Social Computing in Education

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Department of Computer Science & Engineering
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Billionaires’ Shuffle

Facebook in 2004.02

2008 at 23 and $1.5 billion later...

William Gates

Warren Buffett

Carlos Slim Helu & family

Mark Zuckerberg

Carlos Slim Helu & family

William Gates
<table>
<thead>
<tr>
<th>Alexa as of Nov. 2008</th>
<th>USA</th>
<th>CHINA</th>
<th>Global</th>
</tr>
</thead>
<tbody>
<tr>
<td>1</td>
<td>Google</td>
<td>Baidu</td>
<td>Yahoo</td>
</tr>
<tr>
<td>2</td>
<td>Yahoo</td>
<td>QQ</td>
<td>Google</td>
</tr>
<tr>
<td>3</td>
<td><strong>Myspace</strong></td>
<td>Sina</td>
<td><strong>YouTube</strong></td>
</tr>
<tr>
<td>4</td>
<td><strong>YouTube</strong></td>
<td>Google.cn</td>
<td>Windows Live</td>
</tr>
<tr>
<td>5</td>
<td><strong>Facebook</strong></td>
<td>Taobao</td>
<td><strong>Facebook</strong></td>
</tr>
<tr>
<td>6</td>
<td>Windows Live</td>
<td>163</td>
<td>MSN</td>
</tr>
<tr>
<td>7</td>
<td>MSN</td>
<td>Yahoo</td>
<td><strong>Myspace</strong></td>
</tr>
<tr>
<td>8</td>
<td><strong>Wikipedia</strong></td>
<td>Google</td>
<td><strong>Wikipedia</strong></td>
</tr>
<tr>
<td>9</td>
<td>EBay</td>
<td>Sohu</td>
<td><strong>Blogger</strong></td>
</tr>
<tr>
<td>10</td>
<td>AOL</td>
<td>Youku</td>
<td>Yahoo.jp</td>
</tr>
</tbody>
</table>
What’s On the Menu?

- Web 2.0 and Social X
- Social Computing
- Social Computing in Education
What’s On the Menu?

- Web 2.0 and Social X
- Social Computing
- Social Computing in Education
Web 2.0

- Web as a medium vs. **Web as a platform**
- Read-Only Web vs. **Read-and-Write Web**
- Static vs. **Dynamic**
- Restrictive vs. **Freedom & Empowerment**
- Technology-centric vs. **User-centric**
- Limited vs. **Rich User Experience**
- Individualistic vs. **Group/Collective Behavior**
- Consumer vs. **Producer**
- Transactional vs. **Relational**
- Top-down vs. **Bottom-up**
- People-to-Machine vs. **People-to-People**
- Search & browse vs. **Publish & Subscribe**
- Closed application vs. **Service-oriented**
- **Services**
- Functionality vs. **Utility**
- Data vs. **Value**
Social Platforms

- Wikis, blogs, forums, groups, twitters, etc.
- Social Networking
- Social Search
- Social Bookmarking
- Social Media

- Social News/Mashup
- Social Knowledge Sharing
- Social Marketing
- Social Gaming/Human Computation
Social Networking
Social Search

- Social Search Engine
- Leveraging your social networks for searching
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Social Bookmarking

- all your bookmarks in one place
- bookmark things for yourself and friends
- check out what other people are bookmarking

Tags
A tag is simply a word you use to describe a bookmark. Unlike folders, you make up tags when you need them and you can use as many as you like. The result is a better way to organize your bookmarks and a great way to discover interesting things on the Web.

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Social Media
Social News/Mash Up
Social Knowledge Sharing

Wikipedia

- English: The Free Encyclopedia
  - 2,268,000+ articles

- Deutsch: Die freie Enzyklopädie
  - 718,000+ Artikel

- Français: L'encyclopédie libre
  - 631,000+ articles

- Polski: Wolna encyklopedia
  - 477,000+ hasł

- Español: La enciclopedia libre
  - 339,000+ artículos

- Português: A enciclopédia livre
  - 364,000+ artigos

- Svenska: Den fria encyklopedin
  - 227,000+ artiklar

Knol

- Share what you know
  - Write and post a knol (nööl) — a unit of knowledge.

- Search
  - Usable through popular search engines

- Create
  - easy to write and manage

- Control
  - each knol is owned by you, the author
Social Marketing

- Viral marketing
- Who are the brokers?
- Who can exert the most influence on buying/selling?
- How much should one advertise?
Social/Human Computation
Human Computation

[Image of Google Image Labeler interface with a picture of a lake and labels such as 'sky', 'water', 'blue', 'lake', 'mountain', 'my labels']
Web 2.0 Revolution

The Three C’s

Connectivity
Collaboration
Communities
What’s On the Menu?

