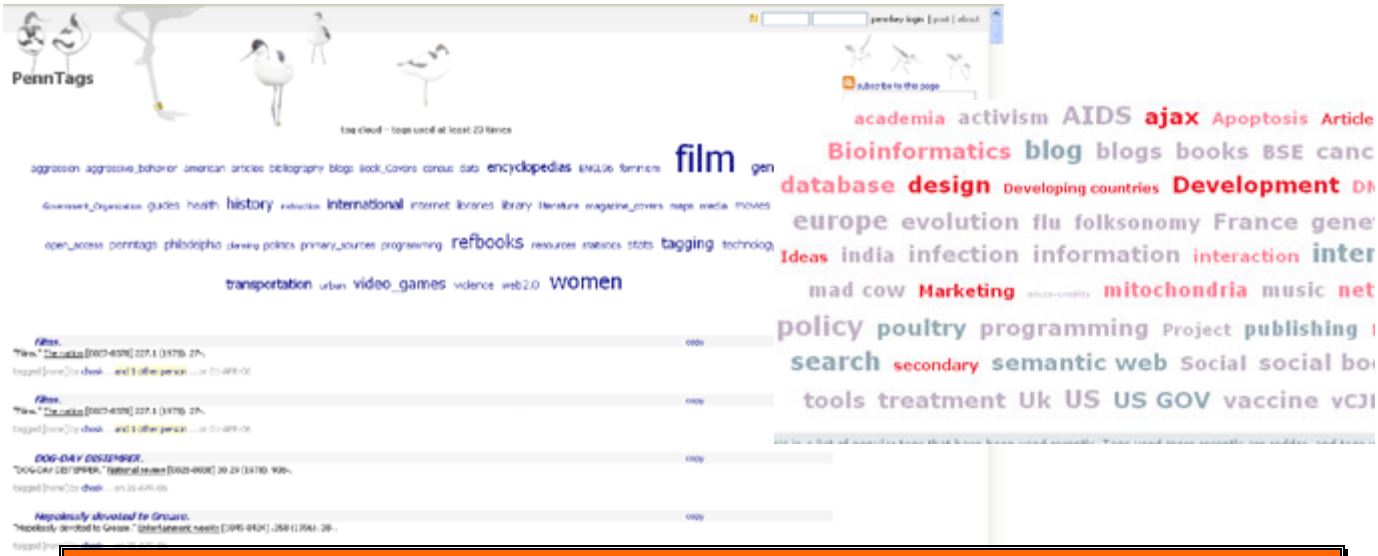

Social Tagging in K-12 Education: Folksonomies for Student Folk

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Introduction

An emerging trend in Web 2.0 (2006) is the generation of contextual meaning through social communities. "Social tagging" empowers members of social communities to name and describe objects using colloquial terms. While prevalent in online bookmarking communities, few organizations have applied social tagging to K-12 education. In this paper, I describe the recent phenomenon of social tagging. I discuss relevant literature to exemplify the current state of social tagging in education, and describe the barriers and merits to implementing social tagging networks in schools. Finally, I present my vision of the future of social tagging in K-12 education.

What is Social Tagging?

An overabundance of websites created early in the 21st century fueled ongoing efforts to categorize and organize the Web. Google, Yahoo!, AOL and others experimented with complex page ranking systems and algorithms in an effort to link information seekers to pertinent information. Finding websites became less a difficult task and more an exercise in organizing and saving them. Online communities clamored for intuitive ways to find, store, and share their "gold mine" websites with friends and colleagues—enter the social bookmarking revolution. 2003-2004 marked the release of del.icio.us, furl, simpy, and Flickr, some of the more popular online social bookmarking communities. Instead of saving websites to their browsers and photos to their computers, individuals began saving bookmarks and photos online, sharing them with others, and most importantly, labeling the items with words they could remember. This process of labeling bookmarks and photos with personalized keywords adopted the industry moniker "social tagging," and the process of creating online, community-based meaning for content was born. Today, social tagging appears in online communities as large as Yahoo! and as small as a local restaurant sharing community in southern California eatlunch.at.

