Evaluation of Web 2.0 Tools in the e-Learning Context: Case Studies Related to Pedagogy and Usability

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Project goals  1/2

- Investigate potential uses of Web 2.0 tools in hybrid university courses
- Emphasis was on **usability** and potential for improvement of pedagogy (creativity, collaboration, peer-to-peer learning, etc.)
- Use of wiki and blog, as well as other Web 2.0 tools:
  - Mind-mapping & block-diagrams
  - Online notes taking
  - Online presentations / video podcasting, audio podcasting
  - Online comic strip creation
  - Social networking
  - Mashups, mockups / user-interface design
  - Online surveys
  - Social bookmarking

URL: http://e.foi.hr/iProjekt/index.php/Evaluated_Web_2.0_tools
Project goals 2/2

- More than 35 different Web 2.0 tools were included in several university courses in the 2009/2010 academic year.
- For 20 Web 2.0 tools a detailed *usability survey* was performed after their use by the students.
- Integration of artifacts produced by the students in wiki, blog, online community tools, e-portfolio, or Moodle LMS.
- Presentation of results on the project wiki, teacher training & workshops, case studies, conference presentations...
- Project team (Ana, Tihomir, Igor...):
  & Darko, Andreja, Norbert, Tonimir, Kreso...
E-learning 2.0 & teaching at university

- Newer trends in teaching and learning with the use of Web 2.0 tools (wikies, blogs, etc.; Downes, 2005)
- Pedagogical approaches like student-centeredness, learner autonomy, community of practice, learning community, collaborative learning (Gonzalez & St. Louis, 2008)
- Use of Web 2.0 tools can support higher-order thinking (Burns, 2009)
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![Positive effects on long-term memory](image)

E-learning 1.0 course (text, photos, tests, quizzes, self-assessment)

Creation of content for blog, wiki & other Web 2.0 tools (mind-maps, etc.)

N=51
Problems with the use of Web 2.0 tools

- Use of Web 2.0 tools can be time-consuming, distractive and confusing to students (Grosseck, 2009).
- Web 2.0 tools could suffer from technology and adoption problems (Torres Kompen et al., 2009).
- The adoption problems are related not only to students, but also to university teachers (Ajjana and Hartshorne, 2008).
- Developers of Web 2.0 tools may be disregarding good design practices regarding usability (Pilgrim, 2008).
- New pedagogical skills are needed by educators; copyright issues; privacy concerns and unwanted advertising/spamming; reliability of user-produced content and preservation of data in case of external service providers (Redecker et al. 2009).
- Our initial experiences indicated that the usability of various Web 2.0 tools for teaching at the university level should be investigated.
Project background 1/2

Hybrid course “Psychology and the Internet” (2004-2006) used wiki, blog, Delicious, Web CT & e-course
The Engwiki project (2007-) designed, used in a hybrid EFL course and evaluated more than 25 e-tivities with a wiki
Current example of a hybrid course

The hybrid course “Computer-Mediated Communication” (2008-2010) combines traditional lectures in the classroom with exercises in computer laboratory and the use of e-learning / Web 2.0 tools like Moodle, wiki, blog, e-portfolio, Delicious, Gliffy, bubbl.us, Slidestory, Veotag, Jotform, Google docs, Helipad, SpringNote, iGoogle, myYahoo, MockFlow, Mockingbird, etc.
The hybrid course “Computer-Mediated Communication” (2008-2010) combines traditional lectures in the classroom with exercises in computer laboratory and the use of e-learning / Web 2.0 tools like Moodle, wiki, blog, e-portfolio, Delicious, Gliffy, bubbl.us, Slidestory, Veotag, Jotform, Google docs, Helipad, SpringNote, iGoogle, myYahoo, MockFlow, Mockingbird, etc.
Positive effects of the use of Web 2.0 tools 1/2

- Very high average student evaluation of a blog tool (a component of Ning), mindmap (bubbl.us), and block diagram tool (Gliffy) regarding usefulness, interestingness, and ease of use (scale: 1 = very poor, 5 = very good; N=38; part-time students)
Positive effects of the use of Web 2.0 tools 2/2

- Very high average student evaluation of a blog tool (a component of Ning), mindmap (bubbl.us), and block diagram tool (Gliffy) regarding their potential to express personal creativity, positive influence on motivation for learning, and enrichment of educational experience (scale: 1 = very poor, 5 = very good; N=38; part-time students)
Usability study of Web 2.0 tools  1/2

- Academic course “Data Structures” in the winter semester of the academic year 2009/2010
- Students were given assignments which involved using diverse Web 2.0 tools to illustrate the content of the course and provide other students with instructions on how to better understand the course content
- A detailed breakdown of the course content was presented to students in a wiki system and students placed their Web 2.0 artifacts on wiki pages
- A comprehensive usability survey was developed for student evaluation of 20 Web 2.0 tools (usability attributes: Navigability, Ease of Use, Mental/Physical effort, Understandability, Learnability, Usefulness, Efficiency, System quality, Customizability, Controllability, Availability, Accessibility, Reliability/ Stability, Recoverability, etc.)
Usability study of Web 2.0 tools  2/2

