Teenagers and teachers’ information searching behaviour: a meta-evaluation of simulated work task situations in the school context

Pia Borlund (e-mail: pia.borlund@hum.ku.dk)

Royal School of Library and Information Science
University of Copenhagen
Aalborg branch

Outline:

• **Background** – the test instrument of a simulated work task situation
• **Methodology** – a study of users’ information searching
• **Results** – search patterns
• **Concluding remarks**
Background (1/5):

Today’s presentation forms part of the REX project (Retrieval Evaluation in conteXt)

The purpose of the REX project is to:
- refine and improve the requirements for the use of simulated work task situations
- increase the research standard of empirical interactive information retrieval (IIR) studies, and
- qualify the knowledge base of empirical IIR research

Background (2/5):

A simulated work task situation is a short ‘cover story’ – a description of a scenario that invites the test participant to search for information

A simulated work task situation serves 2 main functions, it: triggers the simulated information need is the platform against which situational relevance is assessed

Simulated work task situations are used to ensure the study realism as well as experimental control
Background (3/5):

Example of simulated work task situation:

Studies show that it is easier to get a job after graduation if you have had a relevant student job alongside your studies. You would therefore like to check out whether there are any available student jobs that can help develop your qualifications, and thereby improve your chances of getting a job when you have earned your degree.

Tailored for university students
(Study by Borlund, paper under review)

Background (4/5):

The requirements for the use of simulated work task situations:

• To tailor the simulated work task situation to the test participants:
  • a situation the test participants can relate to and identify themselves with;
  • a situation the test participants find topically interesting, and
  • a situation that provides enough imaginative context in order for the test participants to be able to apply the situation

• To include test participants’ personal information needs as baseline
• To rotate the order of simulated work task situation and personal information needs (counterbalancing)
• To pilot test prior to actual testing (often more than once)
• To display the used simulated work task situations when reporting the study
Background (5/5):

Motivation for today’s presentation
The citation study (Borlund & Schneider, 2010) shows that simulated work task situations are used to:

• reflect different types of information needs (e.g., Craven, 2003; Joho & Jose, 2005; Pansanato & Forte, 2007; Toms et al., 2007; White et al., 2008)

• with different user groups (e.g., Blomgren et al., 2004; Craven, 2003; Larsen, 2002; Nielsen, 2004; Petrelli et al., 2004; Skov & Ingwersen, 2008; White et al., 2008)

To date simulated work task situations have been validated only for topical exploratory searching conducted by university students (e.g., Borlund, 2003)

Objective:
How to frame different types of information needs in simulated work task situations

Outline:

✓ Background – the test instrument of a simulated work task situations

✓ Methodology – a study of users’ information searching

✓ Results – search patterns

✓ Concluding remarks
Methodology (1/5):

- The study was conducted at a Danish boarding school
- November 11 to December 3, 2013
- 31 test participants – 25 teenagers (age 14-17) and 6 teachers
- They searched one at a time – no time restriction
- 3 simulated work task situations, 1 personal information need (rotated)
- All test participants received 2 tickets to the cinema – after testing
- Data collection methods:
  - Pre-search questionnaire
  - Logging of information search interaction (Morae, www.techsmith.com)
  - Post-search interviews

Methodology (2/5):

The simulated work task situations reflect 3 different types of information needs identified by Ingwersen (e.g., Ingwersen, 2000):

- **Verificative information need**
  - searching for a specific piece of information (fact-oriented)

- **Conscious topical information need**
  - finding information on a topic you are familiar with

- **Muddled topical information need**
  - the exploration of a topic unknown to you
Methodology (3/5):

Teenagers:
Verificative simulated work task situation
Your boarding school is located in the municipality of Mariagerfjord, and the boarding school is one among several within the municipality. You know this because your school collaborates with some of the other boarding schools. But exactly how many boarding schools are there in the municipality of Mariagerfjord?

Conscious topical simulated work task situation
At the boarding school, counselling meetings are held to help you prepare for the next phase of education, when your school-life at the boarding school ends. You have all been asked to consider what you would like to do thereafter. Therefore, you should use this opportunity to search for what options and opportunities you have, given your abilities, dreams, and wishes for your future, and hereby prepare for your next meeting.

Muddled topical simulated work task situation
In May next year, you are travelling with the boarding school to Rome and Florence. You know both cities are known for their history, art, and architecture. As preparation for the trip you would like to study some of the sightseeing spots and tourist attractions in order to be able to contribute with good suggestions when planning the trip.

Methodology (4/5):

Teachers:
Verificative simulated work task situation
The University College South Denmark offers customized talks, seminars, workshops as well as continuing education on youth pedagogics with respect to pedagogical options and challenges. Perhaps it offers something of relevance to you, and you would therefore like to find the website with those offers.

Conscious topical simulated work task situation
As a teacher, you know how uplifting it can be to renew and further develop the curriculum and bring in new ways of teaching. You would therefore like to check out whether there within your subject area are new trends, themes, or ideas that could be of inspiration to your teaching.

