

# Exploring the Possibilities of Annotations in Learning Content

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Modern web based educational systems employ principles of Web 2.0, utilizing tools allowing students to actively contribute to the learning content and to personalize the content and presentation to them. One of the techniques allowing contribution to the learning content is user annotation. Besides the contribution and active participation of the student, annotations provide other several possibilities of their utilization within the educational domain.

Annotations inserted into the learning document primarily serve as learning content based feedback or a contribution to the content. They can be short comments, personal notes of a student, reports of errors or mistakes in the learning text or questions related to the document, increasing overall information value. Obvious benefit for the students is that a greater amount of the relevant information is available to them and the whole information is organized in similar manner as the original learning content (since annotations are tightly bound to the content).

Content annotations also introduce the possible interactions between students. If the students are not limited just to commenting the learning content, they would also respond to the annotations of other students. It will eventually lead to the conversations and discussions, which will be embedded in the annotations and spread through the whole learning content. Discussions will provide to students actual information about upcoming events or current activities. The concept of short discussion is similar to forums or microblogs, which are already well known and used amongst students, what will partly serve as motivation. We presume that more discussed parts of the document are more relevant and interesting to students, what we can possibly use to improve recommendation of the content [1].

By creating annotations, the student provides us information about his current activities from which we can track his progress within the course. We can compare the activities and the progress of students with each other and recommend the learning content using this data along with the content based recommendation. It would be also

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interesting to combine this information with the results of mid-term tests to discover the parts of the document, which were studied by students, who were more successful on the test, and which parts by less successful ones. We can potentially find most helpful parts of the content and recommend them to students, helping them to achieve better results.

Another possible use of user annotations, similar to previously discussed idea, is a bookmarking within the learning content. Students using annotations as bookmarks will select the parts of the textbook important to their current activities or future tasks. Such annotations can be used for browsing the content [2]. Discovering relations between bookmarks and actual tasks of a student is another possible subject of research. The association of tasks with annotations explicitly by students is unlikely to be used, since it requires additional effort from students. Using this data we can help weaker students with tasks, recommending them content, which helped other students.

Besides the comments written by students, annotations also provide another important data – selected fragments of the text, which are associated with the annotations. Since students select certain fragments to annotate them, these fragments of the learning document are presumably significant for them. When numerous students select the same fragment, it indicates that the selected fragment can be generally important within the context of the document. Such metadata can be used for searching in the course or to improve results of methods for discovering concepts from the text. Selected words can contain concepts or even be concepts themselves.

Using annotations to discover concepts and relations (and consequently creating a domain model of the course) is not limited just to the students' annotations. It can be also utilized as an interface used by an expert to select occurrences of concepts in the text and then generate the domain model. Selecting keywords within the text requires far less effort than manual specifying of the concepts and relations thus it can be useful for convenient creation of the domain model.

Primary goal of our current work is to explore possible uses of content annotations within the learning content and determine the most promising ideas of their utilization. Our aim is to reduce effort for the students and teachers, provide additional value to the students and to make learning content presentation more interactive and attractive to students.

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## References

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