



Wikis in Higher Education

An exploratory report about the value of wikis in higher education, from a faculty perspective.

IT-User Services, University of Delaware

University of Delaware staff should contact the PRESENT for any question or comment: <http://www.udel.edu/present>

Full report and examples published at <http://udel.edu/~mathieu/wiki>

Version 1.2. May 23, 2008



Table of Content

- I. About IT-User Services at University of Delaware..... 3
- II. Purpose of this report 3
- III. Methodology..... 3
- 1. What Is A Wiki Anyway? 4
 - 1.1 The Original Wiki Definition 4
 - 1.2 A Looser Definition of Wiki..... 6
 - 1.3 Typical Usage of Wikis (What Wikis Are Good For)..... 7
 - 1.4 What are the major differences between wikis and other tools? 8
- 2. Wikis in Education 9
 - 2.1 Examples and Advices from the Literature and the Web..... 9
 - 2.2 Wiki Pioneers at University of Delaware 13
- 3. Lessons Learned in Defining Wiki Usage in a Course 14
 - 3.1 Instructional Strategy 14
 - 3.2 Control and Ownership Issues..... 15
 - 3.3 Individual, Team, and Class Contribution 16
 - 3.4 Templates 17
 - 3.5 Understanding the Markup Language..... 17
 - 3.6 Wiki Charter and Etiquette..... 18
 - 3.7 Using the Wiki Beyond the Wiki 18
 - 3.8 Grading Strategy..... 19
- 4. Conclusion 20
- Bibliography..... 21
- Annex A: Most Common Markup Notation in the Sakai Wiki Tool 23
- Annex B: Wiki Charter25

I. About IT-User Services at University of Delaware

With over 20,000 on-campus students and over 4,000 staff and faculty members, University of Delaware is a considerable community. IT-User Services' staff is the main service provider that supports the use of technology for administrative, research, teaching and learning needs of the community. Over the years, a growing number of technologies have been implemented and supported by IT staff and by individual departments and colleges. Some of these technologies are answers to the same basic need, while some are definitely innovative and unique.

Instructional Services, a sub-unit that focuses on improving teaching and learning with technology, has the responsibility of evaluating and recommending tools and techniques proven to be the most efficient to help faculty members to generate deeper learning for students.

II. Purpose of this report

After eight years of being a WebCT university, the learning management system is now a mission critical software. The adoption of Sakai, a community-source LMS, opens new possibilities in term of teaching and learning innovation.¹ In order to promote deeper student learning and leverage technology for teaching and learning, it is now more than ever time to start rolling out read/write web technologies (also called web 2.0).

Wikis have been in general use for some time, but they are still an emerging training technology. This report will try to demystify what a wiki is, how it can be used, and what practices using wikis are worth replicating.

III. Methodology

This report provides a broad literature review of books, blogs, wikis, articles, and a collection of faculty practices (through individual interviews). It seeks to give a summary of some general knowledge as well as some of the author's personal insight.

¹ University of Delaware will be using Sakai 2.5.0 in full production starting in September 2008. For more details regarding UD's implementation, visit <http://www.udel.edu/udlms/>. You can also visit <http://www.sakaiproject.org> to know more about the Sakai CLE, community and Foundation.

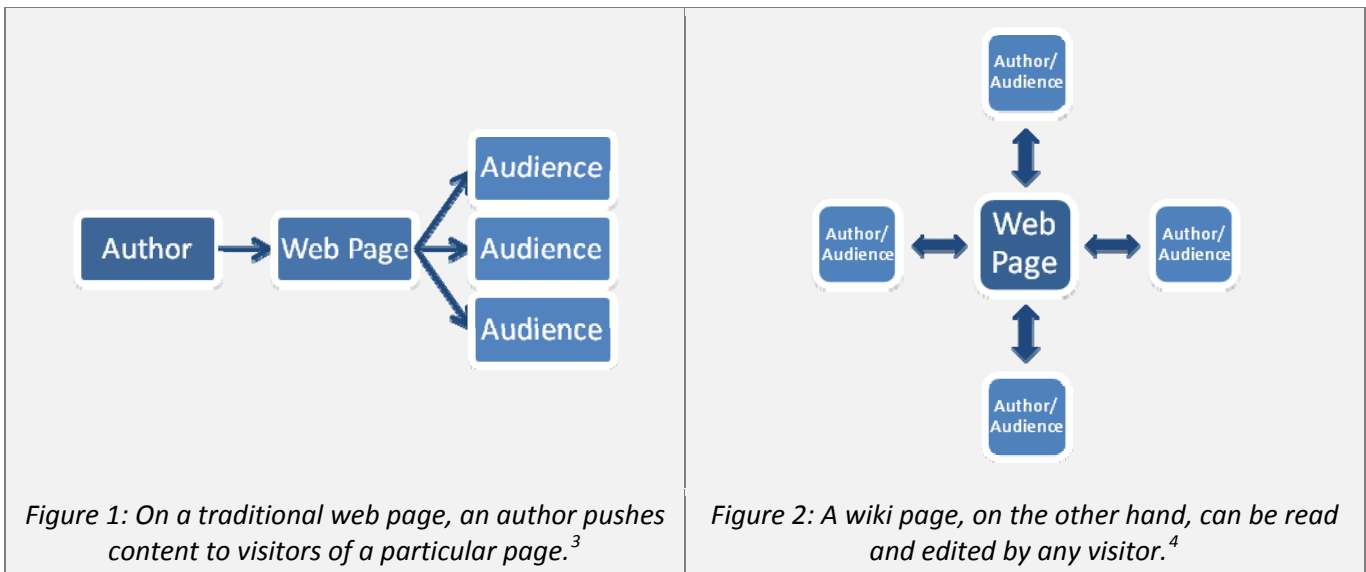
1. What Is A Wiki Anyway?

I chose wiki-wiki as an alliterative substitute for quick and thereby avoided naming this stuff quick-web.

Ward Cunningham, inventor of the wiki²

At its simplest expression, a wiki is a web page that anybody can edit. The spirit behind the original wiki idea is that any user of the World Wide Web could now read and write at the same time using their web browser, therefore simplifying the web editing process.

Figure 1 represents a traditional web page editing and publishing process, where the author pushes content to a passive crowd of internet users. Figure 2, on the other hand, illustrates what a wiki web page is: a page that is readable and editable by every user.



1.1 The Original Wiki Definition

Like any respectable open-source technology, the community of pioneer users has set some ground rules of what can truly be called a wiki:

- *No authorship allowed:* A wiki is owned by its community, meaning that anybody who posts something on a wiki must let it go, even if it means that the next user will erase or rephrase everything that has been posted. It is a democratic tool which enables collaboration.⁵
- *Simplified markup language:* Wiki markup language is easier and more automated than HTML. URLs are linked automatically. Creating an internal link creates a new page without further programming.⁶ In other words, “Wiki language is the most naked embodiment of the HyperLink concept.”⁷

² Cunningham, Ward (1995), *Wiki History*, [Online], retrieved 11/9/2007. <http://c2.com/cgi/wiki?WikiHistory>

³ Grenier, Brian (2007), *Wikis in the Classroom*, El Paso Independant School District, [Online], visited 26/10/2007. <http://www.slideshare.net/briangrenier/wikis-in-the-classroom-34105>

⁴ Ibid.

