Analysis of User Feedback

# General

* Several participants mentioned the flexibility of paper as a problem when combined with the inflexible prototype.
* A small stack of paper, e.g., a printed scientific publication, is unstable when held in hand and often starts buckling. This is aggravated when the user has to hold the device and the paper stack in the same hand.
* Users mentioned the possibility of using some form of paperclip to fix the device on the paper or proposed a desk as working environment.
* Even though the mockup was only a few millimeters thick and did not have a real frame, participants already mentioned the offset and a possible loss of context when working through the device.

# Highlighting & Annotating

* Feedback was mixed for both highlighting and annotating: For some participants, these are the most important features of the prototype. Others however are less interested in this and do not see an advantage of combining digital annotations with physical, printed documents.
* The favored methods of highlighting and annotating text are also different, with some users preferring techniques known from contemporary PDF readers like word or character based marking or comment text boxes, and others opting for free-hand marking and scribbling.
* Extraction of notes was frequently mentioned, ranging from simple export or clipboard functionality to integration of some form of social network, where readers could share comments about specific parts of a document.
* One issue that several participants mentioned is keeping track of where annotations are, confirming the need for overviews of the content or off-screen visualizations.

# Showing additional media and metadata

* Most users liked the concept of linking additional media (e.g., videos) or metadata (e.g., reference list entries) to text and pictures of a physical document.
* Several participants mentioned that most of this data would have to be provided by the author, but some functionality (like showing data on a reference) could be automatically parsed from a document.
* Also, many users proposed to be able to translate individual words or look up terms in an online encyclopedia, even before they were shown this feature, thinking of it as “convenient” and “quite cool”. This serves as further confirmation that these features are important for Active Reading in a cAR setting.

# Replacing content

* Completely replacing content (instead of augmenting it) was introduced as being beyond what current display technology can achieve. Still, some insight was gained for such a scenario.
* Most participants mentioned zooming text for reading assistance as one useful feature. Others proposed an automatic translation of the text under the device. However, one participant said that such translations have poor quality and are useless to him.

# Flipping as interaction technique

* Among the features tested was flipping as a technique for mode switches, in this case between annotation/highlighting and browsing an online encyclopedia.
* No participant liked this concept. It was perceived to be unintuitive, laborious and too complicated. While this confirms our own opinions on flipping for cAR, the technical limitations of the tabletop prototype may also be a contributing factor to the users’ rejection of the concept.

# Additional features proposed

* The participant proposed several additional features. They mentioned the possibility to translate individual words or phrases, access to literature databases and also a simple reading aid for dark environments.