Developing Learning Platform with Web 2.0 Features to Promote Web-based Collaborative Learning Performance

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Agenda

- Introduction
- Web 2.0 Concepts
- Benefits of Learning with the Support of Web 2.0 based Learning Platforms
- The Developed Learning Platforms with Web 2.0 Features for E-learning Master Program of NCCU
  - PasteWall Community Platform
  - Collaborative Problem-based Learning System
  - Collaborative Reading Annotation System
- Q & A
Providing interaction has always been an important issue in distance education.

For quality of learning, satisfaction of students and effective learning outcomes, it is necessary to provide different interaction forms for student-student, student-teacher, and student-content.

Web 2.0 technologies are changing pedagogies and bringing out the necessity for

- more effective two way communication,
- promoting interaction and collaboration,
- sharing and flexible participation.
Education must be not only socially but collaboratively constructed. Namely, learners always expect to collaborate with their peers.

Web 2.0 technologies open the doors to collaboration and participation. It encourages and facilitates the natural desire to share what you know and to learn from your colleagues.
Web 2.0 Concepts

Web 2.0 is a loosely defined intersection of web application features that facilitate participatory information sharing, interoperability, user-centered design, and collaboration on the World Wide Web.

The concept of Web-as-participation-platform captures many of these characteristics.
Web 2.0 Features

- Two way communication
- User generated content
- Openness
- Easy sharing
- Writing comment and feedback
- Rich design
- RSS feeding
- Collective Intelligence
Principles of Web 1.0 and Web 2.0

**Principles of Web 1.0**
- Reading
- Receiving
- Researching

**Principles of Web 2.0**
- Contributing
- Collaborating
- Creating
Web 1.0 (1993-2003)
Pretty Much HTML pages viewed through a browser
- "Read"
- "Page"
- "static"
- Web browser
- "Client Server"
- Web Coders
- "geeks"

Web 2.0 (2003-beyond)
Web Pages, plus a lot of other "content" shared over the web, with more interactivity; more like an application
- "Write"
- "Post / Record"
- "dynamic"
- Browsers, RSS Reader
- "Web Services"
- Everyone
- "mass amateurization"
1. Wiki Publishing (Wikis)
2. Webblog Publishing (Blogs)
3. Social bookmarking (inspired the social news movement)
4. RSS Feeds, NewsReader
5. Photo Sharing
6. Podcasts
7. Videocasts
8. Gaming
8. Google Docs & Spreadsheets (Writely) / Microsoft Office Live
9. The Long Tail
10. Web Services / Online Retailers (Amazon, iTunes)
11. Online Auction, Shopping Mall & E-commerce (eBay)
12. Internet Telephony / VOIP (Skype)
13. Virtual Reference / Online Reference
14. Streaming Media Tutorials
15. with Interactive Databases
The Impacts of Web 2.0 Technologies on Education

- Learners have powerful tools for learning
- Learners create/add/adapt learning content
- Personal learning environments
- Power shift from teachers to learners
- Open access, content, services
- Social networks; peer-to-peer (P2P)
- More others?
Developing PasteWall Community Platform for Supporting Effective Idea Sharing and Discussion
Learning Scenario for Knowledge Construction based on Idea Sharing and Discussion

1. How to organize midterm group report?

2. There are a lot of software that can aid us to organize thoughts.

3. However, how to effectively share information and proceed discussion?

4. Using email easily leads to flood information.

5. Information is not easily managed if using community platform for group discussion.

6. Also, there is almost no personal privacy in social community platform.
We need a more powerful learning platform which simultaneously contains the functionalities of community interaction and knowledge management.
But, how to do?

We tried to find out this possibility which has not still been replaced by computers from our daily lives.
Yes, we found it!!

Sticky notes
Why Have Sticky Notes Not Still Been Replaced by Computers?

Quick Note (note-taking APPs)

- Personal Database
  - Evernote
- Micro-blog
  - Plurk/Facebook

Knowledge Management (database and mind map)

Online Cooperation Platform
- Google Doc

Community Interaction (social platform)
Using legal registered ID or Email to login the PasteWall system based on https security design
Writing down your thoughts and selecting the corresponding type of tag to paste your virtual sticky note then click “Paste” button to paste your sticky note on private or public wall.
Sharing Hyperlinks and Multimedia Gathered from the Internet

Pastewall can paste various types of contents including text, Youtube video, picture, and hyperlink. Each virtual sticky note pasted can be revised by editing interface.
Enlarging the Picture for Watching Details

Enlarging video or picture for watching details
Replying and Promoting Your Favorite Virtual Sticky Notes

