

# Research-Oriented Teaching: A tool to develop skills for problem solving strategies

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# Principles

## Research-oriented teaching at Freie Universität Berlin ...

- ... meets high scientific standards and is based on current research
- ... enables critical reflection and thinking
- ... motivates and promotes societal commitment
- ... prepares for both research and evidence based professions
- ... supports international exchange

# Learning Targets

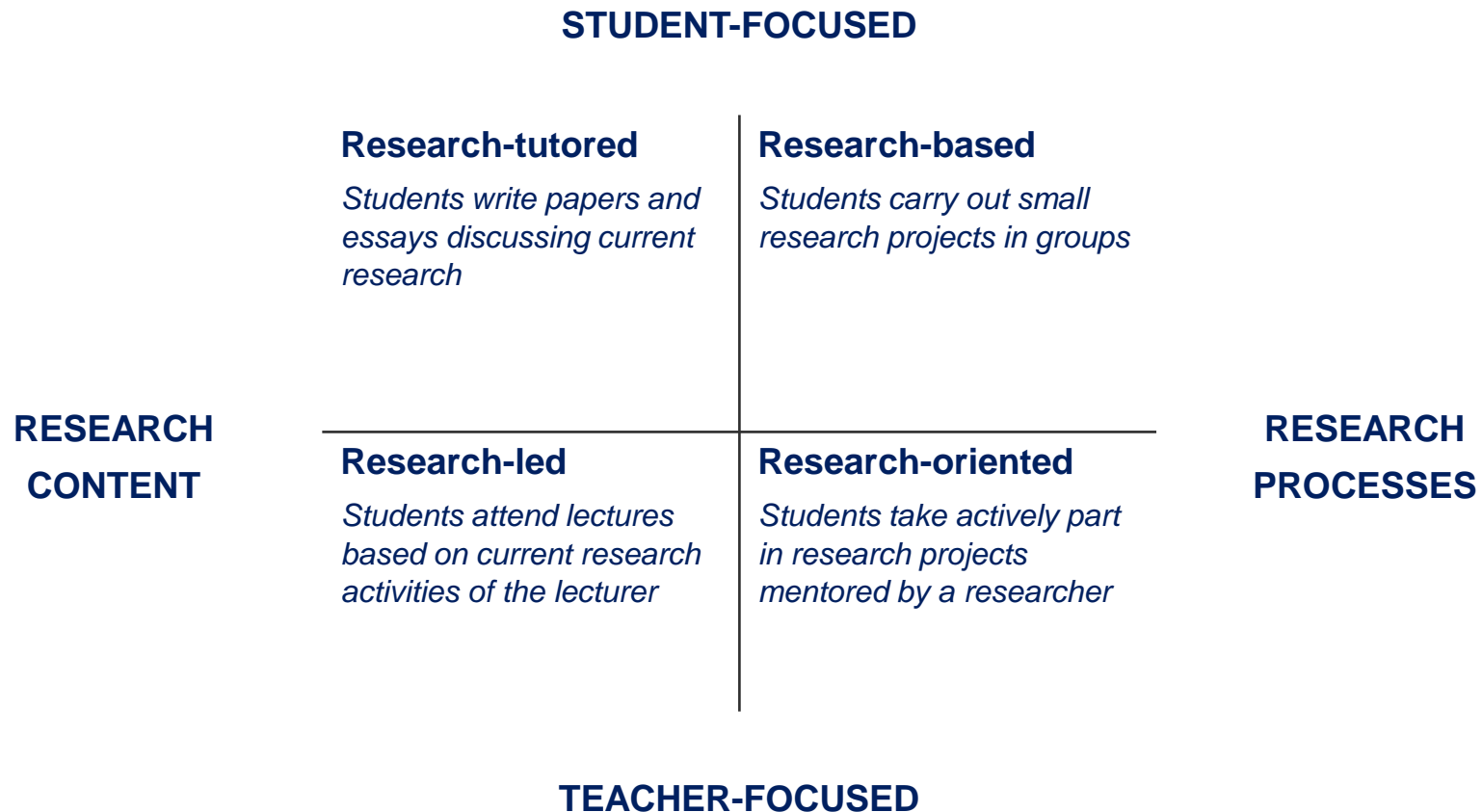
Knowing - knowledge can be repeated;

Directing - knowledge is not only known, but also can be transferred (*to apply*);

Understanding - the capacity to gather knowledge and information and to organize them in a systematic way (*to classify*);

**Analysing - the capacity to describe complex structures, to identify causes and effects and to understand processes.**

# Dimensions of Teaching-Research Nexus



based on Healey (2005)

# **Good Practice in Research-Oriented Teaching at Freie Universität Berlin**

## **An Example**

# Project Module

## Teaching Concept

Topics will be grouped in interdisciplinary modules focussing on *problems* and *holistic concepts* rather than disciplines.

