

INSTRUCTIONAL USES OF SOCIAL BOOKMARKING: REFLECTIONS AND QUESTIONS

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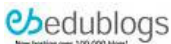
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Social bookmarking using Delicious (<http://del.icio.us>) provides a powerful tool for storing and organizing one's bookmarks of web pages and sharing those bookmarks with others. It can be a useful tool for personal use but less is known about its potential use as a tool for connecting with students. Research has noted the importance of building communities in the learning process, which suggests that the exploration of this tool as a connector would be beneficial. This article explores the use of Delicious as an instructional tool in a graduate online class. People have bookmarked web pages for years on their own computers, so it is of interest to explore what compels one to change that practice to an online storage process that is open and sharable. Data will be presented which explores the uptake by students of this practice and analyzes implications for education, including questions for further research.

Cuvinte cheie: social bookmarking, del.icio.us, education

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Prezența sa virtuală poate fi consultată în:

-  <http://www.linkedin.com/pub/4/734/981>
-  <http://del.icio.us/bwatwood>
-  <http://bwatwood.edublogs.org/>

INTRODUCTION

There has been a good deal of buzz in the past year about social bookmarking in general and the website <http://del.icio.us> in particular. Both items have appeared in national conferences (Edwards et al, 2007; Everhart et al, 2007; Murray, 2007; Nugent and Watwood, 2007). Googling “social bookmarking” raises nearly 36 million hits, with over fifteen thousand hits in the more focused Google Scholar. Muir (2005) two years ago gave ten reasons why teachers should use social bookmarking. Yet with all this buzz, few faculty are apparently using social bookmarking as a tool and until this fall semester, I was one of those unconverted. I learned this fall that social bookmarking gives you a powerful tool to interact with your students in a different way. It provides yet another connection with your students – one that can help build your learning community. Researchers have long noted the value of building community with your students, in both on campus classes and online classes (Palloff and Pratt, 2007; Tagg, 2003; Fink, 2003; Chickering and Gamson, 1987). To effectively begin using social bookmarking in classes, one has to first see the positive aspects for one’s personal use and then move that use into an instructional framework. I consider myself fairly tech savvy, yet I was not initially compelled to use social bookmarking. This article will discuss my personal journey towards using a social bookmarking website – <http://del.icio.us> (hereafter “Delicious”) – as an instructional tool in a graduate class that I teach. I have found that social tools such as Delicious can enhance teaching by providing another connection with our students - professionally and personally.

WHAT ARE SOCIAL BOOKMARKING AND DELICIOUS?

Many of us bookmark websites that we find as we surf the web. When we do so, we typically save these websites to our hard drive as either *Favorites* in Internet Explorer (Microsoft, 2004) or *Bookmarks* in Firefox or Safari (Jurdzik, 2006; Apple, 2007). While this practice is effective if one works at only one computer, it can be limiting if one wishes to use their bookmarks at multiple computers (office, classroom, home) or one wishes to share their bookmarks with others. This limitation was rectified through social bookmarking. Wikipedia (2007a) defines “social bookmarking” as:

“...a way for Internet users to store, organize, share and search bookmarks of web pages. In a social bookmarking system, users save links to web pages that they want to remember and/or share. These bookmarks are usually public, but depending on the service's features, may be saved privately, shared only with specific people or groups, shared only inside certain networks, or another combination of public and private. The allowed people can usually view these bookmarks chronologically, by category or tags, via a search engine, or even randomly.

Most social bookmark services encourage users to organize their bookmarks with informal tags instead of the traditional browser-based system of folders, although some services feature categories/folders or a combination of folders and tags. They also enable viewing bookmarks associated with a chosen tag, and include information about the number of users who have bookmarked them. Some social bookmarking services also draw inferences from the relationship of tags to create clusters of tags or bookmarks. “

Delicious is one of many social bookmarking websites. Created in 2003, the founders of Delicious describe it as “a collection of favorites – yours and everyone else’s” (Delicious, 2006a). Once one has established a free account with Delicious, one can keep links to any website and then access these links from any internet-connected computer, share their links with

others, and search other's accounts for links of interest. As a social bookmarking service, links saved to your account can be viewed by others, just as you can view the links saved by others.

