Section 01

Platforms

In this section:


JALTCALL
2005
Glocalization:
Bringing
People
Together

Wikis as constructivist learning environments

Rick S. Lavin

Prefectural University of Kumamoto

Jennifer Claro

Shokei College

In this paper, we suggest that wikis deserve serious consideration as an important tool of the constructivist educator. After a brief review of Piagetian and Vygotskian constructivism, and a look at the literature on the implementation of constructivist education using technology, we adopt six recommended constructivist elements of online tools or environments (multiple modes of representation, collaboration opportunities, experience with multiple perspectives, learner centered, learner relevant, and social negotiation) and argue that wikis' fit with these elements appears to be a good one. We sketch several actual and hypothetical educational uses of wikis as illustrations of their potential, and highlight directions for future research.

構成主義を支持する者にとってWikiがいかに重要で可能性を持ったツールであるか、本論文で提案する。オンラインツールならびにオンライン環境において望ましい6つの構成主義的要素について述べ、それらの要素にWikiがいかに答えうるかについて議論を行う。教育におけるWikiの実際の使用例やその他の可能性について紹介し、今後の研究の方向性について述べる。

Introduction

For constructivist CALL practitioners, it is difficult to decide how to *do* constructivism, partly because constructivism is a theory of learning rather than of teaching, and partly because choosing suitable tools to use is problematic. In this paper, we suggest that wikis deserve serious consideration as an important tool of the constructivist educator. The structure of the paper is as follows: After brief sections describing first wikis and then constructivism, we adopt six recommended constructivist elements of online tools or environments and argue that wikis appear to satisfy them, and sketch several actual and hypothetical educational uses of wikis as illustrations of their potential.

What are wikis?

Wikis may be defined as collaboratively and incrementally updateable, radically hypertextual websites. The collaborative aspect is illustrated by the presence of an "Edit" button on most pages, visible to any authorised user, by means of which pages can be freely created and edited. (The set of authorised users can be defined to meet the needs of an individual wiki.) This button also illustrates a wiki's incremental updatability: websites can be altered directly on the web without the download-edit-upload cycles that tend to discourage minor and frequent edits of conventional websites. "Radically hypertextual" refers to the twin facts that links can be created far more easily than with conventional HTML pages, and that these links are two-way; thus it is as easy to answer the question "What refers to this?" as the question "What does this refer to?". The archetypal wiki is Wikipedia (http://www.wikipedia.org), an online encyclopedia with more than 726,000 articles (as of September 14th, 2005) in English, which allows even anonymous users to create and edit articles freely. The success of this model has led to speculation that wikis may have a major role to play in educational contexts (Godwin-Jones, 2003; Barton, 2004; Elrufaie, 2004; Lamb, 2004; Lavin, 2005).

The software used to run a wiki is termed a wiki engine. There are now several hundred wiki engines available, designed to run on a variety of software and hardware platforms. Many of them are designed for easy install and are also Open Source and generally available at no cost. Thus, there are few barriers to adoption aside from unfamiliarity, and wikis represent an accessible alternative to expensive, proprietary learning management systems.

What is constructivism?

Jean Piaget (e.g, Piaget, 1954, 2000) theorized that knowledge is actively constructed by the individual interacting with the environment, not merely transmitted to or absorbed by the learner. Knowledge does not exist independently of the knower, and the individual constructs his own system of knowledge from his own experiences. Piaget believed that we cannot know what is true, or what is "out there" in the external world, only what we accommodate into our own self-constructed knowledge (Kamii & Ewing, 1996).

Vygotskian social constructivism emphasizes the social aspects of the theory, suggesting that every function in a child's development appears first "interpsychologically" (between people) and then "intrapsychologically" (inside the child's mind). Thus, teacher and peers take on a more central role in social constructivism (Vygotsky, 1978).

Vygotsky claimed that higher mental functions are always mediated by cultural tools or artifacts. Language, computers, the Internet, and online learning environments can all be considered cultural tools that aid interaction. These do not simply facilitate mental functions, but also shape and transform them. Thus, the choice of online environments or tools is a central issue.