They comprise modern tools like GIS, the integration of traditional knowledge and participatory approaches in sustainable resource management.

# Project Module

## Field Exercises – A Pilot Project

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*

## Overall Goal

Understanding the processes of erosion and water balance in space and time in a watershed.

# Project Module

## Field Exercises – A Pilot Project

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*

## Overall Goal

It was intended that the students develop concepts for the sustainable management of limited water and soil resources of the Hare catchment area, southern Ethiopian Rift Valley region.



# Project Module

## Field Exercises – A Pilot Project

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*

## Configuration of the Project Module

The module is composed of three components:

(1) An *Introduction*, including lectures, field trips and presentations by students (1 week), ...



# Project Module

## Field Exercises – A Pilot Project

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*

## Configuration of the Project Module

The module is composed of three components:

(2) ... *field training* (2 weeks) ...





# Project Module

## Field Exercises – A Pilot Project

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*

## Configuration of the Project Module

The module is composed of three components:

(3) ... a *Seminar*, where data collected during field training are evaluated, modelled, compiled in a report und presented in a final workshop (3 weeks).



# Project Module

## Field Exercises – A Pilot Project

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*

#### Learning targets:

1. **Describing** soil-water-interaction.
2. **Determination** of catchment area characteristics important for modelling of soil erosion risk and water budget.
3. **Comparison** of different modelling results.

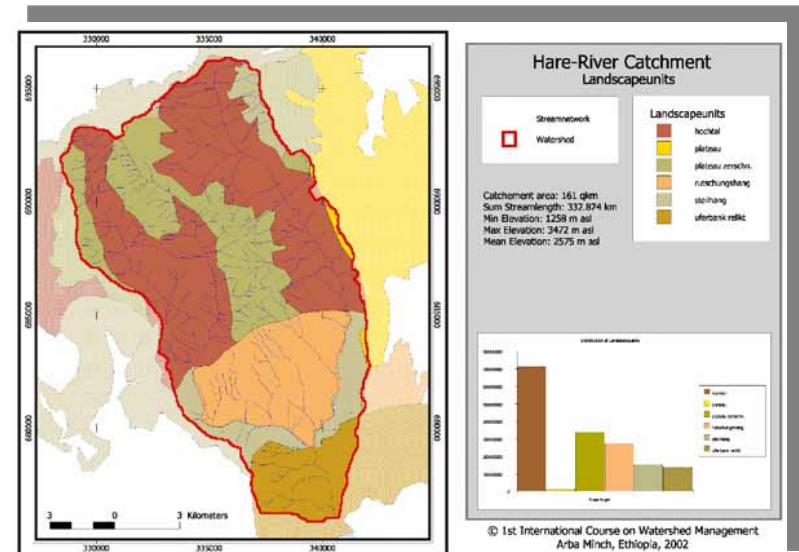
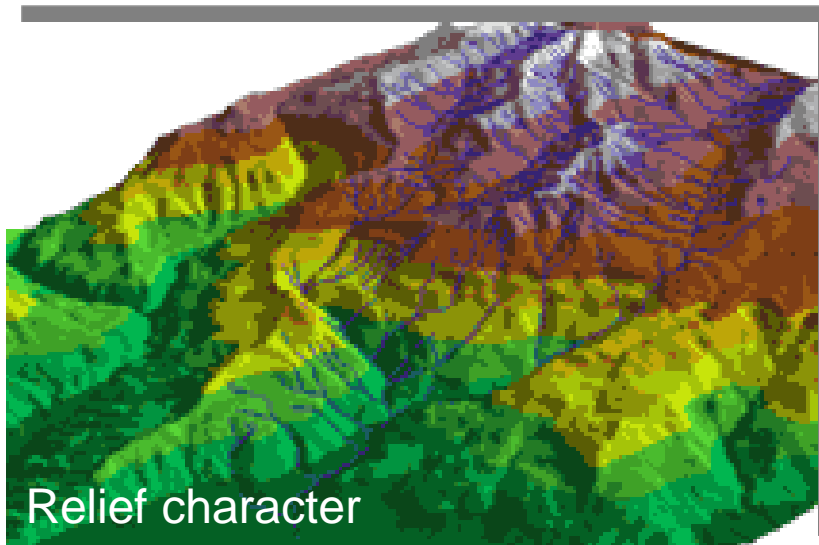


