Enquiry-Based Learning with Pictures (The Geograph Project)

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CBLIS 2010, 6th July, Warsaw

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Overview

• Rationale
• Pictorial Communication
• Pictorial Pedagogy
• Resources
• Case Study
1. Rationale

- Mental Tranquillity
- Curiosity
- Observation
- Problem Solving
Mental Tranquillity

Sea of mental tranquillity (meditation?)

Low cognitive activity

High cognitive activity
Types of Cognitive Activity

Conscious thought

Latent thought

Dormant thought

Note: the ‘learning spirals’ model
Model of Human Activity

Thoughts

Observe

Curiosity

Amplified by technology

Resources

Research Processes

Knowledge Synthesis

Experiments


Experiments

Achieving Mental Tranquillity

Much of human activity is associated with the motivation associated with ‘want to know’ or ‘want to do’ something.

Successful learning causes the learning spirals to quiesce thereby causing cognitive activity to achieve a temporary level of mental tranquillity.

However, human activity is driven by goal seeking and problem solving processes.

So, mental tranquillity is only a hypothetical state that can never really be achieved other than in a transient moment.
Problem Solving

- Critical and Creative Thought
- Mental Models
- Experiences and Study
- Develop Skills
- Manage Knowledge (Personal Electronic Archives)
- Problem Solving
Navigating a Problem Space

Problem-Solving Space

Unsolved Problem → Solved Problem

Examples

1. Repairing an electric fire
2. Felling a tree
3. Flying an aeroplane
4. Playing a game
2. Pictorial Communication

- Capturing Pictures
- Optimality and Augmentation
- Types of Picture
- Using Maps
Capturing Pictures

External Visual Scenes

Automated Techniques

TOOLS

Mental Scenes and Visualisations

Manual Techniques

Picture Representation on External Media
Optimality and Augmentation

- Pedagogy
- Special Effects
- Descriptive narrative
- Transcript (Braille or Audio)
- Title
- Keywords
- Links
Types of Picture

Time invariant discrete picture

Time variant discrete reactive picture (P is a perturbation and R is a reaction)

Event-related pictures

Time-related pictures
Using Maps

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Licence No: 100046831.
Augmentation (1): Lines and Symbols

Base Map
Augmentation (2): Lines and Text

Height Profile with Names of Peaks
Augmentation (3): Text and Colour

From the church in the centre of the town we set off along the road in an easterly direction to reach the Youth Hostel (SE 615 840). We maintained our easterly bearing to the gated field-entrance at (SE 620 840). Now changing to a north-easterly bearing, we made our way through Reagarth Farm (SE 627 845) to reach the western edge of Riccal Dale (SE 630 846). Turning left, we now followed the field boundary fence in a northerly direction along the edge of the woods to reach Rea Garth Farm (SE 625 857) - see the picture below.

![Image of Rea Garth Farm]

We continued along the track that runs along the edge of Riccal Dale Wood for about 500 yards until we found a path on our right at (SE 622 861). Taking this path, we made a steep descent in a south-easterly direction through the woods to the footbridge over the River Riccal at (SE 627 859).
3. Picture Pedagogy

• Definition

• Generic Approaches

• Example 1

• Example 2
Definition

Pictorial pedagogy is concerned with the study of various forms of picture and the ways in which they can be used to stimulate and enhance learning processes.

This involves identifying learning tasks in which images can be used with beneficial effects.

Image augmentation can also be used to enhance and extend learning experiences.
Generic Approaches to Pedagogy

- Require an individual or a group of people to identify and discuss the objects in a picture.
- Ask an individual or a group of people to compare two images for similarities and differences.
- Ask an individual or a group of people to find images containing particular artefacts.
- Find a collection of images to reflect a particular theme such as churches, bridges, rivers, and so on.
- Find an image to illustrate a particular point in a written report or essay.
- Prepare a PowerPoint presentation for a talk on a particular topic.
- Find images that support a particular argument.
- Find images that refute a particular argument.
Example 1

‘I have uploaded an image to the digital object repository for the course. Its accession number is XXXXXX. Could you please have a look at this image and discuss the major issues that are implicit within it. What conclusions can you draw and what action would you take (both as individuals and as a group) in order to remedy the situation depicted in the picture?’
Example 2

‘Examine the three pictures: A, B and C. What characteristics do they have in common? What are the essential differences between them? Use the annotation button underneath each picture in order to add a short textual narrative that would help someone to understand what is happening in each of these images. Your annotation should include a Web link to a relevant Internet site that gives more information relating to the issues portrayed in the three pictures that you have examined.’
4. Resources

- Picture Collections
- Indexing and Retrieving
- Metadata
- Digital Object Repositories
- Examples
Picture Collections

Image Creation

Acquisition Process

Image Archive

Retrieval/Sharing

- Private and public collections
- Image sharing sites
- *Flickr* and *YouTube*

Subset of the stored images
Indexing and Retrieval

Augmentation

New Image

Image Repository

Attributes & Accession Number

Database

 Retrieval Engine

Required Images
Metadata for Pictures

<image-collection-metadata>

Image Collection

<title>

Image Objects

<rights>

<properties>

<owner>

<dates>

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<pedagogy>

<description>

<discussions>

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Pictorial Information System