Replying notes that your feel interest

Write down your responses to some note

Promoting note that you prefer
Browsing the walls of your friends, promising invitations from your friends or inviting someone as your good friend who has willingness to share his/her private wall with you.
Browsing Historical Notes based on Time Management Interface

Users can utilize the time management interface to browse historical notes belonging to different periods.
The Developing Scenario of the PasteWall

Web 2.0

Data → Information

Social Network update

Web 3.0

Information → Knowledge

Social Network building

Tim Berners-Lee (2010)
Developing Collaborative Problem-based Learning Platform with Facilitating Community Interaction Mechanism
Background

- Considering the notion of Dewey’s social aspects of learning, Heo, Lim and Kim’s study (2010) indicated that learners are likely to achieve better learning outcomes from PBL in collaborative contexts.

- Moreover, to increase communication and collaboration opportunities, members of a learning group must be aware of the social networks that exist within that learning group (Cadima et al., 2010).

- Cadima et al. (2010) argued that the visualization of the social networks, given as feedback, could obtain a positive impact on augmenting learners’ social network awareness in a learning group.
Motivations

- Incorporating a social network analysis to offer better understanding of the structural pattern of online interaction in PBL.

- In Web-based cooperative PBL learning environments, peer-to-peer interaction often suffers from the difficulty due to lack of exploring useful social interaction information, so that peers cannot find appropriate learning partners to make an effective cooperative learning.

- Presenting a novel scheme of mining social interactive networks for promoting social awareness of learners and recommending appropriate learning partners for individual learners in a cooperative problem-based learning environment.
Designing a teaching plan of integrating information technology into instruction based on the proposed problem-based learning procedures
Reflective Action for Web Problem-Solving Learning

Cognition-action-reflection mental processes for problem-solving learning
The Teacher Interface for Designing Learning Scaffolding

Design learning scaffolding for learners
Message Center for Supporting Interaction with Peers

Sending messages to seek peer’s assistance
The Learner Interface for Displaying Current Learning Status

Displaying current learner’s learning stage in PBL
An Example of Learning Social Networks in PBL

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The in-degree and out-degree interaction values represent the degrees of popularity and initiative, respectively, of learners in the cooperative PBL environment. The bidirectional interaction represents the active degree of a learner in the cooperative PBL environment.
### Display each learner’s interaction status with peers

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Social Position Presentation for Encouraging Interaction with Peers

Top three learners with highest social position
The detailed social interaction relationships of number 72 learner.
Learning Partner Recommendation for Individual Learner

Learning partner recommendation for individual learner

Out_Degree: 6
In_Degree: 3
互動值: 4
互動空間: 1
互動分數: 15
社會排名: 15

得分: 0.829571426571429

得分: 0.804761904761905

得分: 0.747619047619048
Identifying Learning Roles based on In-Out Interaction Degree

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Identifying learning role for teacher
Identifying Learning Roles based on In-Out Interaction Degree and Message Types

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Identifying learning role for teacher
Group Formation based on Learning Roles Identified for Collaborative PBL

Group formation for collaborative PBL
The finished teaching plan of the first PBL stage

一、問題說明

您覺得「資訊融入教學」是什麼？請用你自己的話或想法為它定義。

答：我對資訊融入教學的定義是，在教學過程中使用資訊科技輔助教師的教學及學生的學習，以提升學習者們的學習動機及學習成效，而達到教學目標。教學過程中使用到的資訊科技，包括教師的課程教學設計，教學過程中，學生學習過程，乃至教學評量部分等，都彈性使用到資訊科技做為輔助教師教學與學生學習的工具。

二、廣泛思考

您認為一份良好的資訊融入教學設計應該注意哪些因素，才能在教學中發揮其應有的效果。

答：一份良好的資訊融入教學設計必須考量幾個因素。

• 首先是教師必須具備應用資訊科技的基本能力，包括資訊設備的使用，使學生可有效應用資訊設備，教師可利用網路搜尋課程教學內容，並利用網路搜尋相關資訊，做為教學的輔助媒體。
• 其次是教學現場的資訊設備要充足，例如使用到的筆電、投影機、電腦、電子白板、按鈕按教學輔助設備等，以及建置或使用現有的教學平台作為輔助教學的學習平台。
• 再來是課程的教學設計生產必須以學習理論為依據，融入使用現有的資訊科技數位設備及教學媒體，以提升學習者的學習動機及學習成效。
• 最後是學習者的學習工具，學習者能使用學習載具如PC或平板電腦等，使用資訊科技設備查詢資料解決問題，或是合作學習討論等。
The finished teaching plan of the second PBL stage