# Project Module

## Results

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*



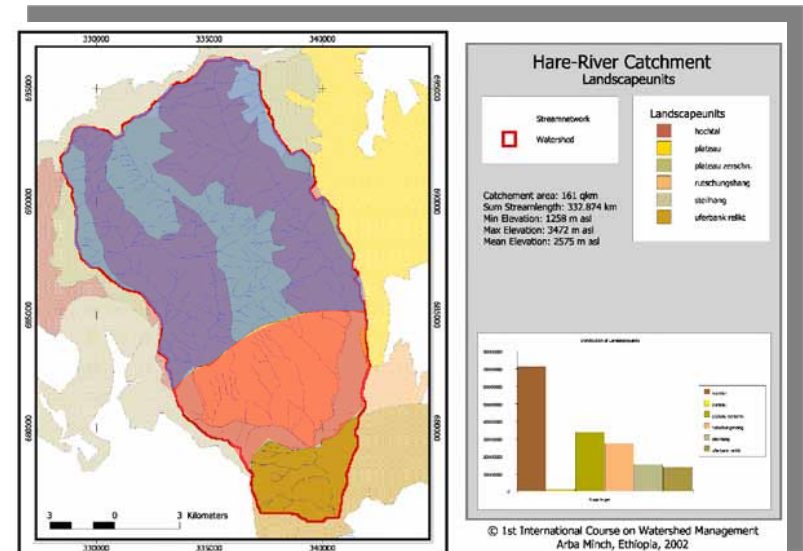
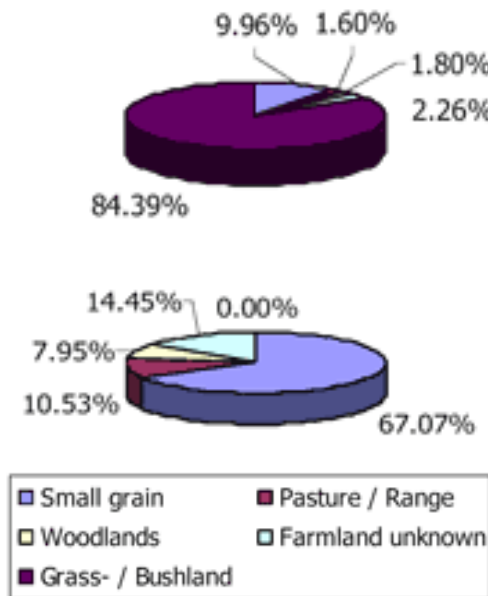
# Project Module

## Results

### International Course on Landscape Sensitivity

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Land use character

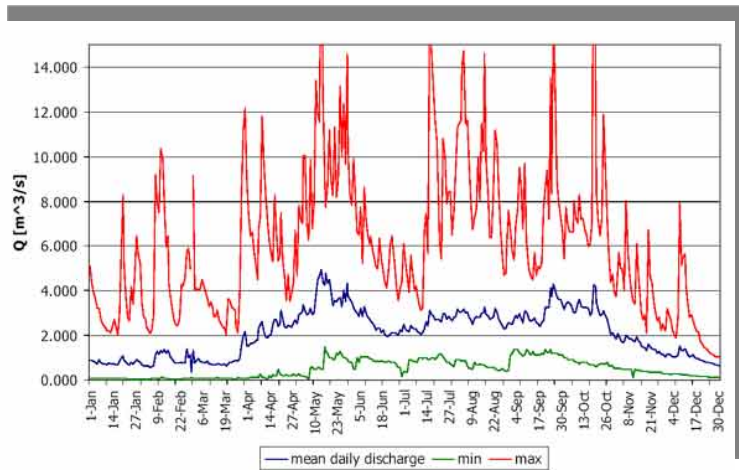


# Project Module

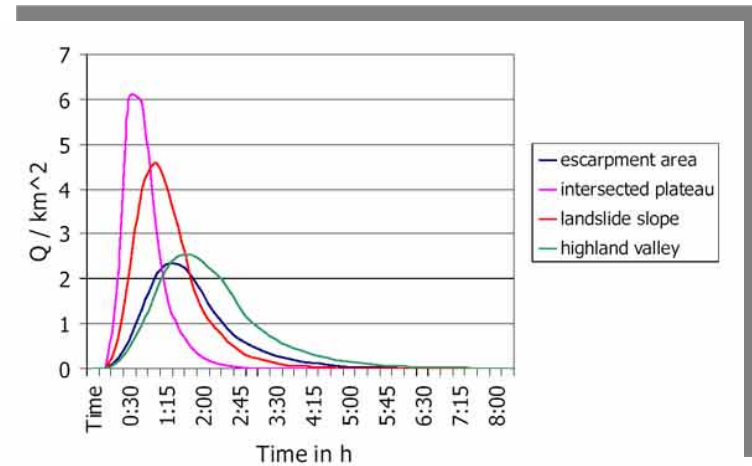
## Results

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Water balance – time series analysis