Muddled topical simulated work task situation
The school reform is ahead and is soon to be implemented. The countdown has started. Much of the public debate concerns how to qualify the school managements to handle the reform. But the same is relevant for you.
Methodology (5/5):

Data analysis:

- **Pre-search questionnaire** – summative background information and demographics about the test participants
- **Log data** – Descriptive statistics
  - the small purposive convenience sample means the sample lacks randomness and is also vulnerable to Type II errors
- **Log data** – comparison of search behaviour based on template (Borlund & Dreier, 2014)

<table>
<thead>
<tr>
<th>Search variables</th>
<th>Verificative</th>
<th>Conscious topical</th>
<th>Muddled topical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of search terms</td>
<td>High</td>
<td>Medium</td>
<td>Low</td>
</tr>
<tr>
<td>Number of unique search terms</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Number of search iterations</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Number of 'favourites'</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
<tr>
<td>Time spent searching</td>
<td>Low</td>
<td>Medium</td>
<td>High</td>
</tr>
</tbody>
</table>

- **Post-search interview** – test participants’ perception of the simulated work task situations, satisfaction of information needs, a priori knowledge about simulated work task situations

Outline:

- **Background** – the test instrument of a simulated work task situation
- **Methodology** – a study of users’ information searching
- **Results** – search patterns
- **Concluding remarks**
Results (1/6):

- The search behaviour of the simulated work task situations and personal information needs is positively corroborated
- All test participants had searched as they usually do

...It is therefore interesting to take a closer look at how the searching of the simulated work task situations is characterised...

Table 1: Average no. of search terms over all search iterations per information need.

<table>
<thead>
<tr>
<th>Information Need</th>
<th>Teenagers</th>
<th>School teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verificative</td>
<td>Min</td>
<td>2</td>
</tr>
<tr>
<td>Conscious topical</td>
<td>0</td>
<td>2</td>
</tr>
<tr>
<td>Muddled topical</td>
<td>0</td>
<td>2.5</td>
</tr>
</tbody>
</table>

Table 2: No. of unique search terms over all search iterations per information need.

<table>
<thead>
<tr>
<th>Information Need</th>
<th>Teenagers</th>
<th>School teachers</th>
</tr>
</thead>
<tbody>
<tr>
<td>Verificative</td>
<td>1</td>
<td>1</td>
</tr>
<tr>
<td>Conscious topical</td>
<td>0</td>
<td>3</td>
</tr>
<tr>
<td>Muddled topical</td>
<td>0</td>
<td>3</td>
</tr>
</tbody>
</table>

Table 3: No. of search iterations per information need.
Results (3/6):

<table>
<thead>
<tr>
<th></th>
<th>Verificative</th>
<th>Conscious topical</th>
<th>Muddled topical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teenagers</td>
<td>Min</td>
<td>Median</td>
<td>Max</td>
</tr>
<tr>
<td>Verificative</td>
<td>0</td>
<td>1</td>
<td>2</td>
</tr>
<tr>
<td>Conscious topical</td>
<td>1</td>
<td>2</td>
<td>6</td>
</tr>
<tr>
<td>Muddled topical</td>
<td>0</td>
<td>3</td>
<td>7</td>
</tr>
<tr>
<td>School teachers</td>
<td>Min</td>
<td>Median</td>
<td>Max</td>
</tr>
<tr>
<td>Verificative</td>
<td>1</td>
<td>1.5</td>
<td>4</td>
</tr>
<tr>
<td>Conscious topical</td>
<td>1</td>
<td>4.5</td>
<td>8</td>
</tr>
<tr>
<td>Muddled topical</td>
<td>1</td>
<td>2.5</td>
<td>4</td>
</tr>
</tbody>
</table>

Table 4. No. of favourites made in Explore as indication of positive relevance assessment per information need.

<table>
<thead>
<tr>
<th></th>
<th>Verificative</th>
<th>Conscious topical</th>
<th>Muddled topical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Teenagers</td>
<td>Min</td>
<td>Median</td>
<td>Max</td>
</tr>
<tr>
<td>Verificative</td>
<td>0:23</td>
<td>01:11</td>
<td>10:09</td>
</tr>
<tr>
<td>Conscious topical</td>
<td>00:40</td>
<td>04:46</td>
<td>22:27</td>
</tr>
<tr>
<td>Muddled topical</td>
<td>00:19</td>
<td>04:48</td>
<td>11:18</td>
</tr>
<tr>
<td>School teachers</td>
<td>Min</td>
<td>Median</td>
<td>Max</td>
</tr>
<tr>
<td>Verificative</td>
<td>03:50</td>
<td>06:43</td>
<td>11:55</td>
</tr>
<tr>
<td>Conscious topical</td>
<td>09:31</td>
<td>19:43</td>
<td>02:29</td>
</tr>
<tr>
<td>Muddled topical</td>
<td>08:20</td>
<td>12:35</td>
<td>22:05</td>
</tr>
</tbody>
</table>

Table 5: Search time spent (min:sec.) over all search iterations per information need.

