



The role of GLOBE in the reformed teacher education programs at University of Cologne

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German Federal State of North Rhine-Westphalia

- Educational Standards
- Core curricula for elementary and secondary schools



University of Cologne

- Teacher education
- Scientific education

Requirements	Approaches
Linked scientific research and teacher education	e. g. Earth Observation Programs
Profession oriented education	e. g. Inquiry-based Learning
Internationalization of education programs	Network of GLOBE, universities and schools
Cross-disciplinary Integration	STEM-disciplines, languages

Implementation



The GLOBE Program

- Protocols and datasheets
- Database and data visualization
- Smartphone-Apps
- Science



International GLOBE lecture series at University of Cologne

- Pre-service teachers
- Students of natural sciences
- Students interested in IBL
- In-service teachers

Lecture	Seminar
An international perspective on STEM education	<ul style="list-style-type: none"> • Methodology of IBL • Societal participation in the frame of Citizen Science
<ul style="list-style-type: none"> • Training and certification • Network for students and teachers • Embedding GLOBE into school curricula's 	<ul style="list-style-type: none"> • Statistical Analysis of environmental data • Cross-disciplinary approaches in STEM education

Workshops



GLOBE Seminars

- Pre-service teachers
- Students of natural sciences



GLOBE Workshops at Learning Laboratory Pulheimer Bach

- Pre-service teachers
- In-service teachers
- Students of natural sciences

Objectives

Teaching

Research

Spin-off

Transregional Collaborative Research Center 32

Soil Moisture Pattern Analysis using SAR data and Modelling. A project in the Frame of TR32: Patterns in Soil, Vegetation and Atmosphere. www.tr32.de

SMAP Protocol and GLOBE data	TR 32	Outreach
	 <ul style="list-style-type: none"> • Field Measurements • Remote Sensing • Modelling 	 The GLOBE Program
Validation data		



Translated SMAP eLearning Module



Online-evaluation of GLOBE lecture series



Internationalization

- Traineeship for GLOBE students in cooperation with Jet Propulsion Laboratory (USA)
- Students exchange in cooperation with University of Toledo (USA) and Mount Royal University (Canada)
- Translating Protocols and eLearning-Modules in cooperation with GLOBE Implementation Office
- Cooperation with international institutions and partners within the frame of GLOBE

Interdisciplinary Cooperation

- GLOBE's inquiry based learning approach provides points of entry for all STEM disciplines and facilitates cross-disciplinary collaboration at University of Cologne
- Methods provided by GLOBE are applicable both in teachers education programs and in science programs

Students' Perception

Motivate and Attract Students to Science (MASS)

MASS shows the relevance of natural sciences to real life by focusing on digital learning, early inquiry and the support of low achievers. www.mass4education.eu



Environmental Monitoring using Smartphones

Smartphones and Apps are suitable tools for monitoring data. Approaches using Smartphones for environmental research and STEM-education will be developed, piloted and analyzed.



Phase 1

- Development of IBL teaching formats with GLOBE
- Network building within UoC, nationally and internationally
- GLOBE Training for students and teachers

Phase 2

- Translating GLOBE E-Learning tutorials into German
- International student exchange with GLOBE partners
- Cross-disciplinary teaching formats

Phase 3

- Establishment of research projects
- University Network for Science Education and Research
- Further Development of IBL teaching formats

2015

2016

2017

2018

2019

2020

2021