Visualizing Online Search Processes for Information Literacy Education

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Nowadays, the web is where we most often search for information, and generalist search engines are the access point and filter that lead us in the overwhelming ocean of digital documents. One key challenge for current Information Literacy (IL) education is understanding how young people search online and interact with search engines. While algorithms grow more and more complex and efficient, research suggests that online search practices can take many different forms depending on topic, situation and searcher's expertise. When teaching IL and online search, teachers grapple with a compelling difficulty: while search *results* can be made tangible as a report or a presentation, the search *process* remains often confined to individual screens and hidden from the teacher's eye (AUTHOR et al., 2022). Research evidence also indicates that users are often unaware of their own actual search process, and post-search accounts are mostly inaccurate (Teevan, 2008). This prevents teachers from capturing "teachable moments" (Hansen, 1998) and and providing effective process-oriented feedback, which is important for the development of self-awareness and self-regulatory skills (Corral, 2017; Bruce, Edwards & Lupton, 2006). The invisibility of the search process also hinders learning from peers, as search behaviors cannot be compared and discussed.

In a research project funded by the Swiss National Research Foundation we investigated online search behaviors, and developed techniques to capture and analyze *search stories*. Search story is the digital record of the actions that a user performs to solve an online search task (Botturi et al., 2022 a). We developed a system to generate graphic and interactive visualizations of search stories to allow researchers and teachers to inspect them (Botturi et al., in press).

Between November 2022 and March 2023, 29 lower and upper secondary school classes (involving 535 students aged 12-18 and 16 teachers) participated in a two-phase IL education activity aimed at developing online search awareness and self-regulatory skills. In the first phase (1 contact hour or at home), students engaged in 3 pre-defined online search tasks. Their navigation actions were captured and visual search stories generated. The second phase (2 contact hours) started with an analysis of their own search stories in order to discuss a selection of relevant topics (e.g., the use of queries, reading time, search strategies) and included the solution of a new search task.

The activity was evaluated through an online post-session questionnaire with both closed and open items. Results so far indicate that students found the activity useful (average score 8/10); the content analysis of open answers reveals that the most appreciated learnings included reflecting on the reliability of online information, and the increased awareness that searching online is not so easy or "natural" as one might think.

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