Motivation

- Frequent switch between analog and digital materials and tools during work of knowledge worker.
- Acceptance of "switching costs" (e.g., time and resources) to perform Active Reading and related activities in preferred (analog) environment.

Research Gap

A direct comparison of users' typical Active Reading behaviours (annotating, highlighting, note-taking) and spatial organization approaches when confronted with multiple documents in analog and digital environments using a large display.

Goals

- Determining whether analog Active Reading is still more efficient than digital Active Reading using a large display.
- Gaining detailed insights on differences between analog and digital Active Reading and its subareas (annotating, highlighting, note-taking, and spatial organization).
- Improving the digital Active Reading experience.

Study Design

- 17 Participants (between-subjects design)
- 15 Documents to read
- 45 Minutes for working on the given text analysis task
- 6 Questions ending with a qualitative interview

Multi-Document Active Reading Differences

- Almost no digital highlighting.
- Similar amount of words written down.
- More analog document arrangement (along the x-/y-axis).
- More digital document restacking (along the z-axis).
- More simultaneously visible documents and more groups built in the analog setting.

Performance

- Users of the analog condition performed considerably better on the post-questionnaire, achieving higher total scores and points in relation to their response times.
- Results suggest that working with analog tools and materials does have a large effect on task performance and, therefore, is more effective.
- The visibility of documents has the most influence on the performance, especially in combination with highlighting (hypothesis).

Design Implications

- (Pre-defined) Window layouts for easier and faster window organization via drag and drop and keyboard shortcuts.
- Window grouping/categorization of different applications for applying window management operations at once to all of them.
- Quick writing mode for taking notes without the need to (re-)focus the notes document.
- Enabling keyboard shortcuts for highlighting and rough highlighting similarly like on paper.