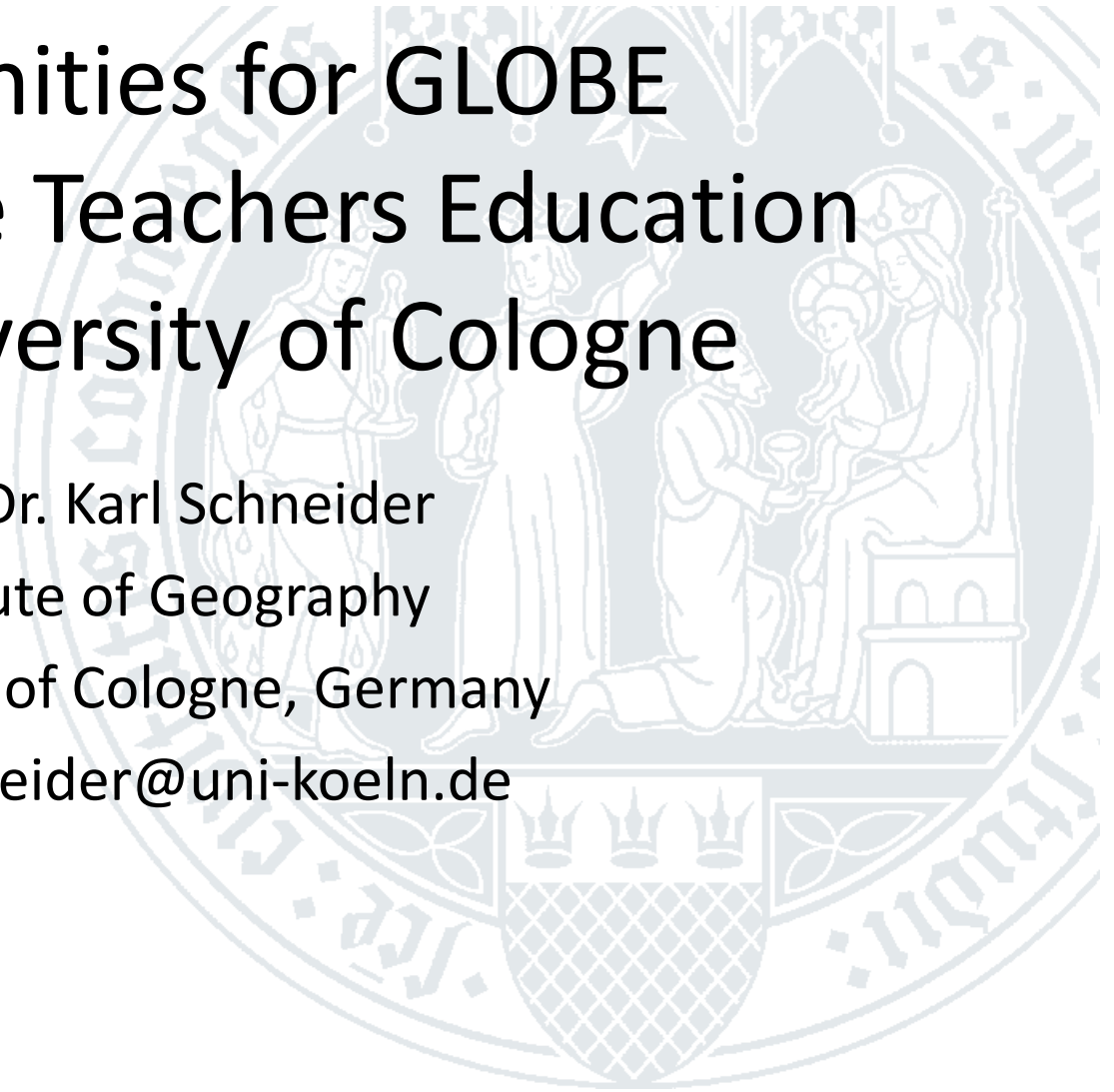