⁵ Barton, Matt (2004), *Embrace the Wiki Way!*, Personal Blog, [Online], retrieved 10/25/2007.

- *Focus is on content, not on format:* Most wikis look like very plain HTML pages. The quality of a wiki is in its content, not in the way it looks.⁸
- *Version tracking:* The history of every single tiny change of every wiki page is available to anybody, which means that a page can travel back in time to a previous state at any moment.
- *The structure is defined by the community:* There is no need to create a wiki architecture from the get-go or to have a group leader who imposes a way of organizing content. Wiki rules will emerge from consensus when needed.
- *The community is the watchdog:* If the community is engaged in the wiki and because of the version tracking feature, getting rid of erroneous entries and graffiti (made consciously by vandals) is fast and efficient.⁹ Therefore, there is no need for any kind of security procedure or for a user registration process.

A lot of wikis are currently working very efficiently by following these “anarchic guidelines”. But as usage began to explode, a lot of people saw a huge potential for other usages, particularly in the corporate world, where accountability, copyright respect, and privacy are all required.

⁶ Lamb, Bryan (2004), *Wide Open Spaces: Wikis, Ready or Not*, EDUCAUSE Review, vol. 39, no. 5 (September/October 2004). Page 38.

⁷ Various authors (2007), *Why Wiki Works*, [Online], retrieved 10/25/2007. <http://c2.com/cgi/wiki?WhyWikiWorks>

⁸ Turnbull, Giles (2004), *Talking to Ward Cunningham about Wiki*, luvly, April 6, 2004. <http://gorjuss.com/luvly/20040406-wardcunningham.html>.

⁹ Shirky, Clay (2003), *Wikis, Graffiti, and Process*, Many-To-Many: Social Software, August 26, 2003. <http://many.corante.com/20030801.shtml>

1.2 A Looser Definition of Wiki

“Although wiki purists scoff at the idea, there are a number of web-based wiki sites that feature a password and login system similar to weblogs for people to interact with the site.”

Will Richardson, educator¹⁰

Beyond the strict definition described in the previous sub-section, there is a whole universe of possibilities on how to use wikis. Not everyone will agree that these hybrid wikis are true wikis. Figure 3 shows the multiple features that can make a wiki a better fit for specific contexts.

Pure Wiki	↔	Hybrid Wiki
Anonymous	↔	Users and changes are tracked
Content is public domain	↔	Content is copyrighted or private
Textual content only	↔	Embedded images/videos/applications
Unstructured	↔	Template-driven/Workflow-driven
Consensus of its community	↔	Moderated by experts
Open access	↔	Limited access
Anyone can read and edit any page	↔	Permissions for users and pages
Collective workspaces	↔	Private workspaces
Standalone application	↔	Integration with other systems
Never finished	↔	Deadline-driven
Content is “as is”	↔	Content is edited or peer-reviewed

Figure 3: The wiki features continuum¹¹

Depending on a community or organization needs, a community leader will choose the features that will represent the best possible fit. There is always room to compromise between these extremes. Some features might not be available for every wiki system though, so one must be careful in selecting a specific wiki tool.

¹⁰ Richardson, Will (2006), *Blogs, wikis, podcasts, and other powerful web tools for classrooms*, Corwin Press, Thousand Oaks CA. Page 65.

¹¹ Inspired from Lamb, Bryan (2004).

1.3 Typical Usage of Wikis (What Wikis Are Good For)

Wikis are used to support a large number of different activities. Here are some of the most common ways wikis are used.

- *Brainstorming:* When starting a specific project or a creative process, participants are invited to add items and thoughts on a wiki. They are also asked to link all these random thoughts and concepts together in order to stimulate creativity.
- *Group project:* A wiki can act as a private intranet for a specific group project so all participants can communicate, share resources (including texts, videos, spreadsheets, links, etc.), and write a report or a book together.
- *Meeting support:* An agenda for a specific meeting is posted on a wiki and participants are invited to consult and edit it prior to a meeting. The wiki is edited during the meeting to include what was discussed. Participants can later use the wiki to post missing information or follow-up items. This technique is also very useful for training, presentations, and birds of a feather sessions during conferences.
- *Make lists:* From a list of best restaurants in town to a glossary of terms used in a specific field of expertise, a wiki is a great way to organize this kind of content. In the same spirit, wikis can also be used to build an online repository of relevant documents or FAQs.
- *Collections of links:* Wikis can be used for social bookmarking. They give to all participants the possibility to post, comment, group, and classify links of all nature or in a specific field of expertise.
- *Writing a collective letter, position, statement, web content:* When writing something that is intended for an official legal instance, to clients, to upper management or to the general public, a wiki is an excellent tool to reach a consensus, define key ideas, and write down the content to be clear and non-offensive.
- *Building a group portfolio:* Any organization can use a wiki to post past projects, testimonials from clients, history of the organization, etc. This kind of portfolio is a powerful marketing tool.

1.4 What are the major differences between wikis and other tools?

While there are a number of similarities between wikis and other web tools, there are also some significant differences. Table 1 presents the similarities, the differences, and the most common usages of blogs, discussion boards, instant messaging, content management systems, and knowledge repositories in comparison with wikis.

Table 1: Similarities and differences between wikis and other web tools

Tool	Similarities With Wikis	Differences With Wikis	User Actions in Tool
Wiki			<ul style="list-style-type: none"> • Member of community posts information • Other members edit current information • Other members add links to resources and new wiki pages
Blog	<ul style="list-style-type: none"> • Community-driven • Needs loyal audience and motivation to reach goal • Asynchronous communication 	<ul style="list-style-type: none"> • Strong authorship (depends on reputation and notoriety of author) • Chronological • No versioning 	<ul style="list-style-type: none"> • Author posts a message • Visitors post comments on messages
Discussion board	<ul style="list-style-type: none"> • Community-driven • Asynchronous communication 	<ul style="list-style-type: none"> • Mostly chronological • Cannot edit already posted content • Usually moderated • Usually restricted to registered users 	<ul style="list-style-type: none"> • Member posts a message • Members build argumentation over previous message in thread until consensus • Member starts a new thread
Instant messaging	<ul style="list-style-type: none"> • Messy by nature 	<ul style="list-style-type: none"> • Synchronous communication • Short-lived (usually not archived) • Based on network of individual • Focus on limited number of questions 	<ul style="list-style-type: none"> • An individual needs a quick answer from another individual within his/her personal contacts
Content management system	<ul style="list-style-type: none"> • Web page editing using browser • Limited markup language usage • Content-oriented • Asynchronous communication • Versioning available 	<ul style="list-style-type: none"> • Content is controlled by organization • Uses HTML to program • Workflow-driven 	<ul style="list-style-type: none"> • Member posts a new page or edits an existing page • Webmaster approves, edits or rejects post
Knowledge repository	<ul style="list-style-type: none"> • Community-driven • Content-oriented • Asynchronous communication • Versioning available 	<ul style="list-style-type: none"> • Somewhat imposed structure • Content and context are usually separated (metadata and file) • Very restricted access • Workflow-driven 	<ul style="list-style-type: none"> • Member searches for specific file • Member posts a new file in the appropriate folder • Member updates an existing file

The purpose of table 1 is to show that wikis are a very flexible tool, but other tools might be more appropriate to achieve specific goals. Wikis usually work better for projects where individual authorship is not important. Also, wikis are appropriate for content that does not need to be protected (for instance, if you build a wiki on a hot topic like illegal immigration in the U.S., expect a lot of maintenance).¹²

Now that we know what a wiki is and is not, next section will focus on wikis in education.