Tagging and Folkonomies

Howard Rheingold muses in his *Smart Mobs* blog:

"Del.icio.us addicts like me recognize the utility of the 'social bookmarking' service as a kind of recommendation engine -- we learn, through inspection of tags over time, who tends to find the kind of sites that interest us." (2005)

Tagging is the process of assigning meaning to an object via tags. Tags are keywords or attributes that describe an object, or certain aspects of that object, from the perspective of the individual. For example, if User 1 tags the website www.apple.com with the keywords "computers, Macs, iPods," he/she probably associates the website with computer hardware and peripherals. *Social tagging* aggregates the individual's tags for an object and compares them with the community's tags for the same object to create what Thomas Vander Wal (2005) refers to as "folkonomies," or socially-constructed taxonomies within Internet communities.

To illustrate the idea of folksonomies, imagine that User 2 tags www.apple.com with keywords "education, software, laptop." The community between User 1 and User 2 begins to build a folksonomy around the www.apple.com website that conveys its socially-constructed meaning. User 3, who searches for keyword "apple" on the same site learns that the community considers the term "apple" technology-related rather than a crunchy snack. By clicking on another computer-related site, User 3 takes advantage of a key affordance mentioned often in the social tagging literature: community generated recommendations.

Social Tagging Research

The literature in social tagging is new with most articles belonging to one of two categories I call "tags-for-fun" and "tags-for-fact." The tags-for-fun articles appear in technology webzines, blogs, forums, and popular news sources. Tags-for-fun articles tend promote existing social networks, celebrate the affordances of online bookmarking, and take soft

stabs at innovative uses for tagging. On the other hand, tags-for-fact articles describe technical experiments conducted on tag datasets, tag-aggregating algorithms, and tag pattern stability and regularity. I will reference a few informative articles from each category that exemplify current thinking in social tagging.

One of the most useful tags-for-fun articles relating social tagging to the field of education was published less than a week prior to the authoring of this paper. Graeme Daniel's "Tags, Folksonomies, and Social Bookmarking" (2006) summarizes concepts and trends in social tagging and assembles a useful collection of links, online articles, bloggings, and web clippings on the subject. A majority of Daniel's references focus on how to use or modify existing bookmark technologies to teach traditional school lessons. In an article from the popular CNET news (news.com), "Tagging' gives Web a human meaning," Terdiman (2005) describes the social allure of tagging. Simply stated, people enjoy tagging pictures, articles, and websites with their own descriptive words. People can access their content more readily in the future using a personal, intuitive syntax. In "7 things you should know about social bookmarking," (Educause, 2005) the author cites the affordance of social tagging is in its ability to form dynamic communities around similar interests. Members return to social tagging communities often to gain new perspectives, effectively enhancing a site's "stickiness."

In an environment where social networking opportunities abound, technical research in social tagging is remarkably insular. Rather than probing innovative applications for social tagging technology, academic papers provide case study evidence of success and analyses of tag datasets and various tag-aggregating algorithms. A National Science Foundation-funded online journal for digital libraries, D-lib magazine, published an overview of social bookmarking tools and a related case study on Nature Publishing Group's Connotea (Hammond, Hannay, Lund, & Scott, 2005). While quick to express that social bookmarking is not the panacea for new

challenges in document classification, the authors tout the benefits of personalized content classification; an environment where structured classification is built from the ground up rather than the top down. Connotea's case study examines the pragmatics of sharing academic citations online and delivers a promising glance into the future of their open source model.

Further evidence of social tagging's affordances to library classification emerges in a recent D-lib magazine article examining tag datasets, "Folkonomies: Tidying up Tags" (Guy & Tonkin, 2006). The authors weigh the benefits of social tagging in item classification with their drawbacks and conclude that removing "low-quality, redundant or nonsense metadata" may have unconstructive effects on classification results. Additional research supports the "leave the tags alone" school of thought. Computer scientists at Hewlett Packard's Dynamics Laboratory report regularity in tags and tagging behavior in del.icio.us. They discover that tags created for a user's own benefit can actually benefit the community by contributing to the overall meaning of content (Golder, 2005). The HP research reiterates the notion that prevailing ideas win in tagging: lower quality tags do little to effect the overall precision of aggregate tags in large datasets. While preserving tag data is important, other researchers express the need for more precise classification and search through the elimination of irrelevant tags. Two Harvard University researchers constructed ranking algorithms to reduce what they considered to be "spagging" or spam-tagging (Szekely, 2005). The algorithms effectually limit misuse by reducing the prominence of tags deemed irrelevant by community ranking. Absent from tags-for-fact research, however, is the role of social tagging in education.

