Supplementing Wikis with Multimedia Collaboration Support

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Abstract. As students increasingly use wikis as online collaboration tools in various kinds of learning project, multimedia can help enrich an educational wiki system in at least two respects: its content as well as the interaction among the collaborating participants. This paper reviews some concepts on multimedia support for electronic collaboration and discusses the way forward for educational wikis.

1. Introduction

Wiki systems such as Wikipedia feature prominently in Web 2.0 which elevates the original World Wide Web to a higher level of convenient sharing and collaborative content creation. According to Cunningham, developer of the first wiki, "Wiki is a piece of server software that allows users to freely create and edit Web page content using any Web browser" [3]. Wikipedia defines wiki as "a collaborative website which can be directly edited by anyone with access to it".

Wikis have attracted much interest in their educational use (apart from many other community, enterprise, and personal uses). For instance, the Wikiversity (http://www.wikiversity.org) has been created with the following goals:

- Create and host free content, multimedia learning materials, resources, and curricula for all age groups in all languages
- Develop collaborative learning projects and communities around these materials.

Increasingly, students use wikis as online collaboration tools in various kinds of group project. For instance, Chao [4] introduced wikis to students originally for maintaining their group diaries while working on their software development projects but the students soon extended wikis' use to project planning, requirement management, project tracking, etc.

Multimedia can help enrich an educational wiki system in at least two respects: its content and the interaction among the collaborative participants. While wiki software such as MediaWiki already supports the inclusion of a variety of multimedia content including sound, images, and video, the integration of real-time multimedia collaboration support such as instant messaging and videoconferencing into educational wiki systems is, however, rare.

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This paper examines the nature of multimedia collaboration support and discusses how it can supplement wiki systems in collaboration learning environment. The next section examines wikis from the point of view of computer-supported collaboration learning and highlights the lack of synchronous communication facility in current wikis. Section 3 discusses the incorporation of multimedia collaboration support involving synchronous as well as asynchronous communication into wiki systems. Section 4 mentions some further research opportunities and section 5 gives a conclusion.

2. Computer-supported collaboration learning (CSCL)

Current wikis support collaboration mainly through the following features.

- Browser-based editing – this affords "freedom of access" according to Paulsen's theory of cooperative freedom as it removes a great deal of technical and cost barriers to accessing a wiki.
- Versoning and rollback – this lends the convenience of the "undo" facility of a stand-alone word processor to a distributed collaborative setting.
- Discussion forums – this allows participants to express and exchange opinions asynchronously and hence affords "freedom of time".

Wikis can also be regarded as a kind of computer-supported collaborative learning (CSCL) systems which enable learners to communicate ideas interactively, access information, and engage in collaborative problem-solving activities [5]. CSCL has the theoretical support of Vygotsky's sociocultural theory of learning which asserts that cognition occurs through social interaction [6].

The relative benefits of synchronous (such as instant messaging) and asynchronous (such as discussion forums) communication tools have been a major CSCL research topic and the findings seem to suggest that there are strengths and limitations to each form of communication [5].

Current wikis support communication among collaborators mainly through asynchronous discussion forums. While this may serve a community project such as the Wikipedia well, the benefits of incorporating synchronous communication into wikis for collaborative learning simply cannot be ruled out. For instance, a recent survey of student opinions conducted by the Deakin University in Australia suggested, among other things, the addition of a real time chat facility to their wiki-based e-learning environment [7].

3. Multimedia collaboration support

Bonk et al [2] designed a taxonomy of five levels of collaborative writing tools that can be used for school learning as follows:

L1: Electronic Mail and Delayed-Messaging Tools

L2: Remote Access/Delayed Collaboration
L3: Real-Time Brainstorming and Conversation
L4: Real-Time Text Collaboration
L5: Real-Time Multimedia and/or Hypermedia Collaboration.

Current wiki systems can be considered as belonging to L4 of the above taxonomy, which support real-time changes to shared documents. To attain Level 5, wiki systems should "not only foster document-sharing capabilities of Level 4, but also include one or more other collaborative features, such as hypertext, graphics, video images, music, speech, and animation" [2].

The following subsections discuss the inclusion of some of these level 5 features in wikis.

3.1 Presence tools and instant messaging

While not necessarily multimedia-based, popular presence tools such as ICQ and Windows Live Messenger are embellished with customizable, playful visual and sound effects that appeal to the attention of the participants.

Instead of relying on a separately installed program, a presence tool can now be incorporated into an ordinary webpage through Ajax technology and opened in a browser, as done by the Gmail and Yahoo! Mail services. The same principle can be applied to an educational wiki system in which participants can communicate synchronously through instant messaging.

3.2 Voice/video calls and mail

Internet telephony and videoconferencing are converging with instant messaging into synchronous multimedia communication tools such as Windows Live Messenger and Skype.

On the other hand, voice and video messages can also be communicated asynchronously through voice and video mail, which are now becoming increasingly available.

The challenge, however, is to record live audio/video conversation in a form that allows convenient retrieval and review.

3.3 File and application sharing

While many wikis support webpages with multimedia content, participants may share or exchange files and review them before publishing them. File sharing is also useful when external editors are used for collaborative editing.

Shared drawing board and multiplayer games are typical examples of application sharing that further enriches interaction among learning participants.

4. Research opportunities

Research is needed to establish the relevance of multimedia collaboration support for wikis in various learning situations and environments. Researchers may collect data on:

- Usage patterns of the support
- Modes of learning (formal, distance, or blended)
- Student attributes (age, gender, level)
- Subject attributes (problem-solving, creative writing, argumentation, etc.)
- Etc.

Interesting questions pertinent to the benefits of multimedia collaboration support for wikis include:

- Do students prefer instant messaging to discussion forums?
- How does videoconferencing enhance collaborative writing?
- How do online games enrich learning through wikis?

5. Conclusion

The author is hopeful that the multimedia collaboration support as discussed in this article will gradually appear in future wiki systems as the multimedia technology is already there waiting to be incorporated into current wiki software. However, it remains to be seen how different forms of multimedia collaboration support would fit collaborative learning and there lies a wealth of opportunities for further research.

References

1. T. Anderson, "Distance learning – Social software's killerap?", *ODLAA 2005 Conference, Adelaide Australia*, Retrieved July 23, 2007 from http://odlaa.une.edu.au/events/2005conf/nonref/odlaa2005Anderson.pdf
2. C. J. Bonk, P. V. Medury and T. H. Reynolds, "Cooperative hypermedia: The marriage of collaborative writing and mediated environments", *Computers in the Schools*, 10(1/2), pp. 79-124.
3. http://www.wiki.org/wiki.cgi?WhatIsWiki.
4. J. Chao, "Student Project Collaboration using Wikis", Proc. 20th Conference on Software Engineering Education & Training (CSEET'07), IEEE, 2007.
5. D. H. Jonassen, C. B. Lee, Chia-Chi Yang and J. Laffey, "The Collaboration Principle in Multimedia Learning", In *The Cambridge Handbook of Multimedia Learning*, Cambridge University Press, 2005.
6. L. Vygotsky, Mind in society: The development of higher psychological processes, Harvard University, 1978.

7. R. Raitman, N. Augar and Wanlei Zhou, “Employing Wikis for Online Collaboration in the E-Learning Environment: Case Study”, Proc. 3rd International Conference on Information Technology and Applications, IEEE, 2005.