• Web 2.0 and Social X
• Social Computing
• Some Interesting Problems
  • Collaborative Filtering
  • Query Suggestion
Social Relations

crew
teams
squad
organizations
cohorts
communities
populations
markets
groups
partners

binary
cardinal
integer
real

trust
presence
identity
social role
reputation
expertise

trust
presence
identity
social role
reputation
expertise

trust
presence
identity
social role
reputation
expertise

trust
presence
identity
social role
reputation
expertise

knowledge
ownership
accountability

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Social Computing (SC)

- Social computing is a general term for an area of computer science that is concerned with the intersection of social behavior and computational systems. (Wikipedia)

- A social structure in which technology puts power in communities, not institutions. (Forrester)

- Forms of web services where the value is created by the collective contributions of a user population.
Issues

• **Theory** and models

• **Search, mining, and ranking** of existing information, e.g., spatial (relations) and temporal (time) domains

• Dealing with **partial** and **incomplete** information, e.g., collaborative filtering, ranking, tagging, etc.

• **Scalability** and algorithmic issues

• **Security** and **privacy** issues

• **Monetization** of social interactions
Computational Intelligence

- Classification, clustering, regression, etc.
- New insights on the data
  - Social relations are often hidden (latent)
  - Change data from \((x, y)\) to \((x, c_1(x), c_2(x), \cdots, y)\)
  - \(c(x) = \) context in tags, relations, ratings, etc.
- Data type = binary, integer, real, cardinal, etc.
Organizational Chart
Social Network Chart

Authority vs. Importance

| 1.00  | Nancy (secretary) |
| 0.66  | Donna (supervisor) |
| 0.57  | Manuel (manager)  |
| 0.19  | Stuart (supervisor) |
| 0.17  | Charles (supervisor) |
| 0.08  | Kathy (secretary) |
|       | Tanya (secretary) |
| 0.02  | Fred (auditor)    |
| 0.00  | Sharon (auditor)  |
| 0.00  | Bob (auditor)     |
|       | Carol (auditor)   |
|       | Harold (auditor)  |
|       | Wynn (auditor)    |
|       | Susan (secretary) |
What’s On the Menu?

- Web 2.0 and Social X
- Social Computing
- Social Computing in Education
Categories of Educational Activities

- Media sharing
- Media manipulation
- Conversational arenas
- Online games and virtual worlds
- Social networking
- Blogging
- Social bookmarking
- Recommender systems
- Collaborative editing
- Wikis
- Syndication
## Media Sharing

<table>
<thead>
<tr>
<th>General</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Uploading and downloading media files for audience or exchange</td>
<td>Sites have emerged that welcome creative digital material organized by educators</td>
</tr>
</tbody>
</table>

### Zentation: Share video and powerpoint

### NoteCentric: Share university class notes

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# Media Manipulation

<table>
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<tr>
<td>Use web-accessible tools to design and edit digital media files</td>
<td>Provide graphical representations education materials</td>
</tr>
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</table>

**Examples:**

- **Thumbstacks**: Allow presentations to be built and played online
- **Googlelittrips**: Link literature to places or maps
# Conversational Arenas

<table>
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</thead>
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<tr>
<td>One-to-one or one-to-many conversations between internet users</td>
<td>Support educational conversations by a variety of tools</td>
</tr>
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</table>

**Think:** Teachers and students create learning projects, participate in a website competition...

**Chatmaker:** Users can create chat rooms for personal websites, blogs, newsgroups...

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Online Games and Virtual Worlds

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</thead>
<tbody>
<tr>
<td>Rule-governed games or themed environments that invite live interaction with other users</td>
<td>Develop multi-player online games for educational purpose</td>
</tr>
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</table>

**Vue:** Provide a virtual educational and research institute

**Schome:** An education system to support people in learning throughout their lives
Online Games: Second Life

Second Life is an online, 3D virtual world imagined and created by its Residents.
## Social Networking

<table>
<thead>
<tr>
<th>General</th>
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</tr>
</thead>
<tbody>
<tr>
<td>Websites that structure social interaction between members who form subgroups of ‘friends’</td>
<td>Typically include education-oriented friendship groups</td>
</tr>
</tbody>
</table>

**Schoolnetglobal**: Provides a child-oriented design and security service for cross-site collaboration.

**Learnhub**: Teachers can create learning communities.

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## Blogging

<table>
<thead>
<tr>
<th>General</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td>An on-line journal or diary in which a user can post text and digital material while others can view and comment</td>
<td>Blog sites exist especially for students and teachers</td>
</tr>
</tbody>
</table>