Utility Software

Management Infrastructure

Digital Object Repository for Images

End-user Interface

Image Upload

Image Retrieval

Online Forums

Tools
Support Tools for Pictorial Pedagogy

Google Earth

MAGIC

Geograph

World Knowledge

User-Population

Interactive Systems Research Group
5. Case Study

- The Geograph Project
- Information Architecture
- Uploading Images
- Retrieving Images
Geograph Overview

- Web address: http://www.geograph.org.uk
- Described in Wikipedia
- Project began in 2005
- Almost 10,000 registered users (upload capability)
- Almost 2,000,000 stored images
- Built-in ‘gaming’ element
- Pictures moderated by a team of moderators
- Three types of picture: geograph, supplemental and reject
- Points allocated according to rules
- Groups of retrieved images are called ‘collections’
Information Architecture

Notional grid-squares map onto UK and Ireland land topography

Pictures are clustered by grid-square

NZ3142 (1 km x 1 km)
SE37 - hectad (10 x 10)
SD - myriad (100 x 100)
Uploading an image ...

Enter grid reference (e.g. SY9580) **NY6950** Show >
or
Choose grid reference NY ▼ E 69 ▼ N 50 ▼ Show >
near to Ayle, Northumberland, Great Britain
- We have 5 images for NY6950
- See geographical distribution of pictures
- View all images: slideshow, thumbnails
- Submit your own picture
- Start a discussion about NY6950
- Geograph Coverage map

Search local images:
Keywords: □ □ □ Search
① In NY6950 only / ② inc surrounding squares

More Links for NY6950 or NY65
Images in NY6950 Breakdown list
We have 5 images for NY6950

Course of former railway approaching Kirkhaugh
Old mine building
Sheep on the road near Low Row
Submit Step 2 of 4: Upload photo for NY6950

We currently have 5 images uploaded for NY6950, add yours now!

JPEG Image File: C:Documents and Settings Browse...
If your image is over 640 pixels in either direction, you will be offered chance to upload the largest version.
If you have presized to 640px please aim to have the file size under 100kb and in any case under 200kb, thanks!

Copy from Last Submission
New
OS Get-a-map™

Primary Photo Subject: NY69185039

Photographer Position: NY69280 50270

Copy from Subject
range about 155 metres

☑ Only display 6 figure grid reference (Explanation)

View Direction (photographer facing)
Northwest : 315 deg (303 > 326)

1:50,000 Modern Day Landranger™ Map

Switch to Historic Map.

Centre the blue circle on the subject and mark the photographer position with the black circle. The circle centre marks the spot. The red arrow will then show view direction.
Title and Comments

Please provide a short title for the image, and any other comments about where it was taken or other interesting geographical information. (Open Style Guide)

Title
Ladder stile near Lintley

Gazetteer info as will appear:
near to Slaggyford, Northumberland, Great Britain

Description/Comment
This photograph shows a view of one of the many ladder stiles on the Pennine Way. Wardley Law can be seen in the background of the image. The picture was taken looking in a northerly direction towards The Dimples.

TIP: use [[TQ7506]] or [[5463]] to link to a Grid Square or another Image.
For a weblink just enter directly like: http://www.example.com

New You can add a list of keywords as well as (or instead of) a description. On a separate line at the end of the description just type 'Keywords:' followed by your list. Keywords are useful to add words to aid people searching for images, without including the words in the description itself.

Further Information

Primary geographical category
Ladder stile

Date photo taken
27 June 2010 [ Use Today's Last Submitted Current Date ]

(please provide as much detail as possible, if you only know the year or month then that's fine)

Preview Submission in a new window
Retrieving Images

There are two search contexts:
(1) the whole image collection
(2) one’s personal image set
Search queries can be quite complex.

 Examples:
Search term: grid-square=SE2324
- finds all pictures taken within grid-square SE2324
Search term: photo-id = 1743789
- retrieves the picture whose accession number is 1743789
Search term: keyword=Redcar
- finds all images whose descriptive data contain the word Redcar
Search term: keyword=Redcar-sand-dog
- finds all images whose descriptive data contain the word Redcar but do not include the word sand or the word dog
Search term: Contributor=Philip Barker
- finds all pictures submitted by Philip Barker
Search term: Contributor=Philip Barker AND Date=03-20-2010
- finds all pictures submitted by Philip Barker on the specified date
Retrieval from a Personal Collection

Photographs

Click column headers to sort in a different order

This page shows the latest 100 images, more are available via the search interface

<table>
<thead>
<tr>
<th>?</th>
<th>Grid Ref</th>
<th>Title</th>
<th>Submitted</th>
<th>Classification</th>
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<tr>
<td>♀</td>
<td>NY6752</td>
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5. Conclusion – Key Points

• Pictorial forms are a semantically rich source of information.
• Pictures are a powerful learning resource.
• Pictorial pedagogy is concerned with using pictures to support learning.
• Large collections of images need a pictorial information system to store, manage and retrieve them.
• Powerful search engines are needed in order to retrieve image subsets for particular learning scenarios.
• Approach is generic in that it can support any subject domain
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