In most browsers, websites can be saved using bookmarks, but only one bookmark can be used to describe a website. This can be limiting. For instance, one might want to save a recipe from a Food Network episode, and so use the bookmark "recipe". If one does this frequently, it become difficult to cull out the cake recipe from all the other recipes one has saved! However, in Delicious, one uses "tags" to describe the links one saves. Tags are one-word descriptors for websites, and a single website can have multiple tags (recipe, cake, birthday, favoritecakes, etc.) (Delicious, 2006b). In Delicious, a collection of tags (known as a tag cloud) can be organized categorically, as I have done in my tag cloud below. Tag clouds can actually give one a glimpse into the mindset of the owner, as I found in reviewing the tag clouds of my students.



screencapture tag cloud del.icio.us/bwatwood taken on Nov. 23, 2007

GETTING TO KNOW DELICIOUS?

I was first introduced to Delicious by a colleague at Virginia Commonwealth University's Center for Teaching Excellence. He had begun using Delicious to organize his bookmarks. My initial impression was that this was nice...but not necessarily useful for me. I was comfortable with my present if inefficient method of bookmarking in my browser. Yet, I had been sensitized to Delicious and I began to notice references to Delicious in blog postings and conference proceedings. For instance, one individual posted his tag cloud as part of his resume (http://ideant.typepad.com/ulises_mejias.html).

I noticed that colleagues were beginning to include their Delicious accounts in their email signatures. The tipping point for me was the realization that this was a tool for communication and connections as much as it was a tool for organizing bookmarks. At first, the social aspect was neither apparent nor intuitive. So after four months, I decided to take a second look and established my own account.

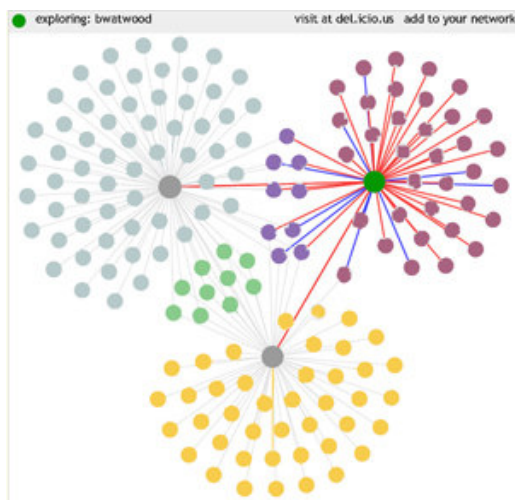
As part of my second look, I reviewed some of the literature about social bookmarking and tagging. One particularly helpful resource was the Educause Learning Initiative's "7 Things You Should Know About Social Bookmarking" (Lomas, 2005). In this two-page summary, Lomas describes social bookmarking, its significance, some challenges, and implications for teaching and learning. Lomas noted:

"Tagging information resources with keywords has the potential to change how we store and find information. It may become less important to know and remember where information was found and more important to know how to retrieve it using a framework created by and shared with peers and colleagues. Social bookmarking simplifies the distribution of reference lists, bibliographies, papers, and other resources among peers or students."

Several researchers have picked up on this theme. Abbattista et al (2007) noted that while individuals chose tags that he or she wished, the tight feedback loop of being conscious of what others had chosen led to a collaboration of tagging terms that became social in nature, what is known as Folksonomy (Wikipedia, 2007c). Under this Folksonomy approach, they noted that users build a digital library of web resources that involved conscious selection, organization, and sharing of collections, leading to a community knowledge evolution. It is a web-based form of social constructionism. As Michael Pick (2006) noted, real people are sharing their real interests. This concept of community knowledge resonated with me. As an online teacher, I believe that it is critical for one to build communities of learners within the online environment. Hacking (1999) noted that ideas do not exist in a vacuum but instead inhabit a social setting. Delicious appeared to be a tool that would enhance this communal effort. Gwizdka and Cole (2007) made the observation that while many (including me) used Google for web searches and research, Delicious offered a new web search resource that was both different from Google and filtered by like-minded individuals. Yanbe et al (2007) further noted that as tagged pages were manually checked and filtered by multiple web users, they provided improved quality to search results. In beginning to use Delicious, I began to note like-minded individuals from checking “others who have saved” the same website I had saved. Their tagclouds offered a rich source of new (to me) websites on topics of interest to me. I added these individuals to my network, and in some cases they reciprocated, leading to another means of communicating around topics of interest. This was a practice that I eventually incorporated into my online class.

