Development of a Web-based Remote Sensing Software for Schools

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„We would understand the earth, if we could see it from above“  
Sokrates  

„As I flew around the earth, I recognized its beauty…“  
Jurij Gagarin
Educational Standards

Standards for the competence area "Spatial Orientation"
“topographic knowledge and skills and competences (...) to produce simple maps of one’s own.”

Standards for the competence area "Acquisition of Knowledge/ Methodology"
“Knowledge of sources and forms of information, and information strategies (M1), ability to gather information (M2), ability to analyse information (M3), ability to describe methodological steps for acquiring geographical/ geoscientific information (M4)”

Standards for the competence area "Evaluation"
“They learn, about the different value of maps, aerial photographs and satellite images (...) transform data into maps or diagrams”.
Satellite Images in Schools – Global to Local

Scale Level

GLOBAL

Examples

• Hole in the ozone layer
• Shifting of ecozone
• ...

REGIONAL

• Deforestation of the rainforest
• Desertification
• Land-use change and land consumption
• ...

LOCAL

• Discovering proximity
• Transport infrastructure
• Digging and mining of georessources
• ...

Use of Remote Sensing
I have already worked with satellite images at school ...

- Turkey (n=200)
- Germany (n=830)
- Poland (n=161)
- England (n=121)
- South Korea (n=243)
- USA (n=102)
Reasons for using or not using satellite images in schools

- satellite images: yes
  - up-to-dateness
  - fast availability
  - motivating for students
  - abundance of information

- satellite images: no
  - not learned during own studies
  - no interest in satellite images
  - fear of new medium
  - difficulty of accessibility
  - abundance of information within the satellite image
  - purchasing problems
  - technical equipment of school not good enough

Survey of 65 respondents
ERDAS IMAGINE 9.3
(Source: http://www.erdas.com/portals/0/files/screenshots/IMG_Coherence_Change.JPG)

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Conversion from Tiff
Remote Sensing Software for Students

UNESCO Bilko 3.3
(Source: own screenshot)
LEOWorks 3.0
(Source:http://www.eduspace.esa.int/subdocument/images/Leoworks.gif)
PIXEL-GIS-Strahlungswertanalyse

Landsat7 19-11-1999 NDVI=43

PixelGIS 3.0
(Source: own screenshot)
Evaluation and Dissemination of Remote Sensing Software **BLIF**

- Basic conditions for requesting remote sensing software in schools
- Furthering of a didactical remote sensing concept
- Development of teaching and learning aids (conforming to educational standards)
- Compilation of satellite images on a dynamic web server
- Development of **BLIF**
Conception of BLIF

**Didactical Principles**

- Usability
- Constructivism
- Action-oriented
- Functionality
- Individual
- Exemplarity
- Method progression

**Two Modes**

- BLIF
  - Beginner
  - Expert

**User Level**

- „Expert“
- „Advanc. Learner“
- „Beginner“

**Software Functions**

- Image analysis
- Image classification
- Image enhancement
- Basic functions
Conception of BLIF

Didactical Principles

Two Modes

User Level

„Expert“
„Advanc. Learner“
„Beginner“

Software Functions

Image analysis
Image classification
Image enhancement
Basic functions

User Level

„Expert“
„Advanc. Learner“
„Beginner“

Software Functions

Image analysis
Image classification
Image enhancement
Basic functions
Assistent Mode: „Beginner“

To create a colour composition you have to combine three different bands. Each combination gives you specific information about the chosen image area. Find a suitable band combination. Use the students- information!
To create a colour composition you have to combine three different bands. Each combination gives you specific information about the chosen image area. Find a suitable band combination. Use the students-information!
Conception of BLIF

Assistant Mode: „Expert“

To create a colour composition you have to combine three different bands. Each combination gives you specific information about the chosen image area. Find a suitable band combination. Use the students’ information!
Technical Features

Georeferencing
Technical Features: Band Composites

RGB=[321]  RGB=[543]  RGB=[432]
Technical Features: NDVI
Technical Features: Supervised Classification

- Settlement
- Forest
- Grassland
- Farmland
- Water
- Unclassified
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Thank you for your attention!

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