¹² Barton, Matt (2004).

2. Wikis in Education

Even though wikis have been around for a while and have a lot of early adopters in higher education, it seems they have not been used to their full potential for learning. One of the reasons that has been evoked in several articles is the fact that wikis are usually associated with the concept of actual work, and not learning, which is associated with the more formal and traditional classroom training.¹³ There might be a bit of truth in that statement, but it doesn't mean that wikis are not useful in education. This section will present some concrete hands-on examples that demonstrate the exact opposite.

2.1 Examples and Advices from the Literature and the Web

This section will emphasize the way wikis are used to generate value in education. It will start with very high level use of wikis for open knowledge sharing and finish with hands-on examples.

Wikipedia

Wikipedia is one of the greatest popular successes of the internet age. As of mid-December of 2007, more than 2.1 million articles are available in English. All these articles have been written by the Wikipedia community, which is composed of web users like you and me. There is a raging debate going on regarding the value of Wikipedia for education, and this debate revolves around authorship and peer-review, two building blocks of our education system.

A lot of educators categorically refuse any citation coming from Wikipedia, warning students to stay as far away as possible from that source, including numerous K12 institutions and Lehigh University.¹⁴ Others see in that site a starting point to introduce the concept of the value of information, and set their student to check the facts on other sources (they use Wikipedia as a hub to start projects).¹⁵

Other initiatives are trying to bring peer-review and authorship back into online knowledge initiatives. Google announced a new project called *Knol* that will emphasize the value of having identified authors for each article, a process that would bring back the idea of reputation in online encyclopedias.¹⁶

Only time will tell if Wikipedia will preserve a respectable reputation as a knowledge source, but one thing is for sure: it has been a very successful venture so far. Wikipedia gave wikis a boost of publicity that makes them a widespread tool that is changing the way people communicate online.

¹³ Edmonds, Rob (2006, October). *Up from the grassroots*. E.learning Age,14-16. Retrieved October 26, 2007, from ABI/INFORM Global database. (Document ID: 1151038921). &

Eric Lesser, *Closing the Generation Divide: Shifting Workforce Demographics and the Learning Function*, IBM Institute for Business Value, [Online], retrieved 29/10/2007. <http://www-935.ibm.com/services/us/index.wss/ibvstudy/gbs/a1025581?cntxt=a1005263>

¹⁴ Olanoff, Lynn (2007). *School officials unite in banning Wikipedia*, The Seattle Times, November 21, 2007. Retrieved online on 12-20-2007. http://seattletimes.nwsourc.com/html/living/2004025648_wikipedia21.html

¹⁵ Shareski, D., & Winkler, C. A. K. (2006). *Are wikis worth the time?* Learning and Leading with Technology, 33(4), 6.

¹⁶ Regan, Keith (2007), *Google's Knol Initiative - the Unwiki?*, TechNewsWorld, December 14, 2007. Retrieved online on 12-20-2007. <http://www.technewsworld.com/rsstory/60789.html?welcome=1198189346>

Open Textbooks

Annual U.S. spending on textbooks in education is more than 4 billion dollars.¹⁷ A lot of interest groups believe that this enormous amount of money could be used in a more productive way, including **Curriki.org**, a Sun Microsystems initiative to gather K12 knowledge in an open format.

Here are some other initiatives involving wiki textbook development:

- **Wikibooks:** a child website of Wikipedia, Wikibooks already has an impressive collection of books written by volunteers about a lot of topics. They use the same wiki mindset as Wikipedia, which makes them as vulnerable to critics as Wikipedia.
- **The California Open Source Textbook Project:** In order to decrease the cost of textbooks (\$400M annually in the state of California) and avoid textbook shortage, the COSTP is partnering with Wikibooks to create free open source public domain K12 textbooks. <http://www.opensourcetext.org/>
- **The Free High School Science Texts:** South African initiative hosted on Wikibooks, all textbooks and resources are available in a wiki format online. <http://www.fhsst.org/>
- **The Global Text Project:** Initiated by two U.S. professors, the GTP has already helped universities in developing countries have access to higher education textbooks for free in the fields of MIS and business.¹⁸ <http://globaltext.org/>

E-Portfolios

E-portfolios are assigned websites where individuals post and reflect on their work. Even if some authors disagree about the value of using wikis for e-portfolios, it has been used for that purpose before and will probably be again in the future.¹⁹ A wiki has the advantage of being organized by content, in opposition with a blog, which is organized chronologically (but both technologies can be used effectively as portfolios, depending on the importance of time sequencing).

The idea behind e-portfolios is to give access to a simple enough web publishing system so that any student can easily post their work online. In that sense, wikis are ideal. Since portfolios are usually individual, there has to be some kind of security measure to make sure no intruder will start changing someone else's portfolio. Instructors and external auditors can access any e-portfolio to assess a student progress, and a student can use his e-portfolio to self-assess his learning.

Another interesting use of e-portfolios is as an institutional portfolio. Every unit of department could have a collective wiki space where they would post their accomplishments. This is particularly useful for accreditation purposes.

¹⁷ Shannon, Victoria (2007). A group approach to teaching teachers, *International Herald Tribune*, November 25, 2007. Retrieved online on 12-21-2007. http://www.iht.com/articles/2007/11/25/technology/curriki26.php#end_main

¹⁸ Foster, Andrea (2007). *Software Group Gets Online Textbooks to the Developing World*, *The Chronicle of Higher Education*, November 16, 2007. Pages A28-A29.

¹⁹ Barton, Matt (2004).

A Wiki as a Living Course Website

Heather James described an experiment she did with her students in a web design course. She created a wiki page for each in-class session, posted lecture material before the class meeting, did a quick review of last week's wiki page, gave a 10 minute lecture, and conducted in-class activities asking students to post their thoughts on the wiki.²⁰

Following this pattern, a professor must post an outline of what has to be covered and lets students fill in the blanks with what they think is important, constructing a collective study guide or textbook. Heather James warns faculty members that showing too much structure beforehand might kill creativity from the beginning, so it is important to find the right balance between a white page and a fully directed wiki space.

The Theatre Arts Wiki

Geoff Proehl is Professor of Theatre Arts in the Theatre Arts Department at University of Puget Sound, Tacoma, Washington. In a short video, he showcased the use of a wiki to support the production of a play, from the interpretation of the original text to the costumes, stage settings, and actor's movements.²¹ The use of hand-drawn sketches has been very helpful to stimulate creativity from his group.