Around the same time that I was introduced to Delicious, I was beginning to explore various educational social networking sites. One that I particularly liked and subsequently joined was Eduardo Peirano’s *College 2.0* site on Ning (<http://college2.ning.com/>). This social networking site was focused on higher education, online education, and Web 2.0 tools. Through this site, I met Gabriela Grosseck. She had posted a response to Peirano’s forum on using Delicious for bookmarking and networking (Peirano, 2007). She also provided a link to a paper she had written on using Delicious in education (Grosseck, 2006), which suggested several applications that I could use in my own class. Her rationale for using Delicious revolved around the personal side first:

- Building one’s own collection using both personal and Delicious- recommended tags
- Managing these saved sites through bundling or categorizing of like terms
- Personalizing saved information, thereby creating one’s own vision of the internet
- Searching the Delicious database as a source of filtered intelligence, and
- Evaluating the shared information in Delicious, which becomes increasingly personal due to self-selected tags



As rich as the personal reasons were, Grosseck provided me with the best reason to move this tool into my class - the use of this resource for collaboration and communication. In fact, Grosseck was one of the first colleagues that I added to my Delicious network (as she added me to hers).

screen capture del.icio.us network of bwatwood
taken on Nov. 27, 2007

The image above comes from a Delicious explorer developed by Milan Matull and Michael Schieben¹, showing the overlapping networks of Britt Watwood, Gabriella Grosseck, and Eduardo Pierano, as of November 2007. My network in the upper right shares several people with both Gabriella in the upper left and Eduardo below, including several of my students (who make up half of my network).

Grosseck described several ways in which Delicious could support teaching and learning, including (Grosseck, 2006):

- Use on multiple computers
- Support for lectures
- Mechanism for building learning communities
- Research resource
- Bibliographical aid (in fact, all references for this article can be accessed at http://del.icio.us/bwatwood/wbw_articleref)
- Insights into student interests and needs
- Feeds into RSS aggregators

I was then in the process of updating a graduate course I was to teach in the fall – *TEDU 560: Instructional Uses of the Internet*. Grosseck’s suggestions appeared ready-made for my course. I therefore decided to require all of my students to establish Delicious accounts and began to formulate the processes by which we would collectively use this tool during the fall semester.

DELICIOUS AND TEDU 560

Oliver (2007) observed that in “the emerging era of the “read-write” web, students can not only research and collect information from existing web resources, but also collaborate and create new information on the web in surprising ways.” Delicious has allowed this to come to fruition in my class. This past fall, I taught an online graduate course, TEDU 560: Instructional Strategies Using the Internet, with 24 K-12 teachers who were working on their Masters degree in Education. My students were scattered over a two-state area making face-to-face interactions impossible. We used a course management system for online asynchronous discussions, synchronous chats, and assignment management. The course was project-based, requiring the students to develop three web-based projects for their K-12 classes. As Oliver noted, Web 2.0 tools enabled teachers and students to harness internet resources and build projects collaboratively. I believed that Delicious would improve the ability of multiple students to quickly share resources, maximizing their focus on their web projects.

Tags in Delicious are not prescribed or standardized, they arise naturally through the collective users’ vocabularies and wishes (Delicious, 2006b; Veres, 2006). Tags are relevant keywords informally assigned by users, which can be both a strength and a weakness. For instance, the term “apple” could refer to the fruit, the computer, or Gwyneth Paltrow’s baby (Wikipedia, 2007b). However, given that like-minded people tend to use the same set of tags, the use of tags can improve the organization of multiple bookmarks. Tags are ultimately about making sense of data. Going back to the social construct of knowledge, people prescribe their personal meaning to tags as they use them. As people prescribe meaning to their organization of websites, others learn from that sense-making and follow.

Golder and Huberman (2005) identified seven types of tags:

¹ <http://www.twoantennas.com/projects/delicious-network-explorer/>

1. **Identifying What (or Who) it is About.** Overwhelmingly, tags identify the topics of bookmarked items. These items include common nouns of many levels of specificity, as well as many proper nouns, in the case of content discussing people or organizations. Examples would be microsoft, java, kawasaki, and facebook.
2. **Identifying What it Is.** Tags can identify what *kind* of thing a bookmarked item is, in addition to what it is about. Examples include article, research, blog and book.
3. **Identifying Who Owns It.** Some bookmarks are tagged according to who owns or created the bookmarked content. Given the apparent popularity of weblogs among Delicious users, identifying content ownership can be particularly important. For example, blog entries by Will Richardson could be saved using the tag richardson.
4. **Refining Categories.** Some tags do not seem to stand alone and, rather than establish categories themselves, refine or qualify existing categories. Numbers (e.g. 25, 100, 2007), can perform this function.
5. **Identifying Qualities or Characteristics.** Adjectives such as scary, funny, stupid, inspirational tag bookmarks according to the tagger's opinion of the content.
6. **Self Reference.** Tags beginning with "my," like mystuff and mycomments identify content in terms of its relation to the tagger.
7. **Task Organizing.** When collecting information related to performing a task, that information might be tagged according to that task, in order to group that information together. Examples include toread, jobsearch. Grouping task-related information can be an important part of organizing while performing a task.

