A case study of Wiki as a Teaching Tool.

Wiki for interdisciplinary Math Biology Courses

Rahul

Department of Applied Mathematics
University of Waterloo
Waterloo, ON N2L3G1, Canada

26 April 2012

Outline of the talk

- Introduction.
- Wiki technology:
  - Definition of wiki.
  - Technical advantage of wiki.
  - Using wiki in Classroom.
- Examples of wiki use in teaching:
  - 2 examples from Journals.
  - 1 example of use in the University of Waterloo.
- Wiki for interdisciplinary Math and Biology courses:
  - Examples of existing use of wiki.
  - Possible extension of wiki in classroom teaching.
- Summary

Introduction

- Using course website for university courses is now standard.
- Wiki provides an alternative tool for creating websites for course management.
- Wiki can be used effectively to achieve specific course learning goals like peer assistance.
- We will explore the features of wiki based website relevant to teaching.

Definition of wiki

- Wiki is a website whose contents can be edited and managed by the users of the website collaboratively.
- The term "wiki" is derived from the Hawaiian phrase, "wiki-wiki" which means quick.
- Wiki provides an alternative way of creating web pages other than widely used HTML and PHP.
- Examples: mediawiki, wikidot, twiki are some of the popular wiki software tools which are used to develop wiki websites.

Unique features of wiki website

- Provides easy interface to create web pages collaboratively.
- Multiple users can edit wiki concurrently and multiple pages can be linked to each other.
- Wiki features include easy editing, version control and open-source.
- Can create community of active learners who can build and develop their own topics.
- Wiki supports the math equation typesetting through TeX.

Wiki as an educational technology

Following are the some possible uses of wiki as a teaching tool [1]:

- Wiki can be used to develop research project reports by students.
- Wiki can be used to motivate students to write summaries, create bibliography, write glossary and similar activities.
- Wiki can be used by teachers as knowledge resource to share practices, reflections and discussion regarding teaching practices.
- Wiki can be used to create a pages for brainstorming which can be easily linked to related resources.
- Wiki can be very useful for group authoring like creating a report collaboratively.

[1] Parker and Chao [Parker and Chao, 2007]

Suggested practices for using wiki as a course website [2]

- Wiki website's home page should have links of manual for creating and editing wiki pages.
- Wiki home page should have page of frequently asked questions (FAQs) with answers of common questions related to wiki usage.
- Provide orientation lecture in which discuss important aspects of wiki usage, like privacy, plagiarism, learning goals and other similar topics.
- Address concerns of individual students, if there is any regarding wiki editing and usage.

[2] Cowan and Jack [Cowan and Jack, 2011]

Example 1

Peterson, E. (2009). Using a Wiki to Enhance Cooperative Learning in a Real Analysis Course. Primus, 19(1):18-28 [a].

[a] Peterson [Peterson, 2009]

- The author used the wiki website to:
  - Share course material.
  - Maintain discussion forum.
  - Facilitate collaborative projects.
  - Develop glossary of terms for the course.
  - Project report editing.
- *Glossary of Term:* Students developed a comprehensive term list for each module of the course.
- Wiki was very effective in writing reports since wiki supports equation typesetting through TeX.

Example 2

Carter, J. F. (2009). Lines of Communication: Using a WIKI in a Mathematics Course. Primus, 19(1):1-17 [a].

[a] Carter [Carter, 2009]

- The author had used wiki for teaching math courses for over four years.
- The author summarized that wiki has led to improvement in:
  - Peer student interaction.
  - Participation of students in class.
  - Office hour visit.

Example of wiki use at the University of Waterloo

Dr. Ali Ghodsi
Department of Statistics and Actuarial Science
University of Waterloo

- WikiCourseNote media-wiki based wiki course website.
- Web address:
  `http://www.wikicoursenote.com/wiki/Main_Page`.
- I took Stat 946 in Fall 2010 and wiki was used for:
  - Writing paper summary collaboratively.
  - Writing project proposals. *Not complete project report.*

Why wiki for Computational Biology?

- Biology research is evolving into interdisciplinary investigation which involves skills from Math, Biology and Physics.
- Demands for training undergraduate and graduate students for interdisciplinary research is increasing [3].
- Many new courses and programs had been introduced in the university curricula.
- The objective is to use wiki to promote collaborative learning skills in the interdisciplinary courses.

[3] BIO2010 `http://www.ncbi.nlm.nih.gov/books/NBK43511/`

Example of wiki use in Computational Biology

- Openwetware is media-wiki based lab protocol sharing website.
  Web address: `http://openwetware.org/wiki/Main_Page`

- The international genetically engineered machines competition (IGEM) utilizes media-wiki based wiki website to share projects of different teams.
  Example: Waterloo IGEM team web address,
  `http://2010.igem.org/Team:Waterloo`.

- Open Source Drug Discovery, a recent initiative to draw attention of scientist towards neglected tropical diseases (like Malaria), uses wiki website for knowledge sharing.

Example of wiki use in Computational Biology Courses

Prof. Ramakrishna Ramaswamy
Jawaharlal Nehru University
Course: Systems Biology

Dr. Andrew Mark Lyn
Jawaharlal Nehru University
Course: Bioinformatics

- The class had two groups of students: biology and Math Majors.
- In order to improve learning wiki was utilized in the following ways:
  - Wiki was used to develop glossary of terms.
  - Writing individual project reports.
  - Creating list of specialized databases.

Summary

- Wiki can be used effectively to achieve specific learning goals for the course.
- Care should be taken in addressing concerns of students regarding wiki usage.

References


Carter, J. F. (2009).
Lines of Communication: Using a WIKI in a Mathematics Course.
Primus, 19(1):1–17.


Cowan, B. R. and Jack, M. A. (2011).
Exploring the wiki user experience: The effects of training spaces on novice user usability and anxiety towards wiki editing.
Interacting with Computers, 23(2):117–128.


Parker, K. R. and Chao, J. T. (2007).
Wiki as a Teaching Tool.
Learning, 3.


Peterson, E. (2009).
Using a Wiki to Enhance Cooperative Learning in a Real Analysis Course.
Primus, 19(1):18–28.

Acknowledgment

My PhD Supervisor
Dr. Brian Ingalls
Department of Applied Mathematics
University of Waterloo.

Dr. Svitlana Taraban-Gordon
Centre for Teaching Excellence
University of Waterloo.

Thank you for Listening.

Discussion and Questions?