Look at his video at the following URL: <http://itech.ups.edu/showcase/geoff-proehl-oberon>

²⁰ James, Heather (2004). *Aiming for communal constructivism in a wiki environment*, Kairosnews.org, May 27, 2004. Retrieved online on 12/21/2007. <http://www.kairosnews.org/node/3809>

²¹ Proehl, Goeff (2008). *Geoff Proehl on the Theatre Arts Wiki*, University of Puget Sound, posted on April 30, 2008. Retrieved online on 5/1/2008. <http://itech.ups.edu/showcase/geoff-proehl-oberon>

The STOLEN Principle

Dave Foord created an acronym to describe a process to follow in order to get better results when using a wiki. He called his process the STOLEN principle.²²

Table 2: The STOLEN Principle for Using Wikis Educationally

S	Specific Overall Objective	<ul style="list-style-type: none"> • Clear objective for the wiki • Understood by all • Not a “general” area • <i>Grading strategy, rubrics*</i>
T	Timely	<ul style="list-style-type: none"> • Definitive times for different “stages” of use • Definite end point - even if left open after
O	Ownership	<ul style="list-style-type: none"> • People need to feel that they “collaboratively own” the wiki
L	Localized objective	<ul style="list-style-type: none"> • Some structure of what is expected • Starting points for editing
E	Engagement rules	<ul style="list-style-type: none"> • Who can edit • Which parts they can edit • Acceptable and unacceptable use
N	Navigation	<ul style="list-style-type: none"> • Clear navigation structure • Simple navigation

* This item has been added by the author.

A detailed description of each rubric is available online at the following URL:

<http://www.a6training.co.uk/resources/STOLENticksheet.doc>

Wikipatterns

Stewart Mader published a book in 2008 called *Wikipatterns: a practical guide to improving productivity and collaboration in your organization*.²³ Even though this book is addressed to wiki users in general, its content is highly relevant to using wikis in education. The companion website of his book is also a wiki, and contributors from around the world are making this resource more and more complete: <http://www.wikipatterns.com/>.

He identified four categories of patterns (observable behaviors, attitudes, processes or actions) that strengthen or diminish the use and the usefulness of wikis: **people patterns** and **anti-patterns**, and **adoption patterns** and **anti-patterns**. It is important, before making the decision to use a wiki, to understand these patterns in order to design learning activities that make sense and leverage the power of your learning community.

²² Foord, Dave (2007). *The STOLEN principle Tick List*, A6 Training and Consultancy. Retrieved online on 12/21/2007. http://www.a6training.co.uk/resources_Social_Software.php

²³ Mader, Stewart (2008). *Wikipatterns: a practical guide to improving productivity and collaboration in your organization*, Wiley, Indianapolis. ISBN: 978-0-470-22362-8.

2.2 Wiki Pioneers at University of Delaware

Since there are already at least a dozen of faculty members from all colleges who are using wikis, it was important for this report to get their input on the use of this web tool for teaching and learning. Table 3 presents a list of interviewed faculty members for this report.

Table 3: List of interviewees for the purpose of this report.

Name	Summary
Ralph Begleiter, Communication	During the fall 2007 semester, Professor Begleiter proposed that his honor students to use a wiki for a class project. Although the idea seemed nice, he struggled with the individual grading of his students, finding the process time-consuming. He also noticed that students did not write collaboratively, but mostly wrote own their thing using a word processor and copy-pasted the finished product in the wiki. Even though he had a mitigated experience with a wiki, he thinks that it is important that the students understand what a wiki is and how it relates to how most people work out of the academia: in groups.
Richard Gordon, Computer & Information Sciences	Richard Gordon used a wiki for the first time in his class during the fall semester of 2007. Making students realize what a wiki is (a pool of collective knowledge), and how different it is from academic, peer-reviewed knowledge, was a part of his Computers, Ethics, and Society course. The first thing he asked his students to do was to start playing with the wiki in an unsigned area where they were asked to rate movies and pizzerias from the area. He was impressed by the creativity that his students demonstrated using the tool. He made students build an online glossary of terms used in his course, and students have built, on their own, a sort of handbook.
Meghan McInnis-Dominguez, Foreign Language & Literatures	During the fall 2007 semester, Professor McInnis-Dominguez used a wiki to support in-class presentation in a foreign language. The wiki provided a space for teammates to prepare their presentation material and a comment gathering point for commenting on other students work. She noticed that the presentations are better now that students are using a wiki. She provided a template wiki page to each team to guide them in their research and presentation. Students in her class developed their own fully contextualized textbook in the wiki.
Chris Penna, English	Since 2006, Professor Penna used wikis in three different courses (Composition, Survey Literature and Business Writing). In addition to face to face, two of these courses were also offered online to distance learners. The wiki provided a space for teammates to write their project collaboratively. He noticed that the use of a wiki gets students to be more self-aware of the writing processes (vision and revision). Students in his classes developed their own handbook in the wiki, which is open to public eyes, but reserved to his students to edit it. His students are proud of the fact that what they wrote in the wiki pops up on Google.
Lou Rossi, Mathematical Sciences	Professor Rossi is now considered a veteran of wiki usage at University of Delaware. He used wikis in his Calculus undergraduate course and his Applied Mathematics graduate course. Using a wiki helps students spend time on solving problems outside of the classroom in a motivating collaborative environment. Publishing in a wiki gets students aware of the fact that they are writing for an audience, which usually results in using common mathematical language and formulas instead of plain English. He describes his class as a tribe, where skillful individuals are leaders and slackers are easily detected. He warns faculty members of the pitfalls of trying to grade students on a wiki.
Carl Schmidt, Animal and Food Sciences	Professor Carl Schmidt teaches a course called Bioinformatics, which is a cross-disciplinary course on using computer applications in life sciences. The use of wikis is very important for his students because they will have to work in distributed teams throughout their professional life, especially in genome research. Every assignment was made public. The only things that remained private were grades and feedback from the professor. He found the wiki to be a very easy to use environment to monitor students, answer questions, and provide feedback. He is enthusiastic about the fact that he learned from is students how to present the information in a clear way, something that will be useful in his research.
Mark Serva, Accounting & MIS	Professor Serva used wikis for his Emerging Technologies class, where students had a case study on Marriott Corporation, and for his Technology Management class, where it has been mostly used to support in-class debates. In order to center the information coming from Marriott executives (and avoid having all students overloading their email box and voicemail), the wiki became a question and answer space for the class project. He warns professors about the grading process, which can become difficult because of multiple factors, including working physically or using chat on the side, and overachievers, who can kill the discussion by writing a definitive answer from the get-go. Overall, he believes wikis are very efficient and have a low barrier to entry for anybody.

Each interviewee has been recorded, and an audio podcast is available online, along with screenshots, links, and other useful resources at the following URL:

<http://copland.udel.edu/~mathieu/wiki/index.html>

3. Lessons Learned in Defining Wiki Usage in a Course

A wiki is a tool which can be used in multiple ways. It would be very misleading to define one best practice for using wikis in higher education, since their use will be different from one course to the other, depending on the professor's teaching style and the course's learning objectives.

As most of the interviewees at University of Delaware stated, even though most of today's college students have never used a wiki before, they become wiki-savvy quite painlessly. The adoption or the failure of the wiki depends in great part of the original design of the intended learning activity and its fit with the wiki philosophy.