Social Tagging [not] in Education

Computer scientists and mathematicians have done some heavy lifting polishing algorithms and crafting programs to best reflect community meaning, but few have applied folksonomies to the K-12 classroom. Currently, social tagging in education refers to

communities of teachers and academics sharing journal citations and bookmarks through subject matter specific sites. Some popular examples are: CiteUlike.org, a journal citation sharing community; ScuttlEdu[1], a link sharing community for professors/teachers; and Connotea.org, Nature Publishing Group's website for sharing scientific journal citations. These sites loosely base their technology and functionality on the del.icio.us framework. Rather than distinguishing themselves with unique features, the sites target various education-related communities: Citeulike.org and Connotea.org tend to target[2] scientific and medical academic communities while ScuttlEdu attracts K-12+ teachers. From this small sample it is evident that few companies and organizations associate social tagging with its potential role in education.

Current applications of social tagging technology do little to challenge our notion of schooling; rather they function as extensions to the K-12+ classrooms. A key affordance of ScuttlEdu is its success in attracting K-12+ teachers to share bookmarks. While this is not a direct benefit to student learning, the possibility exists that the shared bookmarks can somehow improve teaching and in turn improve student learning. It is a bit of a stretch to imply that bookmark sharing will lead to student learning, so how can social tagging technology directly affect student learning? It is easier to first describe what social tagging *cannot* do for student learning.

Limitations of Social Tagging in Education

Social tagging is in essence a community's attempt to create meaning. What if the community is wrong? A typical elementary school student, Johnny, illustrates our point. Johnny received an assignment from his health teacher to write a story about why dentists like apples. Johnny is a recent immigrant to the United States and does not understand the term "apples" and

[1] http://blogs.zanestate.edu/mybookmarks/
[2] While these sites are open to the public, they have a tendency to attract a specific group of scientific researchers.

how it relates to dentists. If Johnny searches for the tag "apple" on a social bookmarking site, he may find content relating to computers. If Johnny searches for "apples + dentist" on the same site, he may find patient management software for the Mac. With little contextual understanding of how the apple might relate to clean teeth, Johnny accepts the community's meaning for apple and how it relates to dentist, and writes his essay on patient management systems. From the perspective of Johnny's teacher, he has missed the point of the assignment. From Johnny's perspective, his ideas reflect the ideas of his new community. Both Johnny and his teacher are correct.

Johnny's situation demonstrates another limitation of social tagging—common language. Social tagging communities by nature define the language, both formal and colloquial, that is most frequently used to describe content. When someone with a distinctly different vocabulary enters an established community, their tags and tag searches represent the *low quality tags* referenced earlier in this paper. When Johnny searches for a "perro," (Spanish for 'dog'), he is confused to see that none of the resulting photos have dogs. He sees pairs of shoes, a paring knife, and a few other objects in pairs, but no dogs. Johnny's search terms and tags fail to reflect those of the community and provide results considered by Johnny to be unrelated to his topic.

Merits of Social Tagging in Education

The misclassifications and differing vocabularies described as limitations above can also be viewed as affordances of social tagging technology. Tags reflect an individual's conception of an object. For example, Johnny tags a picture of his dog with the word "gigante." Johnny's dog is named "Gigante" so it makes sense to him that every time he wants to recall photos of his dog on Flickr, he types the word "gigante." This tag could also encourage the spontaneous construction of a new, Spanish-speaking community who recognize "gigante" as the Spanish term for "huge" and tag their big dogs similarly. Tagging is a powerful categorization tool for

Johnny because his classifications are constructed from both his language and his understanding, and not from an organizationally-designed drop down menu. Social tagging empowers students to intuitively categorize and more easily access stored content.