一、了解問題

★說明：學生角色扮演企業作為企業家，在學過程中累積知識的過程，邀請專家本題的解答，面對九年一貫制重大議題如環境、資源、生態系的搶救、人口問題等環境課題。在專家的指導下，學員在預設的情景中，提出問題，並進行問題解決方案的設計，最後提出問題解決方案的反應，並對學生進行反思。本教學活用設計是以「提出問題提出方案」為核心，促進學生進行思考，以提高學生的思維和解決問題的能力。

二、相關資料

★我所使用的教材有：

- 素材一：
  - 名稱：國民教育科圍繞India
  - 用途：國民小學九年一貫課程(英文)內容之一範圍，進行課程設計之依據，其中重大議題之一：環境課題，與本單元主題息息相關。
  - 來源：http://www.tse.edu.tw/index.php

- 素材二：
The finished teaching plan of the third PBL stage

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<td>我們居住的地球正處於氣候暖化、臭氧層破洞、溫室效應及環境污染等問題，我們的生活環境之改變，是由於人類過度的使用能源，失去了原有的平衡，才造成「全球暖化」並導致「氣候變遷」。本教學活動設計之主題為「搶救地球大作戰」，透過解決一系列的問題活動，透過問題解決活動（Problem-based learning），讓學生進行小組討論合作學習，以解決真實世界的環境問題。透過網路、節目、書籍等專家著作、PPT介紹，帶領學生認識地球正處於的環境問題，進而學習如何在日常生活中採取實際的行動及環境保護，提升學生研究及解決問題的能力。</td>
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The finished teaching plan of the third PBL stage

<table>
<thead>
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<th>一、發展活動 (85 分鐘)</th>
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<td>1. 教育透過「全來二氧化碳減量一起來」簡報，介紹日常生活中節能減碳的作法。</td>
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<td>2. 參觀校內關於節能減碳等相關設備資源，如太陽能發電、風力發電、水電等。</td>
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<td>1. 未來遇到問題時，能採取主動探究、研討對策的決策模式。</td>
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<tr>
<td>2. 能認識並了解節能減碳的目的及作法。</td>
</tr>
<tr>
<td>3. 能養成生活中節能減碳的好習慣。</td>
</tr>
<tr>
<td>4. 能利用網路搜尋相關資訊補充觀察不足之處及查驗自己的推測。</td>
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The finished teaching plan of the third PBL stage
Developing Collaborative Reading Annotation System for Supporting Effective E-reading
Motivation

- Reading annotation belongs to explicit reading behavior, which contains reader’s reading knowledge and skills
- A digital article with different reading annotations provides benefits in terms of promoting critical thinking and knowledge debate
- The developed collaborative reading annotation system provides benefits in terms of accumulating and sharing knowledge of readers who cooperatively participate in reading or learning processes on digital article
- The digital article with semantic annotation can help new readers to understand the article more efficiently as well as help readers who had read this article to obtain deeper and broader knowledge
- The annotated information comes from collective intelligence of different readers, thus having very high potential on exploring value-added reading knowledge via data mining techniques
The Developed Collaborative Reading Annotation System

- Writing and managing reading annotations
- Browsing reading annotations contributed by others
- Replying and arguing reading annotations contributed by others
- Gathering favorite reading annotations
- Automatically suggesting reading annotation skills
- Automatically recommending high quality reading annotations
- Exploring reading annotation experts (current work)
Selecting Reading Annotation Range

Case study examples of MediaWiki in teaching and learning

Introduction

Internet based Wikis provide a ubiquitous way for teaching and learning, content to be created, managed, and distributed. Content can be created by a lead person (such as a Lecturer), and can be added to, and amended by both the creator and learners based on their research or own knowledge.

MediaWiki is the software used by Wikipedia, the largest encyclopedia in existence (Gabrilovich & Markovitch, 2007), and has been adopted by two significant collaborative Learning content repositories: WikiEducator (http://www.wikieducator.org) and WikiVersity (http://www.wikiversity.org).

For the research being conducted, the overall research question is “Can a wiki be used to effectively deliver content in a blended learning environment?” This is part of a major action research project spanning many years, and this cycle considers the use of wikis as a delivery tool in the virtualMIE framework. For more details, please refer to Verhaart (2008, 2009).

From an educator’s perspective, are there examples of how Wikis can be used to facilitate both teaching and learning, and what technology is required to allow the content to be presented? The overall purpose of this paper is to generate interest in sourcing good exemplars that will form a guide for those wishing to use wikis for learning.