3.1 Instructional Strategy

As a starting point, let's define a pedagogical framework that can help understand the real value of wikis in education. Carmean and Heafner, under an EDUCAUSE initiative, defined *Five Learner-Centered Principles for Deeper Learning*. In order to have a better impact on the learner, the learning experience must be **active, social, contextual, engaging** and **student-owned**.²⁴ It is easy to see that wikis have an excellent potential to help achieve all – or at least some – of these principles.

Another framework that has been largely in use for two decades is the *Seven Principles for Good Practice in Undergraduate Education* by Chickering and Gamson. According to their findings, good practice in undergraduate education:

- encourages contact between students and faculty,
- develops reciprocity and cooperation among students,
- encourages active learning,
- gives prompt feedback,
- emphasizes time on task,
- communicates high expectations, and
- respects diverse talents and ways of learning.²⁵

Keeping in mind these frameworks, how can your wiki activity help your students achieve the learning objectives you are setting for them? Which observable knowledge, behavior, attitude, or skill should your students be able to demonstrate at the end of your course? Which instructional gap are you trying to fill in with your wiki? How are you going to assess student achievement?

²⁴ Colleen Carmean (2003), *Learner-centered principles*, EDUCAUSE NLII, [Online], retrieved 11/12/2007. <http://www.educause.edu/MappingtheLearningSpace/2594>

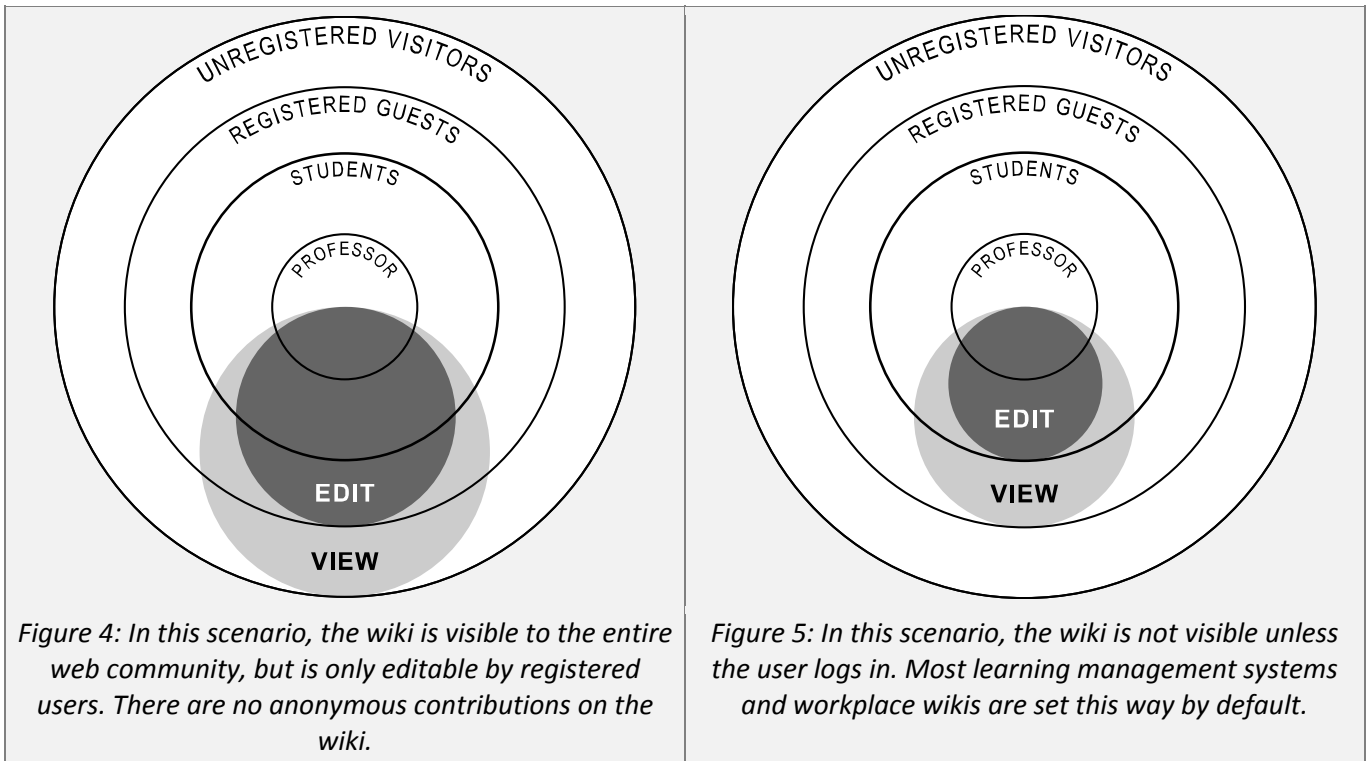
²⁵ Chickering, A. W., Gamson, Z. F., & American Association for Higher Education, Washington, DC. (1987). *Seven principles for good practice in undergraduate education*. AAHE Bulletin, 3.

3.2 Control and Ownership Issues

Wikis are, by nature, open. Being open means that contents are, by default, visible to everybody. There are two issues here which have to be addressed: permissions and copyright.

3.2.1 Permission Issues

Figure 4 and 5 show the target audiences and the permission sets of two scenarios of wiki usage.



Instructors have to think about the purpose of their wiki and the impact of having it public versus private. Some students might not like the idea of sharing their formative thoughts to the entire world, while other might want to be fully transparent. And some wiki pages might also be fully controlled by the faculty member only, or reserved to a specific group of students to discuss group-related issues that should not be visible to other participants. You are encouraged to refer to the *wiki features continuum* (figure 3) to determine the kind of wiki environment that would suit your needs.

3.2.2 Copyright Issues

Is there any content on the wiki that cannot be shown outside the course community without infringing copyright laws? Some contents might be shared under fair use for educational purposes, but cannot be replicated or redistributed if the wiki is entirely public. Any participant can post content to a wiki, even students.

If you plan to reuse the content which has been developed in a wiki for upcoming semesters, or to be published on the web somewhere, you have to make sure students are aware of that fact and that they agree to see their collective content be reused, remixed, and repurposed. Writing it down in your syllabus, making students sign

waivers, and defining copyright in your wiki charter (see point 3.5) are all valid alternatives. Discussing copyright issues and fair use with your students from the get-go will promote a proper use of your wiki throughout the course, or, at least, give the instructor ground for disciplinary actions if necessary.

3.3 Individual, Team, and Class Contribution

By design, a wiki is a collaborative space, owned and edited by anyone. But there are some circumstances which require more individuality, privacy, and ownership. A wiki can be appropriate in these situations, as long as the following conditions are met:

1) **Users are registered:** It is possible to track changes and associate a user with them. That way, if a user changes a page or a section that is reserved to some other users, it is possible to revert that change or take some actions against that user.

2) **Content can be viewed by everyone:** Most wiki tools don't have a feature that hides some pages from a registered user, which means that even if a user is not allowed to make a change, the content is still viewable.

An example of a bad use of a wiki would be asking students to individually post their answers to an assignment that has a limited scope of answers. When a first student will have his/her answer posted, others might be tempted to have a quick look for inspiration. A drop box or an email attachment would be better strategies in such a case.