For my class, I decided to use the last category of tags. I first checked by a search of the Delicious database to see if anyone was using my course identifier, "TEDU560", as a tag. I found that no one was. I therefore saved several websites of interest to my class using TEDU560 as one of the tags. At an orientation meeting for my online class, I demonstrated how to establish an account, what my account (<http://del.icio.us/bwatwood>) looked like, and how to tag websites using TEDU560. These procedures were repeated in the course syllabus, course management system handouts, and a live online chat session.

It is one thing to mandate usage, it is another to have students actually adopt a new technology. As would be expected, there were varying degrees of acceptance among my students. From my own experience, I should have known, but I quickly learned that simply pointing students to the Delicious website for enrollment procedures was not enough. I then added a link in my course management system to Lee Lefever's video, "Social Bookmarking in Plain English" (<http://www.youtube.com/watch?v=x66lV7GOcNU>), which greatly improved understanding and acceptance by the students of this tool. The students were required to use Delicious in a class assignment their second week of the course, and as part of the assignment, they were to add me to their network (and vice versa). By the third week, several students had begun to note what Yew et al (2006) stated, that the opportunity to view the tags used by others and employ those tags helped to inform their own understanding, creating an interactive learning loop. I also noted that several students had picked up the same bundling that I was using, showing the influence the teacher can have as a role model (Yew, 2006; Xu and Zhang, 2005). At the same time, there was some interesting discourse in the online discussion forum regarding the relative merits of Google versus Delicious. Some students at this early point remained skeptical, while others seemed to be enthralled.

The table below provides some snapshot data in the use of Delicious by these graduate students. It records for both the third week of the course and the twelfth week of the course:

- the total number of items tagged by individual students,
- the number of tags used,
- the number of bundle categories used
- and whether descriptive notes were added by the students to their links.

Table 1 – Delicious Data for TEDU 560 Fall 2007

Watwood					530	150	7	60%		
Student	Items 3rd Wk	Tags 3rd Wk	Bundles 3rd Wk	Notes 3rd Wk	Items 12 Wk	Tags 12 Wk	Bundles 12 Wk	Notes 12 Wk	Oct Tags	Nov Tags
Student01	28	24	6	100%	183	112	11	100%	100	43
Student02	8	7	0	100%	119	82	11	No	58	18
Student03	44	49	5	100%	104	48	6	10%	30	16
Student04	4	2	0	No	84	41	13	50%	37	18
Student05	48	50	8	No	72	74	8	5%	9	5
Student06	9	7	3	100%	70	24	7	66%	36	19
Student07	33	14	0	No	70	60	4	100%	18	8
Student08	20	30	0	No	67	15	0	No	41	1
Student09	20	7	0	60%	63	19	0	75%	18	4
Student10	18	8	3	No	62	13	3	100%	30	9
Student11	7	1	0	100%	61	19	0	60%	15	11
Student12	5	3	0	No	46	34	4	100%	24	0
Student13	2	2	0	No	45	25	11	90%	23	8
Student14	4	0	0	No	42	17	2	5%	18	12
Student15	6	8	3	80%	37	26	3	33%	28	3
Student16	15	3	2	40%	33	3	2	No	16	2
Student17	11	0	0	No	32	8	0	60%	6	0
Student18	5	2	0	No	30	16	3	60%	14	8
Student19	12	3	0	60%	20	16	1	5%	8	0
Student20	3	0	0	No	19	14	3	5%	8	0
Student21	6	10	3	20%	18	21	3	No	4	3
Student22	2	3	0	No	2	3	0	No	0	0

* All data extracted from public records at <http://del.icio.us>

I had not stated to the students that I would be tracking their use, I had simply made them aware of this tool and required its use in one assignment in the second week of a fourteen week course.