Implications for educators

Many sets of guidelines have been published regarding implementation of constructivist education using technology (e.g., Cunningham et al., 1993; Honebein, 1996; Hung and Chen, 2001; Jonassen, 1991, 1994; Knuth and Cunningham, 1993; Young, 2003). The SalonWiki <careo.elearning.ubc.ca/cgi-bin/wiki.pl?Salonwiki> provides the following synthesis of these guidelines:

1. Multiple modes of representation
2. Collaboration opportunities
3. Experience with multiple perspectives
4. Learner centered
5. Learner relevant
6. Social negotiation

Let us examine how well wikis meet these desiderata:

Multiple modes of representation

Arguably a major weakness of mainstream or traditional wikis is that they can handle only text, though recent wiki engines can incorporate, for example, graphics or bibliographic data. The wiki can serve as a hub to contain or reference non-textual information or representations.

Collaboration opportunities

Whereas in a discussion forum it is easy to talk about something, but not manipulate it directly, a wiki is suited to actually construct something (e.g. a knowledge base) collaboratively.

Experience with multiple perspectives

Editing of a wiki page presupposes some understanding of the previous version. People who do not wish to edit a carefully constructed page may link to a new page containing their own perspective. Even inserting links to previously created pages may help other users to comprehend multiple facets of an issue. The kind of experience offered by a wiki is in a way the opposite of, and complementary to, that offered by a discussion forum: in a wiki proper, we generally infer an opinion or attitude from written product, while in a typical discussion forum the opinions can be expressed directly but the consequences or implied action may not be clear. (But see number 6).

Learner centered

Since everything in a wiki (content and structure) is in principle co-constructed by learners and instructors together, this medium lends itself to learner-centered education.

Learner relevant

A wiki, by giving students more freedom than most other software, maximises the potential for a wholly relevant activity or project.

Social negotiation

A wiki is continually changing, and any modification incorporating an awareness of what has gone before is a kind of social negotiation. Such negotiation can be made more explicit, however, by means of some artifact external to the wiki to support it, such as face-to-face discussions in class or external technologies such as a discussion board or email. Another

possibility is to use a wiki engine that supports discussion pages or page comments, where pages can be discussed without actually editing them directly. A further alternative is to use a standard wiki page in so-called thread mode, in which participants simply append their own comments to the page.

To the above we would mention the advantages that arise from the incremental updatability and radical hypertextuality mentioned above. The former encourages frequent revisiting and editing of text, while the latter, combined with the collaborative editability, encourages casual restructuring and repurposing. These are qualities that Spiro et al. (1992) identify as necessary for facilitating advanced knowledge acquisition.

Actual and hypothetical uses

One task assigned by one of the authors (RSL) called for a group of students to contribute information related to Kumamoto Prefecture to Wikitravel (http://www.wikitravel.org), a global travel information site. Students quickly picked up the idea of linking to other pages to enhance the value of the information they had contributed, by clarifying its relationship to pages created by others. Students expressed pleasure that they had contributed information that may be useful to a global audience, and surprise the following week on discovering that their writing had already been edited by the Wikitravel community, of which they were now members.

In an EFL reading and vocabulary course for graduate environmental science students, focused on the use of items from the academic word list (Coxhead, 1998, 2000; Coxhead & Nation, 2001), participants used a wiki as initially a collection bucket for their individual corpora of text from journals in their own sub-field, and then as a tool to organize the lexical material embedded in each corpus, and finally to relate their individually composed material to that of the rest of the group. The structure of the wiki emerged from class discussions and from regular work with the wiki, and involves each student having instant access to all the lexical items with example sentences that s/he has chosen, as well as rapid access to further examples compiled by other students. It is planned to maintain the wiki over several years, so that future students can benefit from the work of earlier students, and contribute to the wiki's development. This will hopefully lead to a sense of membership in an academic community dispersed over time.

A more ambitious project underway now is the Free Composition Wikitext Project (http://www.mattbarton.net/tikiwiki/tiki-index.php?page=Free+Composition+Wiki+Text+Project), in which it is envisaged that a group of students will create a textbook for future students over the course of a semester. This project anticipates students forming a team in which each student contributes according to his/her skills.

Conclusion

We have shown that wikis in theory meet many of the desiderata of constructivist online tools and that experience to some extent supports this conclusion. What is called for now, we believe, is detailed analysis of a broad range of uses of wikis, with a view to drawing up guidelines for when and how to use them.