MediaWiki in Teaching and Learning

In order to investigate how wikis (and in particular MediaWiki) can be applied, MediaWiki has been used in a blended teaching and learning environment. So as not to be constrained by the limitations of existing systems (such as WikiEducator & WikiVersity), a MediaWiki has been privately hosted at http://www.virtualnow.com/wiki. This allows for research into what additions could be added enhancing learning based content.

In a blended learning situation, multiple pedagogies can be employed. At the 2010 DEANZ Conference, in Wellington, New Zealand, Terry Anderson described three generations of distance education pedagogy. These included: behaviourist/cognitive, constructivist, and connectivist. (Anderson, 2010), where: behaviourist/cognitive includes, self-paced and individual study (and in a blended environment instructor, constructivist, working in groups, and connectivist, using networks and collectives. For a blended environment, multiple strategies are used to engage students, with different pedagogies suiting different situations. Therefore, in order to be useful in a blended teaching and learning environment ideally multiple pedagogies should be supported.

Content presentation and technology support for learning

Developing learning content and materials in MediaWiki has two lenses: the first involves the way in which the content is to be delivered to learners, and the second what technology is required. The MediaWiki case study being explored centres on content in the Multimedia, and Internet domains for undergraduate students. At this stage, several learning paradigms have been prototyped and used in teaching situations and include:
Setting Reading Annotation as Public or Private State
Increasing a Reading Annotation based on a Reading Annotation Type Selected

Case study examples of MediaWiki in teaching and learning

Introduction

Internet-based Wikis provide a highly flexible way for teaching and learning, both the creator and learner can contribute to the knowledge base. While the concept of a wiki is quite simple, it is also highly powerful. It can be used for a variety of purposes, from a simple collaborative writing tool to a complete learning management system. MediaWiki is the software used for this purpose.

For the research being conducted, the KALS system was selected, and this cycle considers the related research major. From an educator's perspective, the paper is to generate interest in the teaching and learning of the system.

Content presentation and technology support for learning

Developing learning content and materials in MediaWiki has two lenses. The first involves the way in which the content is to be delivered to learners, and the second what technology is required. The MediaWiki case study being explored centres on content in the Multimedia, and Internet domains for undergraduate students. At this stage, several learning paradigms have been prototyped and used in teaching situations and include:
Amending or Deleting an Existed Reading Annotation

In order to facilitate these situations, MediaWiki has been extended. From the case study five.

1. Adding JavaScript that would be loaded with every page.
2. Developing Templates that would automate functionality such as providing pedagogical
3. Adding full (PHP) extensions to MediaWiki.
4. Adding Widget extensions to Media Wiki.
5. Using tools external to MediaWiki, such as "Mind Framework".

Wiki grids

Two wiki grids have been constructed to help the research wiki (virtualWiki), though it is not an excerpt from the grid is shown in Table 1.
Replying, Arguing or Rating Reading Annotations Contributed by Others
Arguing Reading Annotations Contributed by Others

Internet based Wikis provide a ubiquitous way for teaching and learning content to be created, managed, and distributed. Content can be created by a lead person (such as a Lecturer), and can be added to, and amended by both the creator and learners based on their research or prior knowledge.

In a blended learning situation, content may be constrained by the limitations of existing systems, and the need for enhanced learning based content. In the context of Edu, collaborative learning and creative conditions are key. These may include environment, instruction, constructivist, working in different situations. Therefore, in order to be useful in a blended learning situation, content should be reusable, and may be edited, added, and amended by both the creator and learners based on their research or prior knowledge.

Developing learning content and materials in MediaWiki have becomes a common practice. The key to the success of this approach is the ability to be edited, added, and amended by both the creator and learners based on their research or prior knowledge.
Setting Configuration for Recommending High Quality Reading Annotations
Automatically Suggesting Reading Annotation Skills and High Quality Reading Annotations
Using Wiki to Co-editing Reading Report After Performing Collaborative Reading Annotation Learning Activity
Wikis in Educational Context

- Support collaborative learning and writing
- Support project based and inquiry based learning
- Promote creativity
- Encourage critical searching
- Provide easy online updating content
第4章 Web-based workspace: supporting student teams in Usability engineering Course***

1. 請用簡報方式說明這篇文章的結構？

2. 這篇文章所提合作學習方法的特點為何？

3. 請你建議這篇文章合作學習方法是否有效？

4. 你是否認為這篇文章合作學習方法的有效性？

學生對於workspace的使用很有足夠的知識和能力進行有效合作。
Browsing Co-editing Processes
Thanks for Your Listening!!