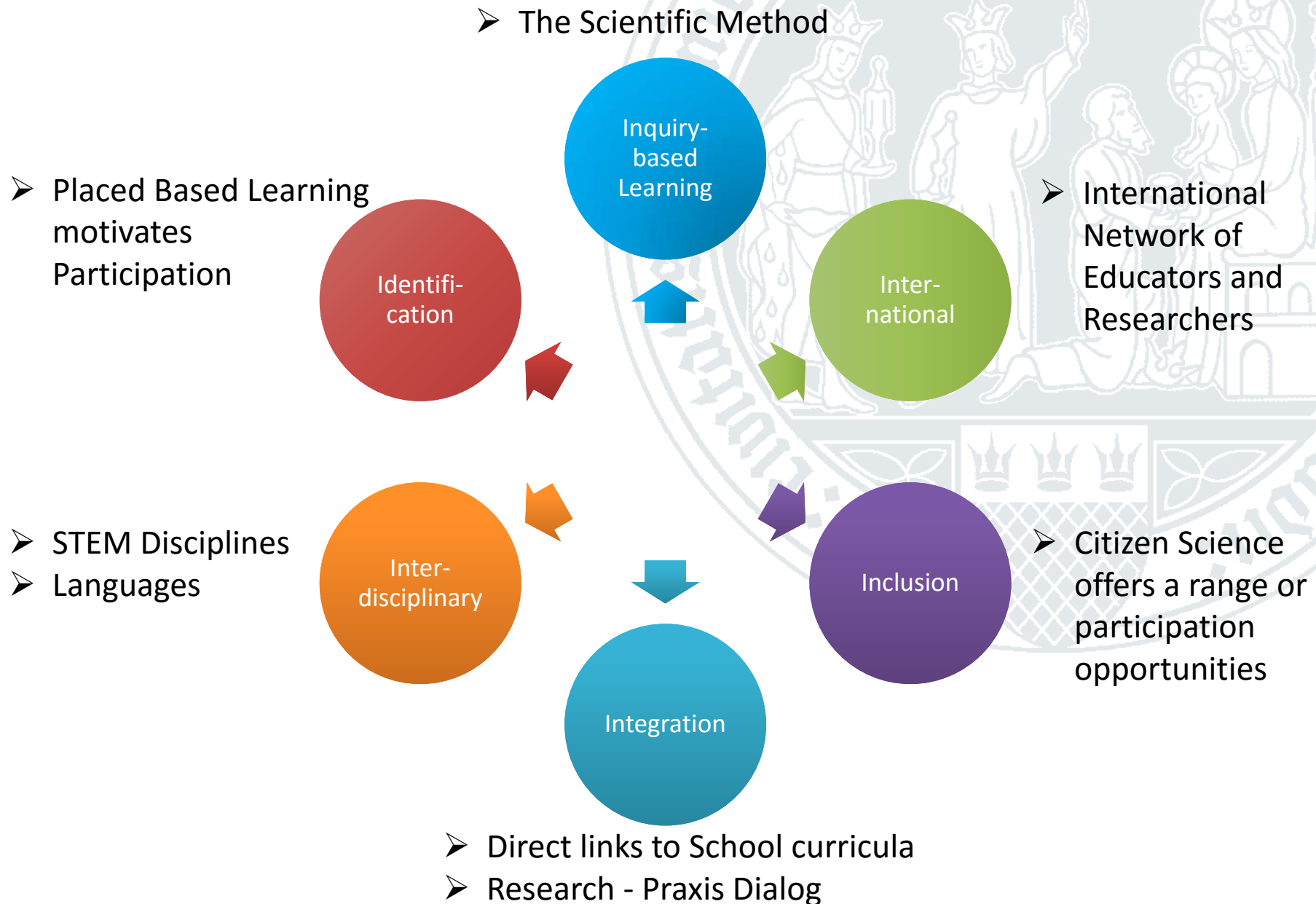


