

PBL

Problem-Based Learning & the Internet

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Scenario for a real-life problem

The local senior citizen center surveyed its members to determine their wants and needs

At the top of the list: **their desire to learn more about their computers and the Internet**

Angela Cranberry, the director of the center, has approached your class for help. She wants you to find out more specifics about their computer needs, then devise some solutions



The problem's problems

- The teacher must design a PBL unit to bring the problem to the class
- The problem must be broken into smaller sequential steps
- The problem must be divided amongst the class
- The solution must be more than hypothetical; it must be carried out
- Assessment of student and senior learning must be included

The problem's solutions

1. The teacher must design a PBL unit to bring the problem to his class
 - Attend Classroom Connect conferences
 - Read about PBL's theory and process on the Internet
 - Synthesize what is learned into one's own personal PBL lesson

The problem's solutions

2. The problem needs broken into smaller sequential steps
 - Survey seniors regarding their specific technical needs
 - Survey students regarding 1) What they feel seniors need to know; 2) What they are able to teach
 - Organize a training program
 - Gather the resources and build the lessons
 - Provide follow-up for evaluation and continued support

The problem's solutions

3. The problem needs to be divided amongst the class
- Six groups do the top Six training topics
 - Assign individual responsibilities to group
 - Require spotter groups to assist and observe
 - Who goes first, next, last?

The problem's solutions

4. The solution must be more than hypothetical; it must be carried out
- Study the student population; what is unique to seniors?
 - Establish communication with senior center co-organizers
 - Develop a schedule: arrange dates and secure labs
5. Provide a rubric, a survey, a discussion, an email address for follow-up and assessment

The Student and Senior Lists

Six Top Student-determined needs

- Troubleshooting & maintenance
- Email and email attachments
- Searching & bookmarking the Internet
- Scanning and printing
- File management
- Security

Six Top Senior-determined needs

- Communicating with family (email & instant chat)
- Working with pictures (scanning, printing, file mgt, viewing, resizing)
- Keeping up with news, sports, weather, and stocks (searching)
- Getting rid of spam & pop-ups (security)
- Fixing problems (troubleshooting)
- Ongoing support (searching, email, follow-up communication)

Definition and Analysis of PBL

- What is PBL?
- What are its benefits?
- What are its detriments?
- What is the process?
- What are some sample problem types?
- How can the process be tied to the Internet?

What is PBL?

Problem-based learning poses real-world situations in context and provides resources and guidance for acquiring knowledge while improving problem-solving skills. (Mayo, Donnelly, Nash, & Schwartz, 1993)

Unlike traditional instruction that too frequently assigns fact accumulation on a topic and stops, PBL requires students to process those facts and contribute their own ideas toward a solution.

Some of PBL's benefits

- It allows for creativity, critical thinking, and self-direction
- It allows more than one right answer
- It fosters group collaboration
- It makes room for classroom diversity and cultural differences
- It cuts down on lecture & data shoveling
- It has a sense of discovery and newness
- Students must dig deeper into the WHY of things

Some of PBL's benefits

- PBL deals with controversy as well as with facts. The learning is more important than the final product
- It deals with real-life issues
- It teaches life-long learning skills
- It helps students understand the relevance of their studies
- It is student centered
- It is interdisciplinary
- It is multi-modal: reading, writing, listening, speaking
- It teaches students to fish



Some of PBL's detriments

- Students sometimes don't learn as much factual information
- Standardized test scores could drop in a PBL environment
- Students are not accustomed to this form of teaching
- Teachers are not accustomed to this form of teaching
- It takes longer to teach the material
- Faculty has no extrinsic incentive to change, work harder, and take longer to teach their material
- Schools often lack a resident PBL expert teacher
- PBL expert teachers have less time to donate to staff development

PBL process

- Determine the structure
 - One problem for the whole class?
 - One problem with the class in groups?
 - Will groups focus on different aspects of the same problem, or have different problems?
 - Will groups compete or collaborate?
 - How will information be shared between groups? How often?
 - What are the individual responsibilities?
 - Will you role play?
 - What is the final product?
 - What is the role of technology?
 - Which Internet resources will be provided, which must be found by students? Other resources?