Biodata

Rick Lavin works in the Faculty of Environmental & Symbiotic Sciences and associated graduate school at the Prefectural University of Kumamoto, where his research focuses on alternative learning environments, particularly in ESP settings. <rlavin@pu-kumamoto.ac.jp>

Jennifer Claro teaches English at Shokei College, Kumamoto. Her research interests are constructivism, virtual learning environments, and learning theories.
<dkclaro@shokei-gakuen.ac.jp>

References

Barton, M. (2004). Embrace the Wiki Way! Retrieved July 22, 2004, from http://www.mattbarton.net/tikiwiki/tiki-read_article.php?articleId=4

Coxhead, A. (1998). *An academic word list (Occasional Publication No. 18)*. New Zealand: LALS, Victoria University of New Zealand.

Coxhead, A. (2000). A new academic word list. *TESOL Quarterly, 34*(2), 213-38.

Coxhead, A., & Nation, I. S. P. (2001). The specialised vocabulary of English for academic purposes. In J. Flowerdew, & M. Peacock (Eds.), *Research perspectives on English for academic purposes* (pp. 252-67). Cambridge, UK: Cambridge University Press.

Cunningham, D., Duffy, T. M., & Knuth, R. (1993). Textbook of the future. In C. McKnight, A. Dillon, & J. Richardson (Eds.), *Hypertext: a psychological perspective* (pp. 19-49). Chichester, UK: Ellis Horwood.

Elrufaie, E. (2004). A Wiki Paradigm to Manage Online Course Content (Doctoral dissertation, California State University).

Godwin-Jones, R. (2003). Blogs and wikis: Environments for on-line collaboration. *Language Learning & Technology, 7*(2), 12-16.

Honebein, P. C. (1996). Seven goals for the design of constructivist learning environments. In B. G. Wilson (Ed.), *Constructivist learning environments: Case studies in instructional design* (pp. 11-24). Englewood Cliffs: Educational Technology Publications.

Hung, D. W. L., & Chen, D.-T. (2001). Situated cognition, Vygotskian thought and learning from the communities of practice perspective: Implications for the design of web-based e-learning. *Educational Media International, 38*(1), 3-12.

Jonassen, D. H. (1991). Objectivism vs. constructivism. *Educational Technology Research and Development, 39*(3), 5-14.

Jonassen, D. H. (1994). Thinking technology. *Educational Technology, 34*(4), 34-37.

Kamii, C., & Ewing, J. K. (1996). Basing teaching on Piaget's constructivism. *Childhood Education, 72*(5), 260-64.

Knuth, R., & Cunningham, D. J. (1993). Tools for constructivism. In T. M. Duffy, J. Lowyck, & D. H. Jonassen (Eds.), *Designing Environments for Constructive Learning* (pp. 163-187). Berlin: Springer.

Lamb, B. (2004). Wide Open Spaces: Wikis, Ready or Not. *EDUCAUSE Review, 39*(5), 36-48.

Lavin, R. S. (2005). *Weblogs and wikis in the EFL classroom*. Paper presented at CALICO 2005, East Lansing, MI, on May 21, 2005.

Piaget, J. (1954). *The Construction of Reality in the Child*. New York: Basic Books.

Piaget, J. (2000). *The Psychology of the Child*. New York: Basic Books.

Spiro, R. J., Feltovich, P. J., Jacobson, M. J., & Coulson, R. L. (1992). Cognitive flexibility, constructivism, and hypertext: Random access instruction for advanced knowledge acquisition in ill-structured domains. In T. M. Duffy, & D. H. Jonassen (Eds.), *Constructivism and the technology of instruction: a conversation* (pp. 57-75). Hillsdale, N.J: Lawrence Erlbaum Associates, Publishers.

Vygotsky, L. S. (1978). *Mind in society: The development of higher psychological processes*. Cambridge, MA: Harvard University Press.

Young, L. D. (2003). Bridging theory and practice: developing guidelines to facilitate the design of computer-based learning environments. *Canadian Journal of Learning and Technology, 29*(3). Retrieved August 30, 2005, from http://epe.lac-bac.gc.ca/100/201/300/cdn_jrn_learning_and_tech/2003/v29n03/www.cjlt.ca/content/vol29.3/cjlt29-3_art4.html