**Edublogs**: Blogging for teachers and students

**Nature**: Encourages scientific authors to blog around their findings

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## Wikis

<table>
<thead>
<tr>
<th>General</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web-based services allow users unrestricted access to create, edit and link pages</td>
<td>Sites that allow students and teachers to establish their own wiki with an educational slant</td>
</tr>
</tbody>
</table>

**Pbwiki**: students and teacher can create their own wiki

**Wikiversity**: devoted to learning resources, learning projects, and research for use in all levels, types, and styles of education
# Social Bookmarking

<table>
<thead>
<tr>
<th>General</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Allow users to submit their bookmarked web pages to a central site where they can be tagged and found by others</td>
<td>Bookmarks sharing systems designed for research and education users</td>
</tr>
</tbody>
</table>

**BibSonomy**: A system for sharing bookmarks and list of literature  
**Citeulike**: A website for the collecting and sharing research publications
## Recommender Systems

<table>
<thead>
<tr>
<th>General</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Websites aggregate and tag user preferences to make novel recommendations</td>
<td>Recommender systems designed for research and education users</td>
</tr>
</tbody>
</table>

**Ratemyteachers:** An (infamous) example of recommendation technology in education involves user evaluation of teachers.
# Collaborative Editing

<table>
<thead>
<tr>
<th>General</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Web tools used collaboratively to design, construct and distribute digital product</td>
<td>Text, spreadsheets and other documents can be stored centrally and permit collaborative editing</td>
</tr>
</tbody>
</table>

**Thinknatur**e: Websites incorporate more visual tools for collaborative pages  
**Bubbl.us**: Some emphasizing mind-maps for brainstorming
# Syndication

<table>
<thead>
<tr>
<th>General</th>
<th>Educational</th>
</tr>
</thead>
<tbody>
<tr>
<td>Users can ‘subscribe’ to RSS feed enable websites so that they are automatically notified of any changes or updates in content via aggregator</td>
<td>Websites from which students can take advantage of syndicated content</td>
</tr>
</tbody>
</table>

**Podcastschool:** A website contains podcasts for school students

**Stanford:** A website contains syndicated material sponsored by Stanford
Evolution of Learning and Training

distance learning
d-Learning

electronic learning
e-Learning

mobile learning
m-Learning
Categories of Learning

- Contact Learning (face-to-face)
- Flexible Learning
- Distance Learning
  - Online Learning
  - Mobile Learning
- Paper-based Distance Learning
  - E-Learning
e-Learning

• A subset of technology-based training and encompasses all learning activities conducted on the internet

• Can be “live” (also known as “synchronous”) learning, meaning students communicate with peers and instructors in real-time, or it can be completely self-paced, which is known as “asynchronous” learning

• Covers a set of applications and processes, including
  • Computer-based training
  • Web-based learning
Universities.com has organized the most extensive collection of Post-Secondary distance learning and on-campus colleges and universities.

Distance Learning & Online Education
Browse and search 1164 Distance Learning degrees online.

Our most popular distance learning degrees: Masters in Education, PhD in Education - Doctor of Education, PhD in Psychology, Bachelor of Business Administration, Masters in Healthcare Administration, Masters in Psychology, Masters in Nursing, MBA Programs Business Administration, Masters in Human Resources, Doctor of Business Administration, PhD in Healthcare Administration, Bachelor in Engineering, Bachelor in Criminal Justice, PhD in Organization and Management -Doctor of Management, Bachelor in Accounting, Bachelor in Information Technology, Bachelor in Healthcare Administration, Masters in Information Technology, PhD in Information Technology, Masters in Criminal Justice.

On-Campus
For On-Campus degrees make sure to visit our on-Campus section by clicking on the links on your left under [On-Campus].
### What is m-Learning?

<table>
<thead>
<tr>
<th>New Learning Paradigms</th>
<th>Mobile Technologies</th>
</tr>
</thead>
<tbody>
<tr>
<td>Individual/Learner centered</td>
<td>Personalized Services</td>
</tr>
<tr>
<td>Collaborative learning</td>
<td>Networked/Wireless</td>
</tr>
<tr>
<td>Situated learning</td>
<td>Mobile awareness</td>
</tr>
<tr>
<td>Contextual learning</td>
<td>Context awareness</td>
</tr>
<tr>
<td>Ubiquitous learning</td>
<td>Ubiquitous</td>
</tr>
<tr>
<td>Life long</td>
<td>Durable</td>
</tr>
</tbody>
</table>
What is m-Learning?