As can be seen from the data, 21 of the 22 students were continuing to tag items in October, and 17 students (77%) had tagged items in the first two weeks of November. The class averaged 14.1 tags at the third week (median of 8.5 tags), and that average had grown to 58.1 by the twelfth week (median of 53.5). With the number of students continuing to tag and the growth of their tag clouds, it appears that the majority of students did adopt Delicious as a personal tool. A review of student accounts illustrates personal use as well, with tags including “cooking”, “fun”, “home”, etc.

In examining the data, new questions emerged. Table 2 below provides additional data on tagging and network use by these students, and raises more questions than it answers. The “old” way to bookmark involved placing saved links in “folders” inside one’s browser. A bookmarked item had a one-to-one relationship with one folder. However, in Delicious, a single bookmarked item can have multiple tags associated with it (and the number of tags for the same item can vary user to user based on how each user makes meaning with tags).

Table 2 – Tagging and Networking Data for TEDU 560 Fall 2007

Student	Items 12 Wk	Tags 12 Wk	Item to Tag Ratio	Number in Network	Classmates in Network	Classmates Mutually Networked
Student01	183	112	1.63	13	11	73%
Student02	119	82	1.45	8	6	100%
Student03	104	48	2.17	21	10	80%
Student04	84	41	2.05	21	18	33%
Student05	72	74	0.97	14	12	92%
Student06	70	24	2.92	1	0	N/A
Student07	70	60	1.67	5	4	50%
Student08	67	15	4.47	7	6	100%
Student09	63	19	3.32	17	9	78%
Student10	62	13	4.77	9	6	100%
Student11	61	19	3.21	5	4	100%
Student12	46	34	1.35	6	3	67%
Student13	45	25	1.80	3	2	0%
Student14	42	17	2.47	4	3	100%
Student15	37	26	1.42	1	0	N/A
Student16	33	3	11.0	10	9	89%
Student17	32	8	4.00	13	12	58%
Student18	30	16	1.88	23	14	29%
Student19	20	16	1.25	2	1	100%
Student20	19	14	1.36	1	0	N/A
Student21	18	21	0.86	3	1	0%
Student22	2	3	0.66	3	0	N/A

*All data extracted from public records at <http://del.icio.us>

I found the item to tag ratio an interesting number, in that it demonstrated varied use of Delicious by my students. Some used few tags and therefore had high item to tag ratios (Students 16, 10 and 8). Others actually had more tags than items (Students 5, 21, and 22). This alone does not indicate adoption of multiple tags by students but raises some interesting questions about the level of adoption by students. It would be interesting to conduct additional follow-up research on levels of adoption based on changed practice.

Likewise, the network data in Table 2 raises interesting questions. My primary reason for using Delicious was to add a communication and connection tool for students. Yet, I was the only one who had all students in my Delicious network. Four students did not network with any classmates, and none networked with all students. Most had around 5 students in their network, which suggested focused networking with friends. The five students with most items tagged also had the largest networks, averaging 15 individuals (of which 11 were classmates). However, two students who did substantially less tagging – students 17 and 18 – had comparable robust networks. This would again be an area for future study and it suggests that I need to emphasize this rationale for use to future classes.

The data in Tables 1 and 2 are inconclusive in definitively showing full adoption of all features of Delicious by my students, but it does suggest that my students came at Delicious in a variety of styles and uses. Grosseck (2006) noted Canadas' four styles of tagging:

1. **The selfish style.** Tags have personal meaning (only for one's own benefit), are irrelevant to other users and difficult to place in the social context of the del.icio.us network of users. I saw very little of this being used by this class.
2. **The friendly type.** Tags are used for friends, colleagues, project partners, etc. This style is typical both for large groups and for small ones. The social benefit is great and the motivation lies in belonging to a group, in the desire to share with others what you know, to contribute to online content. The students' use of TEDU560 is an example here, as well as project terms such as webquest, cyberhunt, etc.
3. **The altruist type.** Tags are as general as possible and as many as one can use for a resource. Key words are used to describe as objectively and realistically the resource that one posts, so that it is of interest to the great majority of users of the most popular social bookmarking service. The social benefit is huge because it involves generosity. Recovering information is easy because we understand the notes attached to the post and we are able to interpret the tags. Motivation is low because it can involve a lot of work with little benefit. Yet I did see this occurring in the class for sites of use in K-12 teaching.
4. **The popular style.** Popular tagging is used in order to get more views. There is absolutely no social benefit. Such tagging is considered spam. Again, I saw little of this in my class.

