee. ...
www.deltawerken.com - 7k - [In cache](#) - [Gelijkwaardige pagina's](#)

Gesponsorde Koppelingen

Weer Nederland
Selecteer het land of de stad en bekijk gratis het weerbericht.
[www.google.nl](#)

Klimaat Nederland
Nu: **Klimaat Nederland**
Inclusief Montage & BTW v.a. € 10!
[www.Airco-Unie.nl](#)

Klimaat nederland
Aanbiedingen, reiservaringen, info. Alles over **Nederland**. Ontdek zelf!
[www.pagango.nl/Nederland](#)

[Uw bericht hier?](#)

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Method: cued retrospective report

- Looking at their eye-movement on half speed
- 20 minutes of recall
- Telling all their thoughts

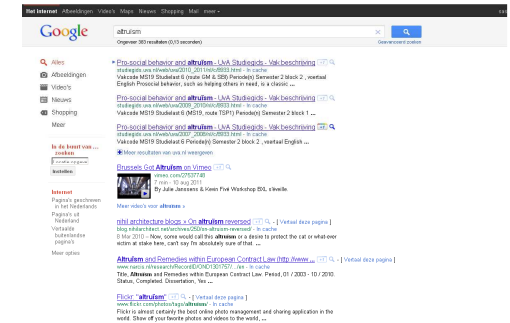


Method: variables

- Evaluation criteria: protocol analysis using a system based on earlier studies by Walraven, Brand-Gruwel and Boshuizen (2010) and Brand-Gruwel, Wopereis and Vermetten (2005)
- Quality of the selected information: Format for scoring the quality of the ranked sites



Results: Use of criteria - hitlist



	Domain Experts (N=17) Mean (SD)	Domain novice (N=20) Mean (SD)
HITLIST		
Usefulness		
1. Expected connection with the task (specific evaluation)	4.12 (3.22)	3.00 (2.32)
2. Comprehensibility	0.06 (0.24)	0.25 (0.44)
3. Usage of language (popular, scientific) *	0.00 (0.00)	0.30 (0.57)
4. Language (English, French etc.)	0.24 (0.44)	0.15 (0.37)
5. Amount of information	0.12 (0.33)	0.00 (0.00)
Reliability		
1. Reputation	1.29 (2.80)	0.65 (0.88)
2. Format of the source (Site / pdf / ppt etc.)	0.35 (0.61)	0.20 (0.41)
3. Kind of source: Primary/secondarily/tertiary	2.24 (2.49)	1.95 (2.19)
4. Topicality	0.12 (0.33)	0.00 (0.00)
5. URL	0.88 (1.17)	0.95 (1.10)
6. Familiarity *	1.18 (1.33)	0.55 (0.83)
Technical: Place in hit list *	0.06 (0.24)	0.70 (1.13)



Results:

Use of criteria - information



	Domain Experts (N=17) Mean (SD)	Domain novice (N=20) Mean (SD)
INFORMATION		
Usefulness (global evaluation)	0.65 (0.93)	0.25 (0.55)
1. Expected connection with the task	9.00 (3.00)	9.15 (5.27)
2. Comprehensibility	0.88 (1.17)	0.90 (0.97)
3. Usage of language	0.35 (0.61)	0.10 (0.31)
4. Structure of information	1.76 (1.44)	1.50 (1.64)
5. Amount of information	0.29 (0.69)	0.15 (0.37)
Reliability (global evaluation)	0.23 (0.44)	0.25 (0.64)
1. References / Links	0.53 (0.80)	0.50 (0.76)
2. Information is found on more sites	0.41 (0.87)	0.45 (0.69)
3. Info. connected to prior knowledge	0.82 (0.95)	0.45 (0.76)
4. Topicality	0.59 (0.80)	0.50 (1.00)
5. Kind of information (newspaper, blog etc.) *	0.29 (0.59)	1.30 (1.53)
6. Goal of the information	0.35 (0.49)	0.15 (3.7)



Results:

Use of criteria - site



SITE	Domain Experts (N=17) Mean (SD)	Domain novice (N=20) Mean (SD)
Usefulness (global evaluation)	0.53 (1.18)	0.00 (0.00)
1. Public	0.06 (0.24)	0.30 (0.57)
3. Language	0.12 (0.33)	0.35 (0.67)
4. Structure	0.06 (0.24)	0.05 (0.22)
Reliability (global evaluation)	0.53 (0.87)	0.20 (0.41)
1. Reputation *	2.53 (2.81)	1.30 (1.30)
2. Format of source (Site / pdf / ppt etc.)	0.35 (0.86)	0.25 (0.44)
3. Kind of source: Primary / secondarily *	1.65 (0.99)	1.00 (1.30)
4. Topicality	0.47 (0.72)	0.20 (0.52)
5. URL	0.18 (0.40)	0.40 (0.68)
6. Familiarity *	0.65 (0.79)	0.20 (0.52)
Technical: Appearance *	0.12 (0.33)	1.10 (1.71)
Technical: Speed of site	0.29 (0.47)	0.20 (0.41)