- Refers to the use of mobile and handheld devices in teaching and learning
- Mobile implies movement and mobility--to learn “on the go”
Why m-Learning?

• Enhance learner’s success

• **Real** world skills

• Access learning materials from **anywhere** and **anytime**

• **Just-in-time** learning--reference tool for quick access to data in the field

• **Interact** with others

• **Collaborate** learning
m-Learning Devices

- PDAs
- Tablet PCs
- Mobile phones
- Wearable computers
- Laptop computers
- E-book readers
- Hybrid devices
iPhone in Medicine

Multi-planar reconstruction data sets

Medical resources developed for the iPhone can be used by students and practitioners

http://jeffreyleow.wordpress.com/2008/06/10/iphone-in-medical-education/

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MIT Mobile Project

People Directory

Campus Map

Shuttle Schedule

Events Calendar

Stellar

Emergency Information

3DOWN

http://mobi.mit.edu/

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Limitation of m-Learning Devices

- Small screen size and limited storage capabilities
- Batteries require regular charging
- Lack of common platform
- More easily lost or stolen
- Much less robust than desktops
- Get outdated very quickly
- Security and privacy issues
- Limited bandwidth problems
- Difficulties to upgrade
Tensions and Areas for Further Research

- Teaching vs. learning
- Walled garden vs. open arena
- Private learning vs. collaborative learning
- Digital native vs. digital immigrant
- Social networking vs. anti-social networking
- Rip-mix-burn vs. cut-tweak-paste
- Transitory marks vs. persistent marks
- Print literacy vs. digital literacy
- Serial processing vs. parallel processing
### Which tools does your institution currently use, and which do you think will be used within five years?

<table>
<thead>
<tr>
<th>Tool</th>
<th>Use now</th>
<th>Within five years</th>
<th>Don’t know/Not applicable</th>
</tr>
</thead>
<tbody>
<tr>
<td>Blogs</td>
<td>44</td>
<td>32</td>
<td>24</td>
</tr>
<tr>
<td>Wikis</td>
<td>41</td>
<td>30</td>
<td>29</td>
</tr>
<tr>
<td>Mashups</td>
<td>10</td>
<td>25</td>
<td>66</td>
</tr>
<tr>
<td>Video podcasts</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Online courses</td>
<td>53</td>
<td>71</td>
<td>14</td>
</tr>
<tr>
<td>Social networks</td>
<td>56</td>
<td>27</td>
<td>17</td>
</tr>
<tr>
<td>Text messaging/notifications</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Collaboration software</td>
<td>59</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td>Document management</td>
<td>59</td>
<td>26</td>
<td>15</td>
</tr>
<tr>
<td>RFID/sensor networks</td>
<td>17</td>
<td>30</td>
<td>53</td>
</tr>
<tr>
<td>Mobile broadband</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>Other, please specify</td>
<td>13</td>
<td>6</td>
<td>81</td>
</tr>
</tbody>
</table>
New Challenges

• **Quality** and **reliability** of information and resources

• Responsibility and awareness of **security** and **privacy** issues

• **Ethical** questions, e.g. [http://www.ratemyprofessors.com/](http://www.ratemyprofessors.com/), and cyberbullying

• Need for **new skills** both for learners and teachers
Economist Intelligent Unit 2008

In what ways do new technologies pose the greatest challenges and risks to colleges and universities? Select up to three.

(\% of respondents)

Potential increase in student plagiarism

51

Potential increase in student plagiarism
VeriGuide

- Similarity text detection system
- Developed at CUHK
- Promote and uphold academic honesty, integrity, and quality
- Support English, Traditional and Simplified Chinese
- Handle .doc, .txt, .pdf, .html, etc. file formats
- Generate detailed originality report including readability

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Call for Papers

Workshop on Social Computing in Education (WSCE2009)
in conjunction with SocialComp-09, August 29-31, 2009, Vancouver, Canada

- Theory and modeling of social computing in education
- Technology and software of social computing for education
- Social educational system design and architectures
- Case studies, best practices, and demos of social media in education
- Benchmark and experiments on social computing in education
- Mobile learning applications for social computing
- Semantic web standards for e-learning
- Software for social learning and collaborative learning
- Life long social learning network

- Quality and reliability of information and resources
- Privacy, risk and security issues in education using social media
- Virtual space for learning communities
- Ubiquitous, distributed, and collaborative learning
- Integration of social learning spaces
- Social computing in education trend analysis
- Web 2.0 and social computing for learning (media sharing, media manipulation, conversational arenas, online games, virtual worlds, social networking, blogging, social bookmarking, recommender systems, collaborative editing, wikis, syndication, etc.)
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• Haiqin Yang (Ph.D.)
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