Another merit to social tagging is evident when a student discovers new and exciting ideas that enhance his conception of an object. Social bookmarking and photo sharing sites encourage students to connect with communities broader than their families and classmates. These communities often think about things differently based upon their contexts. For example, Johnny may learn that what he tags as "fried dough" in his Flickr photos students from Pennsylvania tag as "funnel cake." Johnny's vocabulary and understanding of the object grow through exploring related tags. The process of tagging in any social networking site is a social interaction; that is, an expression of self to community and a relation of community to self. By interacting with a broad social community Johnny not only creates new understanding of familiar content, but he develops a greater understanding of his world and how it is viewed by others.

The Future of Social Tagging in Education

Members of the emerging technology industry share both optimistic and skeptical views on the future of social tagging ("Philosophies of Folksonomies - Future"). Matt Biddulph, a former software architect at BBC radio, supports a utopian view with a mock-up of what del.icio.us tagging would look like if it were embedded in the BBC's website (2005). Biddulph demonstrates that by leveraging existing social networking sites, social tagging can assist in the horizontal navigation of content rich sites by providing navigation recommendations in real time. This form of assisted navigation is in its developmental infancy. At a talk last October in Harvard Law School's Berkman Center, Joshua Schachter, CEO and creator of del.icio.us, spoke of new del.icio.us features where users will be able to share tags in private networks and select

people to be part of their personal networks (Kanter, 2005). The idea of folksonomies within folksonomies has the potential to create a more personalized related tag set.

A less optimistic psychologist and market research analyst, Michael Wexler states in his appropriately titled blog post *I hate tags*, "'Folksonomies' are just delaying the useful organization in terms of a short sighted, fun approach." (2005) Louis Rosenfeld, co-author of *Information Architecture for the World Wide Web* and social tagging naysayer states: "But they [user tags] don't support searching and other types of browsing nearly as well as tags from controlled vocabularies applied by professionals" (2005). Dystopians dismiss user constructed social tagging as little more than a search fad; however, they fail to recognize the subtleties that make social tagging particularly suited to K-12 education.

Social tagging applications are of particular interest to K-12 schools due to their ability to quickly react and adapt to changes in colloquial language. With immediate access to content through several media, student language evolves faster than most teachers can follow. Social tagging affords students the ability to use *their* words to describe content and *their* words to search for content. When a social tagging system is limited to a group of students within a school or district, the language used in the students' everyday lives is the language used to categorize and access content. While the ability to use colloquial language to identify content is a primary affordance of social tagging, its utility has largely been applied to bookmarking websites.

Looking beyond bookmarks, I propose that tagging and sharing files *and* web pages within educational communities is a direct and intuitive way to label and access relative content. The idea of organizing and sharing files through social tagging is distinctly different from sharing bookmarks in one regard—ease of access to targeted information. Whereas a bookmark generally leads the user to a website, the website itself is not always the targeted destination.

The website may contain information pertaining to the tagged topic, but specific information may be located in several parts of the website. The amount of information relating to the tag can be so great that further keyword searching or navigation is required to access relevant information. Johnny can once again illustrate our point when he tags www.whitehouse.gov with "president, house, Bush." If Johnny's classmate Erin searches for "president" in their social tagging community, she will likely reach Johnny's www.whitehouse.gov link. Once Erin clicks the link, she will have to search the site to find information about the President. With socially tagged file sharing, clicking on the document is generally the end state. If Johnny wrote an essay on President Bush and tagged it "president, Bush, white house," Erin's search would take her directly to Johnny's essay. Rather than entering a website with its own navigation, Erin opens the document to which the "president" tag directly refers. This simplifies the search process and greatly reduces the amount of clicks required to access targeted information.

The same direct access to content that benefits students in social tagging networks can assist teachers in their professional development. School communities can efficiently share and find worksheets, lesson plans, and other teacher-related materials in school or district-wide social tagging communities. Unfortunately, social networks that promote document sharing among communities of teachers are either extremely rare or do not yet exist. To this end a colleague and I have piloted a socially tagged file sharing application for a small community of teachers at http://share.gradeweb.com. The application is based upon the open source code *Scuttle*[3], and is freely available under the Creative Commons license. We use it as intended, to share and categorize our favorite links, but we added an easy way for teachers belonging to the Gradeweb network (www.gradeweb.com) to upload files, tag them, and share them with other teachers under the auspices of professional development. We plan to conduct interviews and analyze user

[3] http://sourceforge.net/projects/scuttle

statistics to give us ideas on how to improve the project; however, it is challenging to construct experiments that determine the site's effectiveness at connecting teachers with targeted content more rapidly than the various methods teachers currently use.