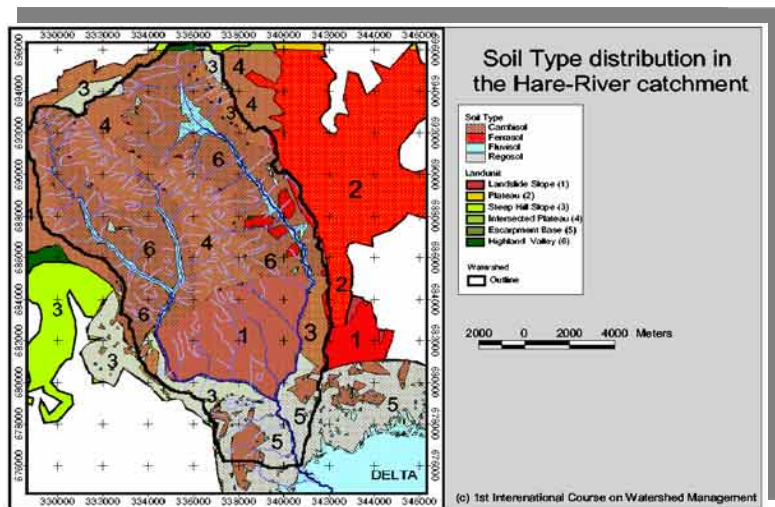
and hydrograph modelling.

# Project Module

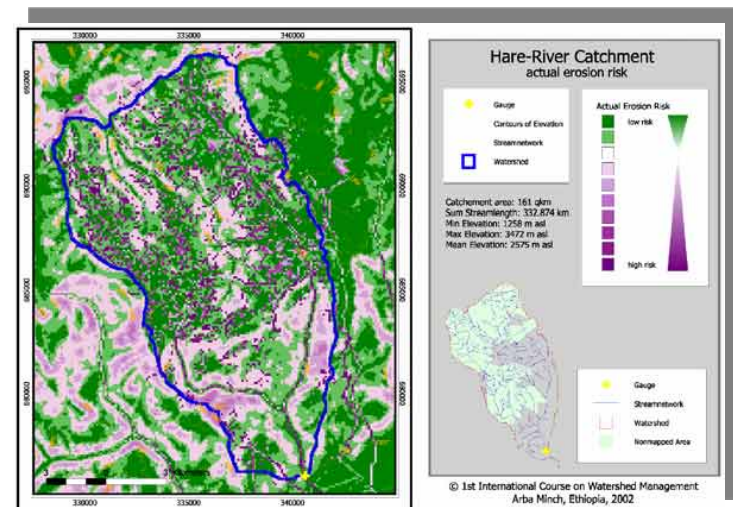
## Results

### International Course on Landscape Sensitivity

*Arba Minch Water Technology Institute August 2002 and August 2003*



Analysing landscape characters



and predicting active erosion risk.

# Project Module

## Field Exercises – A Pilot Project

### International Course on Landscape Sensitivity

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#### Learning targets – soft skills:

1. **Intercultural** cooperation.
2. **Intercultural** communication.
3. **Interdisciplinary** teamwork.
4. **Independent** working.
5. **Presentation** of results.



# Project Module

Character of the programme and teaching concept

Studies require a high standard of student's self-organisation and self-responsibility.

Teachers act more as advisors and supervisors than as typical instructors.

# Project Module

## Learning Targets

The limitations of disciplinary concepts will be demonstrated.

Disciplinary concepts need to be overcome to identify sustainable solutions.





# Research Competencies

## **Scientific knowledge is reflected knowledge**

- Reflecting on methodological limitations
- Reflecting on practical application
- Reflecting on social and ethical relevance

## **Scientific knowledge requires scientific communication**

- Presentation of scientific results
- Publication of scientific results

## **Scientific knowledge is methodologically controlled**

- Determining the sources of information
- Collecting and processing of information
- Analysis and interpretation of information

## **Scientific knowledge is cumulative**

- Discussing theoretical approaches
- Reviewing previous research
- Identifying gaps or contradictions
- Rationale for a research question

**Thank  
you very  
much for  
your  
attention!**

# Principles

## Teaching and learning principles according to our motto:

### VERITAS

We require commitment to high methodological standards and proper academic practices

### IUSTITIA

We foster talents regardless of sex, social, ethnic or religious background

### LIBERTAS

We encourage autonomy and self-regulation in the learning process