- The Web 20 tools that were evaluated by the students:
  - Online presentations / video podcasting (Masher, Slidesix, Stupeflix, Yodio)
  - Mind mapping (Mind 42, Mindomo, Mindmeister, Wise Mapping)
  - Block diagrams (Draw Anywhere, Gliffy, Lucid Chart, Project Draw)
  - Online notes taking (iNetWord, Helipad, Google Docs, Zoho Notebook)
  - Collaborative programming / SNS (Posteet, Github, Bytemycodex, Pastebin)

- In groups of students Web 2.0 tools were used from each category to complete a specific assignment (solve a problem or explain a specific algorithm related to data structures)
The percentages refer to the number of students whose evaluation indicated a potential problem with a specific tool; N=158-171

<table>
<thead>
<tr>
<th>Usability attribute</th>
<th>Online notes taking</th>
<th>Block diagrams</th>
<th>Mind mapping</th>
<th>Video podcasting</th>
<th>Collaborative programming</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Navigability</strong> - User can quickly and easily locate all that is needed for performing a desired activity on a web tool.</td>
<td>20%</td>
<td>13%</td>
<td>7%</td>
<td>26%</td>
<td>19%</td>
</tr>
<tr>
<td><strong>Ease of use</strong> – Only minimal effort is needed for performing various activities with the web tool and control of the results.</td>
<td>19%</td>
<td>17%</td>
<td>8%</td>
<td>30%</td>
<td>15%</td>
</tr>
<tr>
<td><strong>Understandability</strong> – User can immediately notice the operations (options) that are provided by the web tool.</td>
<td>17%</td>
<td>12%</td>
<td>5%</td>
<td>20%</td>
<td>17%</td>
</tr>
<tr>
<td><strong>Reliability</strong> – There are no errors in the performance of the web tool (or they appear very rarely) and there are no interruptions while working with the web tool.</td>
<td>19%</td>
<td>15%</td>
<td>10%</td>
<td>28%</td>
<td>11%</td>
</tr>
</tbody>
</table>
Results of usability study  1/7

- Results of student evaluation of video podcasting tools *Masher* (N=167) and *SlideSix* (N=169) regarding navigability as a usability attribute. As many as 40% of the students who used Masher responded with “Disagree” or “Totally disagree” to the survey item “Navigability”, in comparison to only 16% of students who used SlideSix.
Results of usability study  2/7

Results of student evaluation of video podcasting tools *Masher* (N=167) and *SlideSix* (N=169) regarding reliability as a usability attribute. As many as 37% of the students who used *Masher* responded with “Disagree” or “Totally disagree” to the survey item “Reliability”, in comparison to only 21% of students who used *SlideSix*

**Percentage of responses to the survey item "Reliability – There are no errors in the performance of the web tool (or they appear very rarely) and there are no interruptions while working with the web tool."**
Results of usability study  3/7

- **SlideSix** is a Web 2.0 tool for creating online interactive presentations that can be recommended to university teachers, even though it manifests noticeable usability problems (better than *Masher, Stupeflix, Yodio*)

URL: http://slidesix.com
Results of usability study  4/7

- **Mindomo** is a Web 2.0 tool for making creative mental maps that can be recommended to university teachers (acceptable usability; also **Mindmeister**; both are better than **Mind 42 and Wise Mapping**)

*URL: http://www.mindomo.com*
Results of usability study 5/7

- **Mindomo** – an example of a mental map of a computer program (student work)
Results of usability study  6/7

- **Gliffy** is a Web 2.0 tool for making diagrams of any kind that can be recommended to university teachers (acceptable usability; better than *Draw Anywhere, Lucid Chart* and *Project Draw*)

URL: http://www.gliffy.com
Results of usability study  7/7

- **Google Docs** is a Web 2.0 tool for content sharing and collaboration that replaces desktop applications (word processor, spreadsheets, presentations, forms) and can be recommended to university teachers (acceptable usability; better than *iNetWord, Helipad* and *Zoho Notebook*)

URL: http://docs.google.com
Conclusion of usability study

- A comprehensive **usability survey** was developed for student evaluation of 20 Web 2.0 tools (*Navigability, Ease of Use, Mental/Physical effort, Understandability, Learnability, Usefulness, Efficiency, System quality, Customizability, Controllability, Availability, Accessibility, Reliability/ Stability, Recoverability, etc.*)

- After use in a hybrid course the following Web 2.0 tools were evaluated by the students and can be recommended to teachers:
  - Online presentations / video podcasting (*Masher, SlideSix, Stupeflix, Yodio*)
  - Mind mapping (*Mind 42, Mindomo, Mindmeister, Wise Mapping*)
  - Block diagrams (*Draw Anywhere, Gliffy, Lucid Chart, Project Draw*)
  - Online notes taking (*iNetWord, Helipad, Google Docs, Zoho Notebook*)

- **Usability study or detailed evaluation of a Web 2.0 tool should be performed before its extensive use in hybrid university courses.**