Results (4/6):

<table>
<thead>
<tr>
<th>Teenagers / school teachers</th>
<th>Verificative</th>
<th>Conscious topical</th>
<th>Muddled topical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of search terms</td>
<td>4.3 / 2.8</td>
<td>2.0 / 2.9</td>
<td>2.6 / 4.1</td>
</tr>
<tr>
<td>Number of unique search terms</td>
<td>5.1 / 7.2</td>
<td>5.7 / 12.7</td>
<td>6.0 / 11.3</td>
</tr>
<tr>
<td>Number of search iterations</td>
<td>1.8 / 2.3</td>
<td>3.5 / 6.3</td>
<td>3.7 / 5.2</td>
</tr>
<tr>
<td>Number of ‘favourites’</td>
<td>1.0 / 2.2</td>
<td>2.8 / 4.7</td>
<td>3.3 / 2.7</td>
</tr>
<tr>
<td>Time spent searching</td>
<td>01:56 / 06:51</td>
<td>06:18 / 19:10</td>
<td>04:33 / 13:36</td>
</tr>
</tbody>
</table>

Table 6: Mean values of the search variables of the three types of simulated work task situations.

Summary:
- Both groups’ search behaviour differ across the three types of searches
- The two groups do also differ from each other across the three types of searches
- The teenagers spent significantly less time on searching compared to the teachers!
- Note: time spent on searching is in IIR often explained as interest (e.g., Borlund, Dreier & Byström) – however:
- Teenagers – different search style: query (via Google), then click pictures...
- Teenagers – attitude: “I don’t have to read it now, now I know where to find it...”
### Results (5/6):

<table>
<thead>
<tr>
<th>Teensagers / school teachers / Expected search pattern</th>
<th>Verificative</th>
<th>Conscious topical</th>
<th>Muddled topical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of search terms</td>
<td>H / L / H</td>
<td>M / M / M</td>
<td>H / L / M</td>
</tr>
<tr>
<td>Number of unique search terms</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
<tr>
<td>Number of search iterations</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
<tr>
<td>Number of ‘favourites’</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
<tr>
<td>Time spent searching</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
</tbody>
</table>

Legend: L=low, M=medium, and H=high

### Possible explanations:

#### Number of search terms
- Teachers’ verificative simulated work task situation may be imprecise
  - Wildemuth, Freund & Toms (2013) work with different types of fact-oriented information needs – worth considering
- Teenagers may be less conscious about the conscious topical search
- Both groups used search terms from the simulated work task situations

### Results (6/6):

<table>
<thead>
<tr>
<th>Teensagers / school teachers / Expected search pattern</th>
<th>Verificative</th>
<th>Conscious topical</th>
<th>Muddled topical</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of search terms</td>
<td>H / L / H</td>
<td>M / M / M</td>
<td>H / L / M</td>
</tr>
<tr>
<td>Number of unique search terms</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
<tr>
<td>Number of search iterations</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
<tr>
<td>Number of ‘favourites’</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
<tr>
<td>Time spent searching</td>
<td>L / L / L</td>
<td>M / H / M</td>
<td>H / M / H</td>
</tr>
</tbody>
</table>

Legend: L=low, M=medium, and H=high

### Possible explanations, continued:

#### Time spent searching
- Both groups spent most time searching the conscious topical search
  - One teenager said: “my education and future is important to me, but I don’t think it is fun...” – search persistence
  - Teachers – good-subject effect – felt they had to spent time, because it was about their teaching, and they wanted the study not to have been in vain
- Both groups did not spend most time on the muddled topical search – maybe due to lack of curiosity of the simulated work task situations
Outline:

- Background – the test instrument of a simulated work task situation
- Methodology – a study of users’ information searching
- Results – search patterns
  - Concluding remarks

Concluding remarks:

- Validation of user group is achieved by including personal information needs
- Framing of different types of information needs in simulated work task situations is compared to template of expected search behaviour
- Tailoring of the simulated work task situations is important!!
  - Even better insight about users’ information needs is necessary – e.g., interview or questionnaire
- Challenging to formulate verificative, fact-oriented simulated work task situations searches that are of interest and relevance to all
  - Be aware of different verificative simulated work task situations
- Challenging to incorporate “curiosity” in muddled topical simulated work task situations
- Limitation of study: small sample
- Future work: larger study, personal needs of all three types, and taking the lessons learned into account
Thank you for your attention!

Questions?

Acknowledgement:
Special thanks to Mariager boarding school, Head of School Klaus Rasmussen and the test participants for their efforts. This study is funded in part by the Danish Ministry of Culture (TAKT2011-072)
References (1/2):


References (2/2):