A barrier we already see in our social tagging implementation is that sharing lesson plans and worksheets requires "Socialist" buy-in. Teachers must be willing to share documents they worked hard to create in order to serve the common good. In addition, teachers must accept documents from others with the expectation that the documents are credible, relevant, and able to be reproduced. The reproduction of content introduces another area of consideration: copyright law. Teachers often use materials from copyrighted curricula and other licensed sources and sharing these materials with teachers outside of their school may violate copyright law. As a result, teachers must educate and "police" themselves to ensure that their file sharing is permissible.

Conclusion

File sharing through social tagging will likely have its greatest impact on existing small learning communities. In many cases, teachers in small learning communities share ideas and materials as part of their current practice. Online file sharing with social tagging can function as an extension to current teaching practice and introduce an easy way to archive and recall pertinent information. The literature shows that tags add vitality and a personal touch to online bookmarking. While discounted by some as a temporary and somewhat less precise method of categorization and search, interest in social tagging is growing rather than waning. With the potential to change "the Web" to "my Web," social tagging technology will soon find its way into classrooms perhaps not as a stand-alone tool, but as a way to help the multi-tasking Millenial generation get organized.

References

Biddulph, M. (2005). Flash Demo on Social Tagging in BBC's archives. Retrieved March 23, 2006, from http://www.hackdiary.com/misc/firefox-delicious-demo.html

Daniels, G. (2006). wwwtools for teachers. Retrieved March 23, 2006, from http://m.fasfind.com/wwwtools/m/6350.cfm?x=0&rid=6350

Educause. (2005). 7 things you should know about...Social Tagging. Retrieved March 24, 2006, from http://www.educause.edu/ir/library/pdf/ELI7001.pdf

Golder, S. A. a. B. A. H. (2005). The structure of collaborative tagging systems. Retrieved March 27, 2006, from http://www.hpl.hp.com/research/idl/papers/tags/tags.pdf

Guy, M., & Tonkin, E. (2006). Folksonomies: Tidying up Tags? *D-Lib Magazine* Retrieved March 23, 2006, from http://www.dlib.org/dlib/january06/guy/01guy.html

Hammond, T., Hannay, T., Lund, B., & Scott, J. (2005). Social Bookmarking Tools (I): A General Review. *D-Lib Magazine* Retrieved March 23, 2006, from http://www.dlib.org/dlib/april05/hammond/04hammond.html

Kanter, B. (2005). Beth's Blog: Joshua Schachter: Future of Tagging. Retrieved March 24, 2006, from http://beth.typepad.com/beths_blog/2005/10/joshua_schachte.html

Philosophies of Folksonomies - Future. Retrieved March 23, 2006, from http://www.slais.ubc.ca/courses/libr500/05-06-wt1/www/a_ens/future.htm

Rheingold, H. (2005). Smart Mobs: Patterns in del.icio.us. Retrieved March 23, 2006, from http://smartmobs.com/archive/2005/08/15/patterns_in_del.html

Rosenfeld, L. (2005). Jan 06, 2005: Folksonomies? How about Metadata Ecologies? Retrieved March 23, 2006, from http://louisrosenfeld.com/home/bloug_archive/000330.html

Szekely, B. a. E. T. (2005). Ranking bookmarks and bistros: intelligent community and folksonomy development. Retrieved February 20, 2006, from http://torrez.us/archives/2005/07/13/tagrank.pdf

Terdiman, D. (2005). 'Tagging' gives Web a human meaning | CNET News.com. Retrieved March 24, 2006, from http://news.com.com/Tagging+gives+Web+a+human+meaning/2009-1025_3-5944502.html

Wal, T. V. (2005). Folksonomy. Retrieved March 23, 2006, from http://vanderwal.net/essays/051130/folksonomy.pdf

Wexler, M. (2005). I hate "tags". Retrieved March 20, 2006, from http://www.nettakeaway.com/tp/article/145/i-hate-tags

Wikipedia. (2006). Category:Web 2.0. Retrieved March 24, 2006, from http://en.wikipedia.org/wiki/Category:Web_2.0