It is very easy to create individual pages for each students or team spaces. The only thing instructors must make sure of is that students know where these "soft" boundaries are. This is definitely something that should be addressed in a wiki charter, if necessary (see point 3.5).

3.4 Templates

By using a template, you create a zone between a blank page (which could lead to a usability disaster) and a pre-built autocratic structure (which could lead to fear of making mistakes or plain boredom). Most wiki tools offer the opportunity of modifying the default template page (the blank page that is presented by default when any user creates a new page). That default page is a perfect place to promote best or common practices in the wiki. If you want, for instance, your users to always put a title, a little description of what is on this page, and a navigation bulleted list with anchors for the sections of that page, you could create a default template that would look like the following (table 4):

Table 4: Example of a default page.

Wiki markup language*	Visual output
<pre>h1 Insert the title of your page here __Description:__ Insert a short description of the content of your page here (around 200 words, maximum) * [Alias of your first item #First] * [Alias of your second item #Second] {anchor:First} h2 First Item {anchor} Type your content here {anchor:First} h2 Second Item {anchor } Type your content here</pre>	<p>Insert the title of your page here</p> <hr/> <p>Description: Insert a short description of the content of your page here (around 200 words, maximum)</p> <ul style="list-style-type: none"> • Alias of you first item • Alias of your second item <p>First Item</p> <p>Type your content here</p> <p>Second Item</p> <p>Type your content here</p>

* For this example, the wiki markup language of Sakai has been used.

3.5 Understanding the Markup Language

Some users get very frustrated of the fact that they cannot, in a wiki, format the information in the same way as in Word or in HTML. Simplicity has its cost. If your students want to add something fancy on a wiki, they probably need to build it in another tool and import it as an image, or link to a PowerPoint file they created. The goal of the wiki is to create mostly written content. This is what it is good for.

Even though wiki markup language is pretty easy to use, some people will be reluctant to “code” a page. It is imperative to train your users to be proficient with the most common markup language, as a starting point. Sometimes, the Help file is not enough, or way too much. You will find at Annex A a job aid that has been created to help student get started with the wiki markup language in Sakai.

3.6 Wiki Charter and Etiquette

A wiki charter is the equivalent of the syllabus for the entire course: it defines the usage, the expectation, the conventions, and the accepted behavior within the wiki. It is a code of conduct that can be set in stone from the beginning by the professor, or negotiated as the need emerges by the entire community.²⁶

The wiki charter can act as a code of conduct, a kind of contract based on the willingness of each participants to be a good e-citizen. Sometimes, the charter can define ways to use the wiki that go beyond the technological capabilities. For instance, teams can be assigned a specific set of pages to edit into and asked to avoid editing other pages, even though the wiki cannot prevent them to edit any of the pages. See Annex B for an example of wiki charter to start from.

3.7 Using the Wiki Beyond the Wiki

A wiki is a working space. It is an unpolished web page which can be edited by anyone. Content developed in a wiki doesn't have to stay in a wiki. The wiki can be the process in its entirety, or it can be one or more steps in a larger workflow which leads to another kind of media.

Point 1.3 summarizes the strengths of wikis. You could, for instance, use a wiki to build a scenario for a video project, where the final product will be the video, not the wiki. Or you could have student post an individual assignment they did with a text editor on a wiki and use it to summarize the class' collective knowledge.

²⁶ This idea of a wiki charter has been inspired by Mader, Stewart (2008).

4. Conclusion

A wiki is not meant to be true, it's meant to be discussed. Wikis are transparent; not only do they show the final product, they reveal the entire creative process. A wiki is one of the tools that are now available to all to become more literate, not only by increasing writing skills, but by understanding what this new media literacy really means. They are also a fun and engaging way to develop collaborative and teamwork skills.

As a faculty member, you might choose not to use a wiki in your course. But students are now empowered in the use of web 2.0 technologies. They are using Facebook or Google Docs to create study groups. They are using their cellphones to keep in touch with their friends through social networking applications, texting each other in real time, accessing the web to find the information they need just-in-time. The impact of technology on society is clearly observable. As educators, it is our duty to reflect on these technologies and behaviors in order to detect and implement innovative ways to enhance student learning and develop their 21st century skills, the ones they will need to survive professionally in a highly networked environment.

Bibliography

- Barton, Matt (2004). *Embrace the Wiki Way!*, Personal Blog. Retrieved October 10, 2007.
- Carmean, Colleen (2003). *Learner-centered principles*, EDUCAUSE NLII. Retrieved November 12, 2007.
<http://www.educause.edu/MappingtheLearningSpace/2594>
- Chickering, A. W., Gamson, Z. F., & American Association for Higher Education, Washington, DC. (1987). *Seven principles for good practice in undergraduate education*. AAHE Bulletin, 3.
- Cunningham, Ward (1995), *Wiki History*. Retrieved November 9, 2007. <http://c2.com/cgi/wiki?WikiHistory>
- Edmonds, Rob (2006, October). *Up from the grassroots*. E.learning Age, 14-16. Retrieved October 26, 2007, from ABI/INFORM Global database (Document ID: 1151038921).
- Foord, Dave (2007). *The STOLEN principle Tick List*, A6 Training and Consultancy. Retrieved December 10, 2007.
http://www.a6training.co.uk/resources_Social_Software.php
- Foster, Andrea (2007). *Software Group Gets Online Textbooks to the Developing World*, The Chronicle of Higher Education, November 16, 2007. Pages A28-A29.
- Grenier, Brian (2007), *Wikis in the Classroom*, El Paso Independant School District. Retrieved October 26, 2007.
<http://www.slideshare.net/briangrenier/wikis-in-the-classroom-34105>
- James, Heather (2004). *Aiming for communal constructivism in a wiki environment*, Kairosnews.org, May 27, 2004. Retrieved December 21, 2007. <http://www.kairosnews.org/node/3809>
- Lamb, Bryan (2004), *Wide Open Spaces: Wikis, Ready or Not*, EDUCAUSE Review, vol. 39, no. 5 (September/October 2004). Pages 36-48.
- Lesser, Eric (2007). *Closing the Generation Divide: Shifting Workforce Demographics and the Learning Function*, IBM Institute for Business Value. Retrieved November 29, 2007. <http://www-935.ibm.com/services/us/index.wss/ibvstudy/gbs/a1025581?cntxt=a1005263>
- Mader, Stewart (2008). *Wikipatterns: a practical guide to improving productivity and collaboration in your organization*, Wiley, Indianapolis. ISBN: 978-0-470-22362-8.
- Olanoff, Lynn (2007). School officials unite in banning Wikipedia, The Seattle Times, November 21, 2007. Retrieved December 20, 2007.
http://seattletimes.nwsourc.com/html/living/2004025648_wikipedia21.html
- Proehl, Geoff (2008). *Geoff Proehl on the Theatre Arts Wiki*, University of Puget Sound, posted on April 30, 2008. Retrieved May 1, 2008. <http://itech.ups.edu/showcase/geoff-proehl-oberon>
- Regan, Keith (2007). *Google's Knol Initiative - the Unwiki?*, TechNewsWorld, December 14, 2007. Retrieved December 20, 2007. <http://www.technewsworld.com/rsstory/60789.html?welcome=1198189346>
- Richardson, Will (2006). *Blogs, wikis, podcasts, and other powerful web tools for classrooms*, Corwin Press, Thousand Oaks CA. ISBN: 978-1412927673.