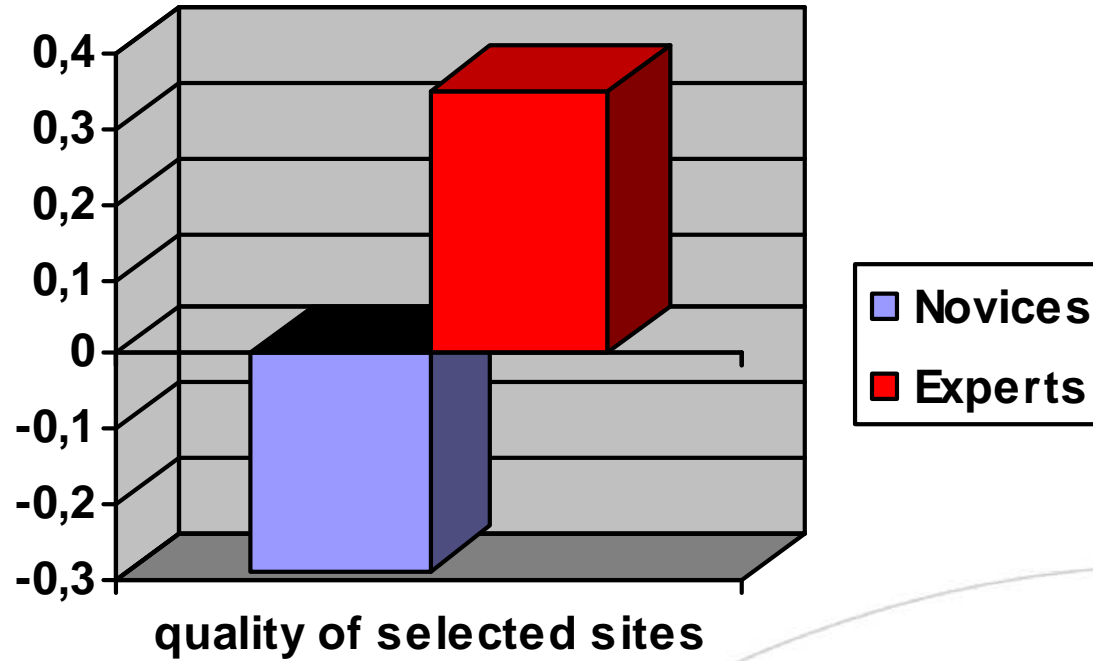
Results

Overview use of criteria

Evaluations	Domain Experts (n=17) Mean (SD)	Domain Novices (n=20) Mean (SD)
Superficial evaluations Hits	2.29 (2.26)	2.85 (3.05)
Superficial evaluations Information	1.53 (1.18)	2.70 (3.06)
Superficial evaluations Site [†]	0.82 (1.07)	2.75 (3.04)
Evaluation Usefulness Hits	4.94 (3.09)	3.85 (2.39)
Evaluation Usefulness Information	13.59 (4.95)	12.45 (6.57)
Evaluation Usefulness Site	0.76 (1.30)	0.70 (1.03)
Evaluation Reliability Hits	6.29 (6.08)	4.40 (4.04)
Evaluation Reliability Information	3.24 (1.71)	3.60 (3.20)
Evaluation Reliability Site [†]	6.35 (3.67)	3.55 (3.02)

Results:

Quality of selected information / sites



Results: evaluation behavior and quality of selection

Evaluation of reliability of sites

$r = .35$ ($p = .016$)

Superficial evaluation of information

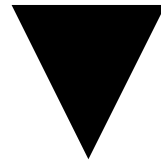
$r = -.61$ ($p = .000$)

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Conclusion / Discussion

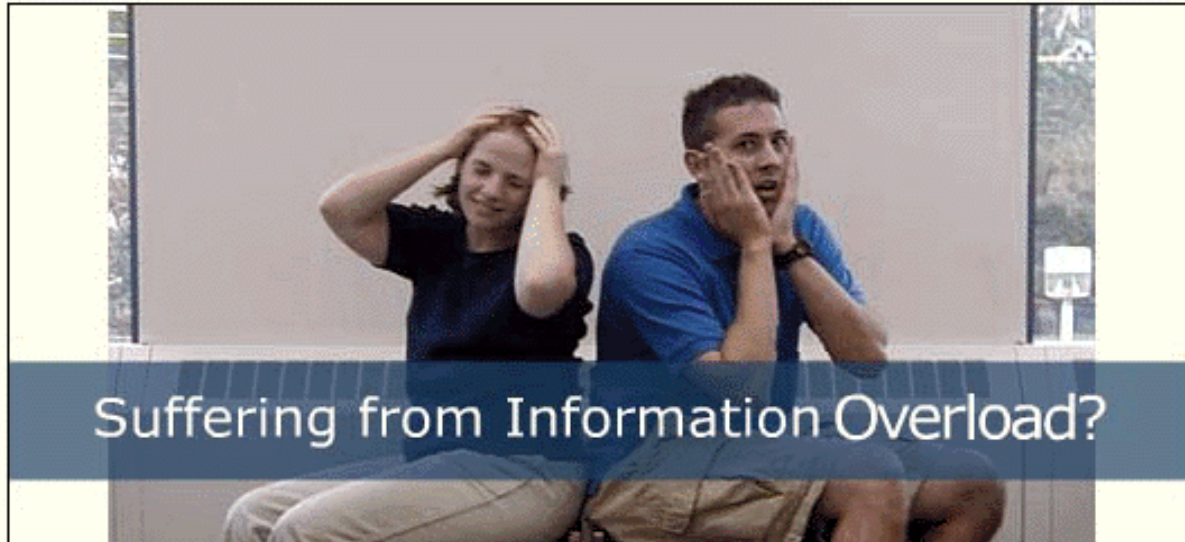
Evidence for the relation between evaluation
behavior and the quality of selected information.



Implications for education

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Suffering from Information Overload?

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