After twelve weeks, the tag *TEDU560* had 371 links saved. I had placed 43 of those links in Delicious, so my 22 students had linked an average of around 15 sites each into Delicious using this class tag. What was fascinating was to look at the related links (or other tags) that my students used with TEDU560:

- assessment
- blogs
- clipart
- collaboration
- community
- constructivism
- copyright
- culture
- cyberhunt
- ecuador
- education
- esl
- fairuse
- free
- funny
- games
- geek
- geography
- hosting
- howto
- internet
- jamica
- language
- learning
- lessonplans
- math
- music
- nets
- online
- pbl
- personality
- presentation
- projectbasedlearning
- reference
- research
- resources
- rubrics
- school
- science
- spanish
- standards
- startpage
- tagging
- technology
- teaching
- tools
- tutorials
- upload
- venezuela
- video
- web2.0
- webquests
- wiki

This use of related links is the clearest evidence of multiple tagging by students. The variety suggests that the full range of tag types noted by Golder and Huberman (2005) were naturally occurring. Some of the terms relate to projects developed later in the course, demonstrating to me the adoption of Delicious as a personal tool by my students.

I kept up with the tagging flow by my students by incorporating an RSS feed from Delicious into my RSS aggregator. RSS – or Real Simple Syndication – refers to a family of web feed processes used to collect frequently updated material from the web (Wikipedia, 2007d). Rather than spend time regularly checking different websites for updates, RSS readers create a personalized “newspaper” of all updates from a variety of sites – blogs, news headlines, podcasts, even student work in Delicious – all pulled in to one site. In my case, I used Google Reader (<http://www.google.com/reader/>), though any aggregator would work. By simply subscribing to <http://del.icio.us/rss/network/bwatwood> – I could on a daily basis watch as my class tagged items. Not unexpectedly, this became a rich source of supplemental information that enhanced my own teaching.

OTHER SOCIAL BOOKMARKING OPTIONS

I do not want to give the impression that Delicious is the only social bookmarking option available to teachers. Fryer (2007) noted that other options included:

- Furl.net (<http://furl.net/>)
- Backflip (http://www.backflip.com/company/whatis_index.ihtml)
- Diigo - social website annotation (<http://www.diigo.com/>)
- ikeepbookmarks.com (<http://ww2.ikeepbookmarks.com/Default.asp>)
- carmun.com (will format references - <http://carmun.com/benefit.php>)
- Zotero (<http://www.zotero.org/>)

The Blackboard course management system recently added *Scholar* (Blackboard, 2006), which gives similar functionality of social bookmarking within a class. I had the option of using Scholar but decided to use Delicious instead for two reasons. First, I was now familiar with Delicious (why change once again?). Second, Delicious passed their two-millionth user in March 2007 and continued to grow (Delicious, 2007). To me, this ensured a robust database of links much larger than the fledgling Blackboard Scholar database.

IMPLICATIONS FOR FUTURE CLASSES

Will Richardson (2007) recently blogged about a speech Mark Pesce made, quoting Pesce to say:

“The world has changed. The world is changing. The world will change a whole lot more. We lucky few...bear witness to the most comprehensive transformation in human communication since the advent of language. We are embedded in the midst of this transition; we make it happen with every script we write and every page we publish and every blog we post and every video we upload. (Pesce – quoted by Richardson, 2007)”

Richardson entitled his blog post “The ‘So Unexpected’ Present.” My experience with Delicious could have been entitled the same. It was fascinating to me to become aware of a tool last summer, begin to find relevance to my own craft and practice, introduce it to my class this fall, and observe measurable change in their practice. As I have noted, as many questions have been raised as issues noted. I plan to continue using Delicious as a tool with my class, but I will

revise my introduction and instructions to give added emphasis to the collaborative and sharing aspects of Delicious. I believe that the data collected above showed Delicious is readily adopted for personal use in organizing bookmarks, but the data suggests that the social uptake lagged behind this personal use. My students were older students, not the NetGen students now entering universities. We as faculty will increasingly face a student body that routinely use Web 2.0 tools in their personal life. This exercise provided me with an opportunity to embed one of those tools – Delicious - within my learning environment. In doing so, I opened up exchange at both the course level and at the personal level. I believe my course was stronger due to its use. More research will be needed to understand the long term implications.

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