Schacht, Paul (2006). *The Wiki Collaborative Writing Project*, in Mader, Stewart, Using Wiki in Education.
<http://wikiineducation.com>.

Shannon, Victoria (2007). *A group approach to teaching teachers*, International Herald Tribune, November 25, 2007. Retrieved December 21, 2007.
http://www.iht.com/articles/2007/11/25/technology/curriki26.php#end_main

Shareski, D., & Winkler, C. A. K. (2006). *Are wikis worth the time?*, Learning and Leading with Technology, 33(4), 6.


Shirky, Clay (2003). *Wikis, Graffiti, and Process*, Many-To-Many: Social Software, August 26, 2003.
<http://many.corante.com/20030801.shtml>

Turnbull, Giles (2004). *Talking to Ward Cunningham about Wiki*, luvly, April 6, 2004.
<http://gorjuss.com/luvly/20040406-wardcunningham.html>.

Various authors (2007), *Why Wiki Works*. Retrieved November 25, 2007. <http://c2.com/cgi/wiki?WhyWikiWorks>

MOST COMMON MARKUP NOTATION IN THE SAKAI WIKI TOOL

Item	Code	Usage	Visual Output on Page
Headings	Heading 1: <code>h1</code> Heading 2: <code>h2</code> Heading 3: <code>h3</code> And so on ...	Start a new line with the code at the beginning: <code>h1 Title of the Page</code> <code>h2 Title of a Section</code>	TITLE OF THE PAGE <hr/> TITLE OF A SECTION
Paragraphs	None	Leave an empty line and start typing: <code>Content of this paragraph.</code> <code>Other paragraph.</code>	Content of this paragraph. Other paragraph.
Bulleted list	Asterisk: <code>*</code> Lower level: <code>**</code>	Use the asterisk at the beginning of a new line with a space after: <code>* Item One</code> <code>* Item Two</code> <code>** Indented Item</code>	<ul style="list-style-type: none"> • Item One • Item Two <ul style="list-style-type: none"> ◦ Indented Item
Numerical list	Pound sign: <code>#</code> Lower level: <code>##</code>	Use the pound sign at the beginning of a new line with a space after: <code># Item One</code> <code># Item Two</code> <code>## Indented Item</code>	<ol style="list-style-type: none"> 1. Item One 2. Item Two <ol style="list-style-type: none"> 1. Indented Item
Font styles	Underscore (bold): <code>__</code> <code>__</code> Tilde (italic): <code>~~</code> <code>~~</code> Hyphen (strikethrough): <code>--</code> <code>--</code>	Place 2 copies of the code character on each side of your content with NO SPACES: <code>This is __bold__, this is ~~italic~~, and this is --strikethrough.--</code>	This is bold , this is <i>italic</i> , and this is strikethrough .
Changing a font color	Color macro (curly brackets) , colon, and pound sign: <code>{color:#} {color}</code>	Put a text between an opening and closing color macro, with the desired color name or hexadecimal color code. <code>{color:red}Red{color}</code> , <code>{color:green}Green{color}</code> , <code>{color:#FFCC33}Gold{color}</code>	Red, Green, Gold
Creating a link †	Square brackets: <code>[]</code>	To create a link to another wiki page, put a word or a sentence between square brackets: <code>[New Page Link] here</code> This code will create a link to a page named "New Page Link". If the page doesn't exist, a question mark (?) will appear immediately after the link in view mode. Click on the link to create the page.	New Page Link? here
Creating a link with an alias	Square brackets and vertical line: <code>[]</code>	To create a link to another wiki page using an alias, put a word or a sentence between the opening square bracket and a vertical line followed by the page name: <code>[Click here to access this other page Other Page]</code> This code will create a link to a page named "Other Page". If the page doesn't exist, a question mark (?) will appear immediately after the link in view mode. Click on the link to create the page.	Click here to access this other page?
Creating a link to an anchor (a specific location in the current page)	Square brackets, vertical line, and pound sign: <code>[#]</code> Anchor macro (curly brackets) and colon: <code>{anchor:} {anchor}</code>	The following code will create a link that is internal to a page: <code>[Link to an anchor named Topic One #Topic One]</code> <code>{anchor:Topic One}</code> <code>h2 Topic One</code> <code>{anchor}</code> P.S.: You must close an anchor by adding <code>{anchor}</code> after a target content.	Link to an anchor named Topic One <hr/> TOPIC ONE

Item	Code	Usage	Visual Output on Page									
Creating a link to an anchor in another page.	Square brackets, vertical line, and pound sign: [#] Anchor macro (curly brackets) and colon: {anchor:pageName#anchorName} {anchor}	The following code will create a link to an anchor in another page: [Link to an anchor within a different page page name#Topic One]	Link to an anchor within a different page									
Creating a link to a URL	Type the URL with the http:// before or use the Link macro. {link:alias URL}	Simply paste the URL including the http:// http://www.sakaiproject.org Or {link:Sakai Project http://www.sakaiproject.org}	http://www.sakaiproject.org Sakai Project									
Creating a link to a personal resource	Use the button in the wiki edit tool bar.	Create an alias for your link and select it: PowerPoint Slides Link Click on the Link button. Scroll down and click on Show other sites . Select My Workspace . Click on Add > Upload Files . Select your file on your computer. Scroll down and click the Continue button.	PowerPoint Slides Link									
Creating a table	Table macro (curly brackets) and vertical lines: {table} {table}	To create a table, follow the following pattern. All cells are separated by a vertical line. All rows are separated by a line break. {table} Column 1 Header Column 2 Header Column 3 Header Item 1 Content 1 Content 2 Item 2 Content 3 Content 4 {table} P.S.: You must close a table by adding {table} at the end on a new line.	<table border="1"> <thead> <tr> <th>Column 1 Header</th> <th>Column 2 Header</th> <th>Column 3 Header</th> </tr> </thead> <tbody> <tr> <td>Item 1</td> <td>Content 1</td> <td>Content 2</td> </tr> <tr> <td>Item 2</td> <td>Content 3</td> <td>Content 4</td> </tr> </tbody> </table>	Column 1 Header	Column 2 Header	Column 3 Header	Item 1	Content 1	Content 2	Item 2	Content 3	Content 4
Column 1 Header	Column 2 Header	Column 3 Header										
Item 1	Content 1	Content 2										
Item 2	Content 3	Content 4										
Adding an image	Use the button in the wiki edit tool bar.	Put you cursor where you want your image to be. Text (<i>cursor here</i>) Click on the Image button. Scroll down and click on Show other sites . Select My Workspace . Click on Add > Upload Files . Select your image file on your computer (JPEG, PNG or GIF). Scroll down and click the Continue button.	Text 									
Using a markup character as is	Backslash: \	To show a character which usually triggers a code, use the escape character, '\' before that character. [This is a link] \[This is not a link\ * this is a bullet point * this is not a bullet point	This is a link [This is not a link] <ul style="list-style-type: none"> this is a bullet point * this is not a bullet point									

† About wiki pages:

A wiki page must have a unique name. There is no folder structure in a wiki. Make sure you follow the naming convention to avoid confusion.

