

eJournalPlus: Development of a Collaborative Learning System for Constructive and Critical Reading Skills

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Abstract: The authors developed reading support software “eJournalPlus” designed to assist learners in not only reading texts but also constructing their own opinions from it. Since it is difficult for learners to reach a sufficient level of critical reading skills through reading only by themselves, a collaborative learning function was added to allow learners to share their ideas and facilitate discussion in order to assist learners in considering their own opinion more critically and promoting their critical thinking.

Introduction

Reading literacy in a knowledge society is considered to be the “understanding, using and reflecting on written texts in order to achieve one’s goals, to develop one’s knowledge and potential, and participate in society” (OECD-PISA, 2003). Elder & Paul (2004) suggested essential points for “close reading.” Those are: 1) grasping one’s own purpose in reading a text, together with understanding the author’s purpose in writing the text; 2) detecting the interconnectedness of the various ideas and parts of a text and understanding objectively the text’s meaning system; and 3) formulating questions and offering one’s own opinions about the text interactively by engaging one’s existing knowledge with the text.

Developing in this way the ability to engage in a constructive interaction with the author and the contents of the text, and not only an understanding of the text, is important for the learner. Particularly for Japan’s reading education, which focuses on the accuracy of textual understanding, designing learning environments that encourage this wider engagement is a pressing need.

Based on this conceptual foundation, the purpose of the present study is the development of software that assists the learner in developing critical reading skills that not only improve the learner’s ability to understand texts accurately and assess their logical consistency, but also help the learner to express his or her own opinions about the text in an interactive way.

Basic Functions of eJournalPlus

The eJournalPlus application has the following functions as a support system for learning critical reading skills (Oura et al., 2008).

Document underlining and comment functions

Underlining is a common reading strategy that is effective for supporting the understanding of a text (Kobayashi, 2007). To make the most of this strategy, the eJournalPlus system allows the learner to underline or draw a marker line under any passages in a text.

Knowledge map function for organizing elements of the text in idea nodes containing the underlined passages

Underlining has been demonstrated to be effective for a general understanding of a text, but electronic texts sometimes suffer from readability issues (Mills & Weldon, 1987). Related to this, it has been pointed out that the visualization of text contents is very important for deepening understanding of the text (Duke & Pearson, 2002; Spears, 2006). The eJournalPlus software allows the learner to make “knowledge map,” that is similar to argument or conceptual map, based on the passages the learner has underlined or marked. As will be described in more detail below, with the eJournalPlus software, the learner can juxtapose the target text with his or her knowledge map and, by dragging underlined passages, intuitively create idea nodes that can be dropped

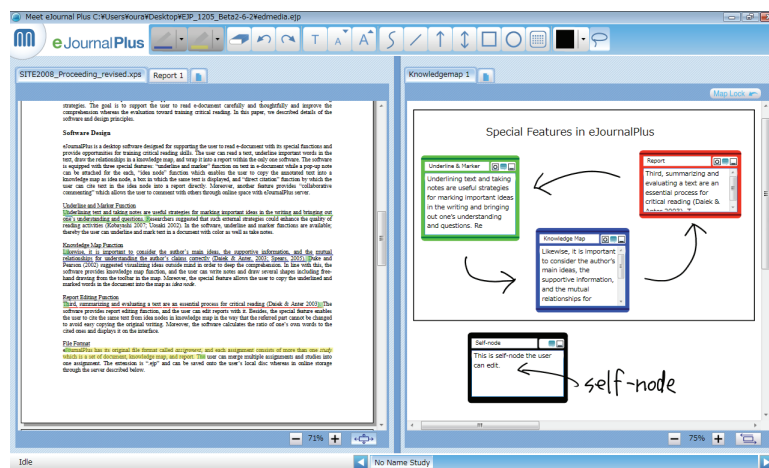


Figure 1. eJournalPlus Basic Interface (the target text (left) and its knowledge map (right))

into the adjacent area to make the knowledge map. The learner creates his/her own idea nodes and relates them to the elements on the knowledge map. The map is composed of the extracted passages from the text, so the learner can express his or her own opinions about, or interpretations, of the target text in detail. The aim of this particular function is to encourage the learner to express opinions that are based directly on the facts and essential points included in the target text.