- Students should be provided with at least brief training in the use of chosen Web 2.0 tool(s)
Visualization of grammar & collaborative learning

- An addition to the Engwiki project in the winter semester of the 2009/2010 academic year

- A concept of collaborative language learning with online activities related to the visualization of the English grammar with the use of various Web 2.0 tools

- For mind-mapping we used Mindmeister and bubbl.us; for block-diagrams Gliffy was used; for video podcasting and video tagging the SlideSix and Veotag tools were chosen; while Bubblr was used for online comic strip creation from Flickr photos

- Students used mind mapping and block diagram tools to visualize grammar rules, SlideSix to provide explanation and Veotag and Bubbls (online comic strips) for creating examples/illustrations

- One case is briefly presented of *acronyms vs. abbreviations* topic (a mind map and block diagram)
Example of a mind map of grammar visualization
Example of a block diagram of a grammar related decision
Integration of students’ assignments in wiki, blog, online social community tool Ning, e-portfolio, and Moodle LMS

- **How to place the results of students’ work with Web 2.0 tools in one virtual space for peer-to-peer and collaborative learning?**

- The easiest way for students and the teacher is to use a **wiki** system (*MediaWiki*).

- The most attractive, integrating and motivating way is to use a **blog** tool (*WordPress*).

- Possibly, a good choice for small groups of part-time students who would like to socialize, cooperate and support each other would be a **social community tool** (*Ning* or *SocialGO*) with personal pages, members page, chat, forum, blog, upload of photos and video, events management, etc.

- When an **e-portfolio** system is present (perhaps integrated with LMS) the artifacts can be placed in the e-portfolio “View” (*Mahara*).

- A **wiki tool in Moodle** (with WYSIWYG editor) is an acceptable choice.
Best integration results: blog (WordPress)

Evaluation of Web 2.0 Tools in the e-Learning Context
Best integration results: e-portfolio view (Mahara)

Što je bitno za menadžersku komunikaciju - moje viđenje

Manager - "Komuniciranje u organizaciji"
- Profi za poslodavce i kolege
- Što je bitno za menadžersku komunikaciju - moje viđenje

Manager.hr - Novosti
Sve za menadžere
1. STUDENTI Novo u M.E.P.-u
2. RAD ZA SREĆU DRUGIH ILI - SVEĆENIČKI MARKETING
3. PRIROZNA IZVORE ZNANJA
5. ZDRAVI ŽIVOT U POGLOVNIOM SVIJETU
6. MIRNO TIKU RUBIKE
7. Goran Tudor - urednik
8. BIRANJEM ŽIVOTNIH OILJEVA - BIRAITE SREĆU!
9. STAROGRČKI TALES OD MILATA, UTEMELJITELJI FILOZOFIJE
10. TRIKOM PRAVILNE UREDNE PRIHRANE

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How to Conduct an Effective Meeting

Evaluation of Web 2.0 Tools in the e-Learning Context
Conclusion 1/2

- In the academic year 2009/2010 we have used the following types of Web 2.0 tools in several hybrid university courses (+ wiki, blog & e-portfolio).
  - Online notes taking (*iNetWord*, *Helipad*, *Google Docs*, *Springnote*, *Zoho Notebook*)
  - Mind-mapping (*bubbl.us*, *Mind 42*, *Mindomo*, *Minmeister*, *Wise Mapping*)
  - Block-diagrams (*Draw Anywhere*, *Gliffy*, *Lucid Chart*, *Project Draw*)
  - Online presentations / video podcasting (*Masher*, *Slidesix*, *Slidestory*, *Stupeflix*, *Veotag*, *Yodio*)
  - Audio podcasting (*Podomatic*, *Woices*)
  - Collaborative programming / SNS (*Posteet*, *Github*, *Bytemycode*, *Pastebin*)
  - Online comic strip creation (*Bubblr*)
  - Mashups (*iGoogle*, *My Yahoo!*, *Pageflakes*)
  - Mockups / user-interface design (*MockFlow*, *Mockingbird*)
  - Social bookmarking (*Delicious*)
  - Online surveys (*JotForm*)
  - Social networking (*Ning*, *SocialGO*)
Conclusion 2/2

- **Pedagogical aspects**
  - Utilization of diverse Web 2.0 tools for different collaborative and peer-to-peer learning scenarios, facilitation of creativity, investigation of effects.
  - Novel approaches to teaching university courses “Computer-Mediated Communication”, “Data Structures” (programming), and “English Language” (as a foreign/second language)

- **Technological aspects**
  - Usability evaluation of Web 2.0 tools (detailed for 20 tools + comprehensive evaluation survey)
  - Integration of students’ Web 2.0 artifacts is possible with wiki, blog, e-portfolio, and online community tools (Ning)

- **Potential use**
  - Best performing Web 2.0 tools regarding usefulness and usability will be identified
  - Scenarios and case studies for effective use of Web 2.0 tools will be presented on the project wiki
  - Workshops, lectures and conference presentations (3W, 3L, 3P so far).

**Link** URL: http://e.foi.hr/iProjekt
Thank you for your attention!

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