PBL Process

- Maintain control while granting independence by creating a solid rubric!
<http://rubistar.4teachers.org/>

PBL Process

Develop the problem (s)

- | | |
|---------------|---------------|
| 1. Relevancy | 1. Goals |
| 2. Coverage | 2. Objectives |
| 3. Complexity | 3. Benchmarks |

Will the problem actually be solved, or is it hypothetical? Is the problem information rich or skill rich? Is it controversial?

Sample Complex Problems

- How does America improve its image in the Middle East?
- How do we reduce pollution in our oceans? Air? Food?
- How do we prepare for running out of oil?
- How do we stop students from dropping out of school?
- How does our country, state, school get out of debt?

Sample Problems with role-playing

- Your class is stranded on a deserted island for one year. What are your rules for survival?
- You must pick 10 professionals for an expedition to a new planet. Who will go?
- You must pick a dozen items that represent the best of humankind to be launched into space in a time-capsule. What will you choose?
- You are on a committee to stop Internet theft of music and movies. What will you do?

Sample problems that can be solved

- Campus litter is out of hand
- Not enough parents come to open house
- The school bathrooms are being trashed/neglected
- Traffic around the school is dangerous
- Student parking is insufficient
- Students want classes that don't exist
- Students need more tolerance of diversity

Sample problems that are content rich

- You are on a committee to determine if we should drop the first atomic bomb
- You must invite the 10 most influential people in history to a dinner party
- You must explain the human body to visiting aliens
- You must turn Strunk and White's Elements of Style into a play
- Teach anything

Sample problems that are skill rich

- Form online writing circles and email essays or stories between members to review and return
- Create a bridge out of a limited number of toothpicks that can withstand a specific amount of weight
- Write a new alma mater in iambic pentameter
- Fix a broken computer, car, bicycle
- Plant a garden

Problems rich in controversy

- Take your pick: abortion, gay rights, racial prejudice, age discrimination, globalization, trade tariffs and embargos, emigration laws, assisted suicide
 - Focus on tolerance and diversity more than on finding solutions

PBL & The Internet

- PBL has been around forever. It was formally coined and curricularized (sic) in the early 1950s
- Integrating technology into PBL methodology is the challenge before us



Ideas for integrating Internet

- Create portals on PBL urls
- Create portals on content urls
- Cut and paste and ©opyright
- Advanced search techniques
- Various search engines
- Digital final project – PowerPoint, Webpage, spreadsheets
- Project technical elements – multimedia, hyperlinking, special effects

Find all these links LIVE online at www.mrgibbs.com/cc/seattle

- SDSU PBL WebQuest (1998)
 - http://edweb.sdsu.edu/clrit/PBL_WebQuest.html
- PBLI (last updated 2000; similar content to SDSU)
 - <http://www.pbli.org/core.htm>
- PBL Clearinghouse (must join free)
 - <https://www.mis4.udel.edu/Pbl/index.jsp>
- Assessment rubric
 - <http://www.idecorp.com/assessrubric.pdf>
- A Sample PBL UBUYACAR project
 - http://www.mcli.dist.maricopa.edu/pbl/ubuystudent/ubuyacar_student.pdf
- Merlot
 - <http://www.merlot.org>
- Trackstar
 - <http://trackstar.hprtec.org/>
- Model Problems
 - <http://www.imsa.edu/team/cpbl/whatis/model.html>
- CIA World Factbook
 - <http://www.cia.gov/cia/publications/factbook/>
- Encyclopedia
 - <http://www.encyclopedia.com/>
- Daily Earth
 - <http://dailyearth.com/>
- eHow
 - <http://www.ehow.com>
- Big Engine
 - <http://www.search-engine-index.co.uk/>
- 50 States
 - <http://www.50states.com/>
- WhoIs
 - <http://www.whois.net/>
- Feedroom
 - <http://www.feedroom.com>
- News Directory
 - <http://www.newsdirectory.com>
- Various Search Engines & other educational resources
 - www.mrgibbs.com
- Opinion Power
 - <http://www.opinionpower.com/>
- Yahoo! briefcase
 - <http://briefcase.yahoo.com>
- Landmark Project's SLATE discussion boards
 - <http://www.landmark-project.com>