Editor function for writing summaries and reports based on the knowledge map

Summarizing, posing questions, and expressing opinions are core activities for critical reading strategies (Daiek & Anter, 2003). Moreover, writing out or restating the main points or opinions organized in the knowledge map should promote further reflection on the part of the learner and, through that reflection, a deeper understanding of the target text.

eJournalPlus Collaborative Learning Function

Rather than a singular interpretation, the understanding of textual content is comprised of various interpretations socially arrived at through dialogue (Cambourne, 2002). It is suggested that a more constructive and critical reading of a text is promoted through a reading process and dialogue of opinions undertaken by multiple readers. Okibayashi (2004) has also shown that, assuming appropriate instructions have been given to the learners, learners can more easily apply critical thinking to a text through interactive discussion.

Thus the authors developed a function that allows communities of learners to make mutual comments during the reading and reviewing process on the knowledge maps, and final reports, which are the results of the reading process. The aim of this collaborative process is not only to promote an individual dialogue between the learner and the author of the text but also to enhance the learner's critical reading skills through dialogue with other learners.

It has been found that for online discussions using representation maps like the eJournalPlus knowledge maps, adequate discussion is difficult to achieve if the displays are different, representations cannot be directly displayed, and gestural deixis is inhibited (Suthers et al., 2003). Thus in order to allow comments to be directly displayed, the eJournalPlus system permits users to display their comments in precise locations with the system's "push-pin" interface (Figure 2, Left).

A user adds comments by the following procedure. At first the user uploads the target electronic text and his or her own knowledge map and report to the eJournalPlus server. Another learner can then open the

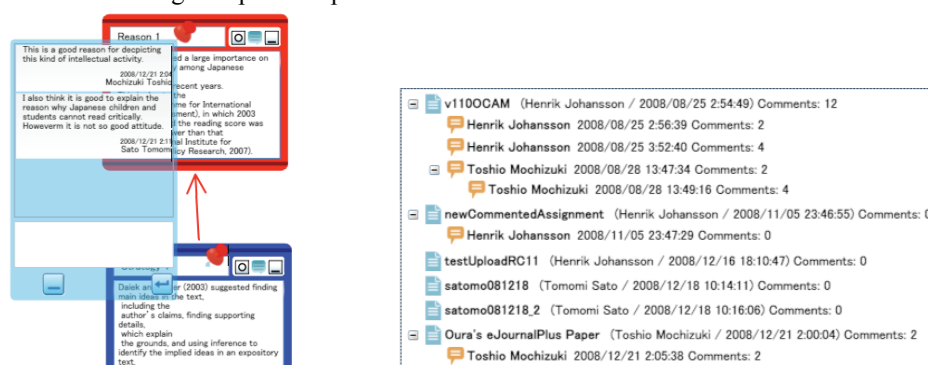


Figure 2. Push-Pin Comment Inputting (Left) and Comments on Tree Bulletin Board (Right)

published file in the comment mode and add comments by the push-pin interface, as shown in Figure 2. The file with the added comments is then uploaded again to the server. When that is done, the file is stored with the original comments and the responses to them on the tree bulletin board, an example of which is shown in Figure 2. The learner can then download the file merged with comments from other learners. Using this collaborative file, the learner can reconsider the process and results of his or her own reading, as well as the ideas and opinions the learner developed regarding the text. Since this activity is carried out collaboratively with one target text, learners should be able to enhance their constructive reading of the text contents.

Developed based on .NET Framework 3.5, the eJournalPlus Server uses Windows Server 2003, and the database is managed by Microsoft SQL Server 2008. Server clients communicate by HTTP. Electronic texts are formatted in the XPS (XML Paper Specification) format, a subset of Windows Presentation Foundation's XAML (Extensible Application Markup Language).

Summary and Future Issue

The present study explained the original design of reading support software and new functions aimed at helping learners exchange of their ideas and discussion in order to promote their critical thinking and help acquire critical reading skills. The results of evaluative testing of the basic functions of eJournalPlus show that, even when the learner is working individually, the program can assist the learner in constructive critical reading to a significant extent (Tsubakimoto et al., 2008). Through testing that also utilizes the collaborative learning function and observation of actual classroom usage of the program, the authors intend to analyze whether the eJournalPlus can enhance learners' critical reading skills.

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