TU Informatics

A Study of Multi-Document Active Reading in Analog and Digital Environments

Jasmin Mahler
Software Engineering & Internet Computing

TU Wien Informatics
Institute of Visual Computing & Human-Centered Technology
Research Unit of Computer Graphics
Supervisor: Univ.Ass. Dr.techn. Manuela Waldner, MSc.

Motivation

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

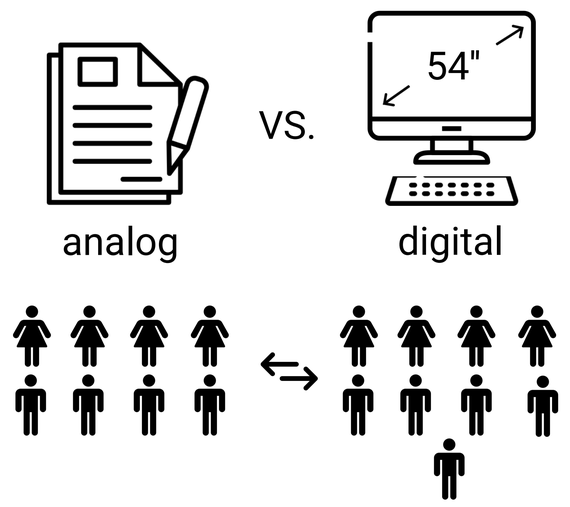
Goals

- **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

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.

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

Similiar amount of words written down

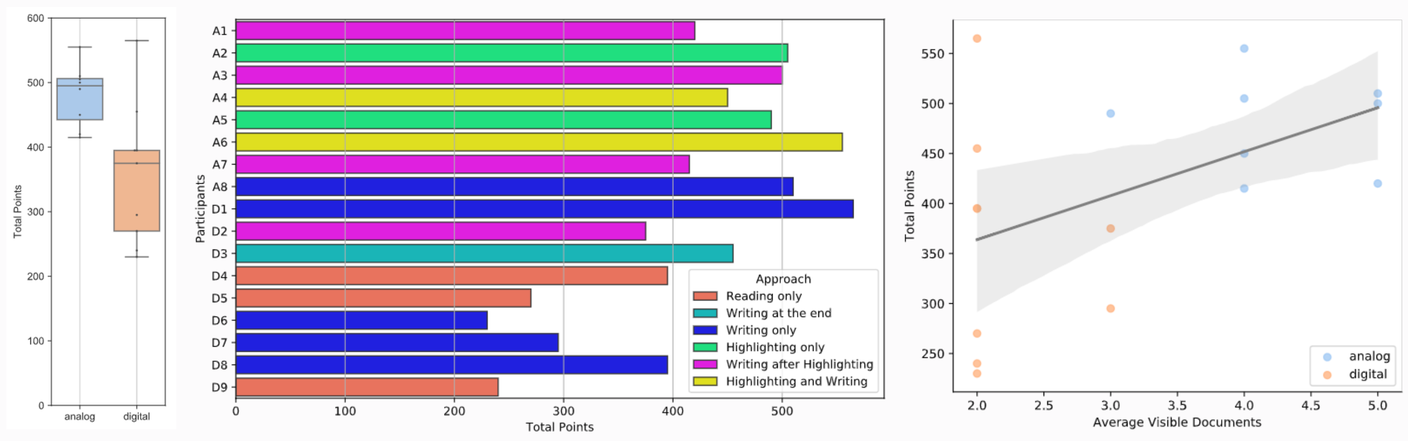
More **analog** document **arrangement** (along the x-/y-axis)

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

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