Course Wiki Charter - DRAFT

By Mathieu Plourde, Instructional Designer, University of Delaware. mathieu@udel.edu

Feel free to copy, paste, remix, add, or rewrite any information in this document to suit your needs.

A wiki is a different way to communicate and collaborate. To really leverage this technology, it is essential to establish some usage guidelines.

Information Architecture

In a wiki, there is no actual hierarchy. Each new page is created on the root level. The navigation hierarchy of a wiki site is determined by the incoming and outgoing links created by the users. This implies that each page must have a unique name.

Since a wiki is built by its community, it has a tendency to become messy. If you feel like the information should be presented in another way, another order, use a navigation scheme, etc. Do not hesitate to do some [wiki gardening](#).

Each wiki page also has a Comment feature. To add a comment to a page, click on the Comment link which is available at the bottom of each page.

Authorship

Except when otherwise specified (see [Page Types](#)), a wiki is a collaborative space that can be created or edited by anyone in the course. Users should not be overly protective of their words in a wiki, since doing so would block collaboration and the collective writing process. When writing down something in a wiki, expect your content to be edited. See [Wiki Etiquette](#) for further details on accepted behavior in a wiki.

Versioning

A wiki page keeps track of every edit. Any wiki page can be compared to or reverted to a previous state. Since users are logged in, every edit is associated with an [author](#). The current version of a page always shows who and when it has been edited for the last time at the bottom of the page.

Page Types

Home Page

The Home page is the central hub where all other second level pages are linked. The second level pages can be assignment descriptions, team space, individual spaces, and any other announcement or information that is judged appropriate. It is usually edited by the instructor only.

Assignments

Assignment pages are used to describe the different assignments that students will have to accomplish during the semester. They are usually edited by the instructor only.

Individual Student Space

One of the goals of this course is to promote openness in pedagogy. Each student will be assigned a wiki page to publish their work in progress. Until a specific deadline, consider this space as a sandbox where you can brainstorm, experiment, link to resources, etc. You are also invited to visit other student spaces and to get involved in their reflection by constructively commenting their work.

You are allowed to create sub-pages in your individual space. To [create a new page](#), you need to create a link to the page first by putting a word or a sentence [between square brackets] (see [Wiki Markup Language](#)). Since a lot of people will be using this wiki, you will need to respect a [naming convention](#).

Team Spaces

If there are team activities in the wiki, you might be assigned a team space to collaborate on a specific project. It is the group's responsibility to get structured in a way that will make their work effective. This space can be used to write down actual content, to serve as a calendar and an agenda for meetings, to share thoughts or links... It's all up to you.

Collective Notebook

This space is designed to write down anything that would be of interest to the whole group. Any participants can add or edit information in there about the theory, experiences, good practices, relevant links, comments, thoughts, questions, books, articles, etc. At the end of the semester, it will be as good a reference as the effort the community has put into it.

Page Creation and Naming Convention

Because of the information architecture of wikis, everyone will need to respect a naming convention. The naming convention is as follows:

(Lastname)(Firstname)(NameofthePage)

Consider the following example:

"John Doe" wants to create a page named "Citations and Links" on his student page to store all his citations and web links.

1. He navigates to his own [student page](#).
2. He clicks on the Edit tab.
3. He scrolls down to the exact place where he wants his links to be.
4. He types the exact following code on a line: [Citations and Links|DoeJohnReferences]
 - a. The part between the opening square bracket "[" and the vertical line "|" is called the alias. It is what users will see when navigating your page.
 - b. The part between the vertical line "|" and the closing square bracket "]" is the destination wiki page name. Using an Uppercase at the beginning of each word and using CamelCase (squeezing words together) is suggested but not necessary.
5. He clicks the Save button at the bottom of the page.
6. Back in View mode, the link "[Citations and Links?](#)" is now visible. The question mark following the link indicates that the destination page does not exist yet. To create the page, he clicks on the link.
7. He has now created the page. A new page always uses the default template. He edits the page to customize it to his own needs.

Once a page has been created, you can link to it from any wiki page by creating a link to the exact page name (see [Wiki Markup Language](#)).

Notifications

If you are interested in tracking the evolution of a particular page, you can get notified by email by clicking on the Watch link of the wiki tool bar. Follow the onscreen instructions to select the kind of follow-up you desire.

You can also subscribe to the RSS feed of the whole wiki site to get noticed of every edit. To do so, click on the RSS logo on the top right corner of the wiki tool bar. You will need a RSS feed reader to use this feature.

Wiki Gardening

Wiki Gardening is the act of reorganizing the content to make it more usable to the community. Wikis have a tendency to become messy, so sometimes it might become useful if not necessary to clean them up a little by using any of the following techniques:

- Adding navigation on the top of the page to link to different sections of it (using [anchors](#)).
- Surfacing the relevant information at the top of the page.
- Organizing the information using relevant information architecture (using [heading levels and styles](#)).

Wiki Markup Language

Wiki Markup Language is a simplified markup language that is used in edit mode. It has some similarities with HTML, but has intentionally significantly fewer capabilities in order to keep it really simple to use.

When editing a page, there is always a quick markup guide available at the right of the screen to show you how to use the basic and most common functions. There is also a link to the complete markup guide in that same space.

Since that guide is dynamic, there is no need to copy it in this space.

Wiki Etiquette

Here are a few simple rules of general etiquette:

1. Maintain civility. At all times, show proper respect for other readers and to the subjects of your work (e.g., authors of published articles). Do not criticize them personally and keep all comments about their work constructive.
2. Give proper credit for borrowed work. In other words, don't plagiarize by putting text taken from another source on the wiki without proper referencing (that includes images as well as text). Give credit to the original authors of an idea, just like you would do it in a paper. Do not make minor changes to other people's work on the wiki and claim the page as your own.
3. Identify yourself: To avoid conflicts, always indicate who you are when commenting. If you are changing the wording of a text, mark your change in another text color or style and write down your initials.
4. Stay on topic. Resist the temptation to begin pages on topics outside the domain of the course (no movie reviews, chocolate chip cookies, or personal diaries).
5. Flaming, sabotage and bullying will not be tolerated. The wiki is a course environment and therefore is considered under the same university policies regarding these inappropriate behaviors.

Pages that deviate from these rules will be deleted or edited by the instructor.

Reference: This section has been largely inspired by Philip Farabaugh of UMBC (2005)

Sources

Farabaugh, Philip (2005), "*BIOL414/614 at UMBC – Wiki Etiquette*," University of Maryland, Baltimore County, Retrieved online on 2/27/2008,

http://www.umbc.edu/biobio/biol414/wiki/index.php?page=Wiki_Etiquette

Plourde, Mathieu (2005), "*Forums de discussion : meilleures pratiques et conseils*," Université Laval, Retrieved online on 2/27/2008,

<http://www5.fsa.ulaval.ca/sgc/servicesressources/environnementtechnologique/azimut/intranetfsawebct/pid/1329>

Multiple Contributors (2008), *Wikipatterns.com*, Retrieved online on 2/27/2008,

<http://www.wikipatterns.com/display/wikipatterns/Wikipatterns>