Opportunities for GLOBE in Pre-Service Teachers Education at the University of Cologne

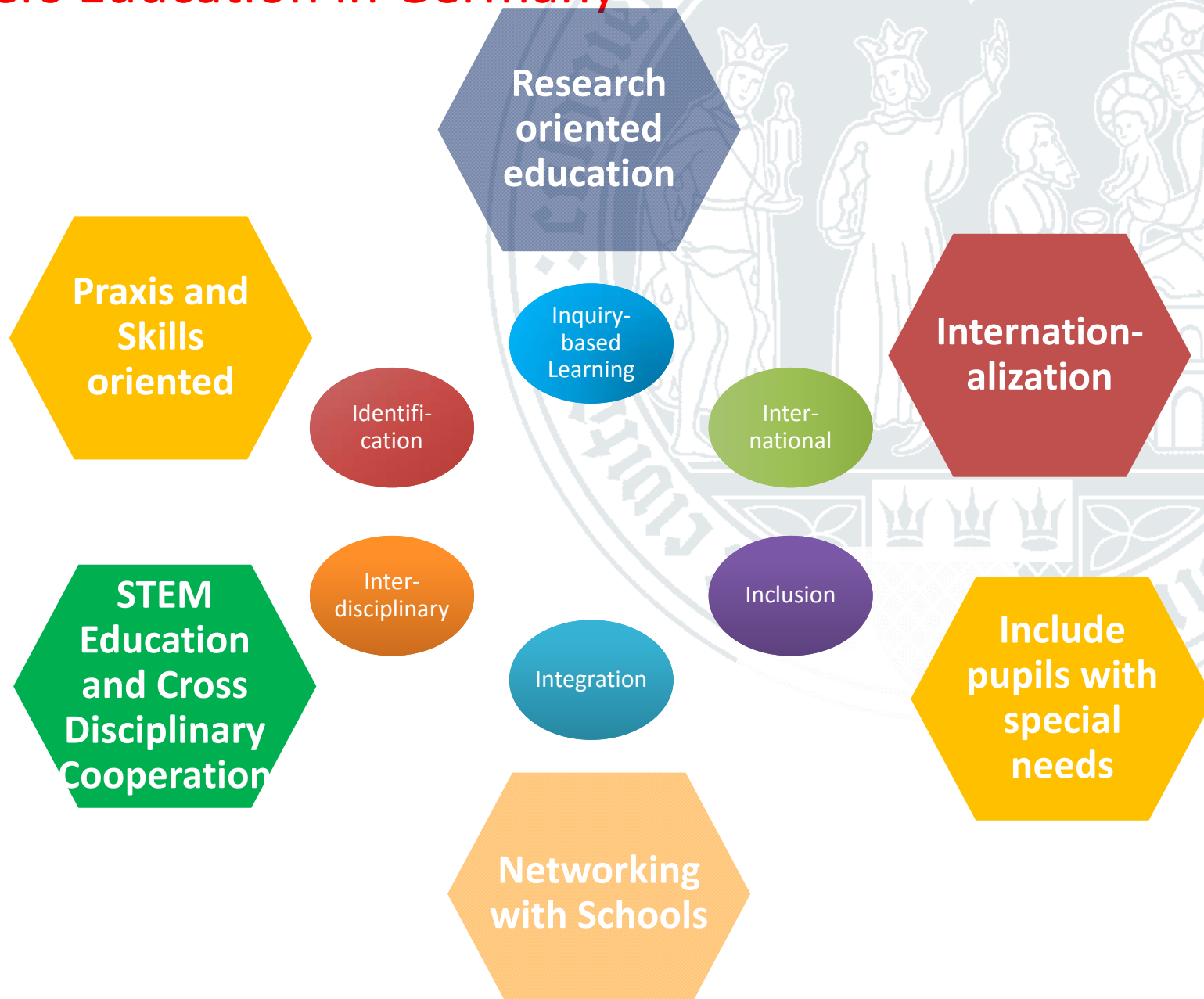
Prof. Dr. Karl Schneider
Institute of Geography
University of Cologne, Germany
karl.schneider@uni-koeln.de



Key Elements of GLOBE



The Key Elements of GLOBE match the goals of reformed Teachers Education in Germany



The rigid course schedule create a challenge to integrate GLOBE into Teachers Education programs

Course schedule Geography program (B. edu.)

1. Sem.	2. Sem.	3. Sem.	4. Sem.	5. Sem.	6. Sem.
Intro (9) Einführung in die Sem. + Exk. 6 Kartenkunde Lecture 3				Science Foundation (3) 3	
	Physical Geography (15) VL Relief & Boden 3 PS Relief & Boden 3 VL Klima, Wasser, Vegetation 3 PS Klima, Wasser, Vegetation 3			Methods (9) Seminar 3	Lab (6) 6
		Exam (3) 3	Human/Phys. Geography (9) VL Geographie 3 Seminar I 3 Seminar II 3		
Human Geography (15) VL Urbanisierung & Wirtschaft 3 PS Wirtschaft & Stadt 3 VL Gesellschaft & Kultur 3 PS Ges. & Kultur 3	Exam (3) 3	Didactics (9) Lecture 3 Sem.+Exk. 6			Thesis (12) Abschlussarbeit 12
15	15	12	12	9	6 12
Educational Science					
2. Discipline					

e.g.: Concepts and Methods in Geography with Practical Examples

e.g.: Scientific Measurements and GLOBE Protocols

e.g.: Inquiry Based Learning Concepts in Schools

= 69
(+12)
= 30
= 69

Numbers = credits per course / module / semester

Universities offer great potential to recruit new GLOBE teachers and to support innovations to schools

The teaching formats

- Disciplinary seminars and lectures as part of the regular study program

Summer term 2014: 10 students

Seminar: GLOBE: An international, research-oriented environmental education program for schools

Lab: GLOBE: Practical applications of research oriented environmental education

Summer term 2015: 10 students

Lab: GLOBE: Practical applications of research oriented environmental education

Summer term 2016: 32 students

Seminar: societal participation in the frame of citizen science

- Interdisciplinary courses

Winter term 2015/16:

Lecture Series “An International Perspective on STEM Education”: up to 46 students

Accompanying Seminar: 14 Students

Winter Term 2016: (approx. 20-25 students)

Lab: Methods of inquiry based Learning

Statistical Analysis of environmental data using GLOBE data (International Masters of Environmental Science)

Plan for Winter Term 2017:

Inquiry Based Learning approaches with GLOBE in Biology and Geography (co-teaching)

- Internships at schools

- professional application
- praxis semester

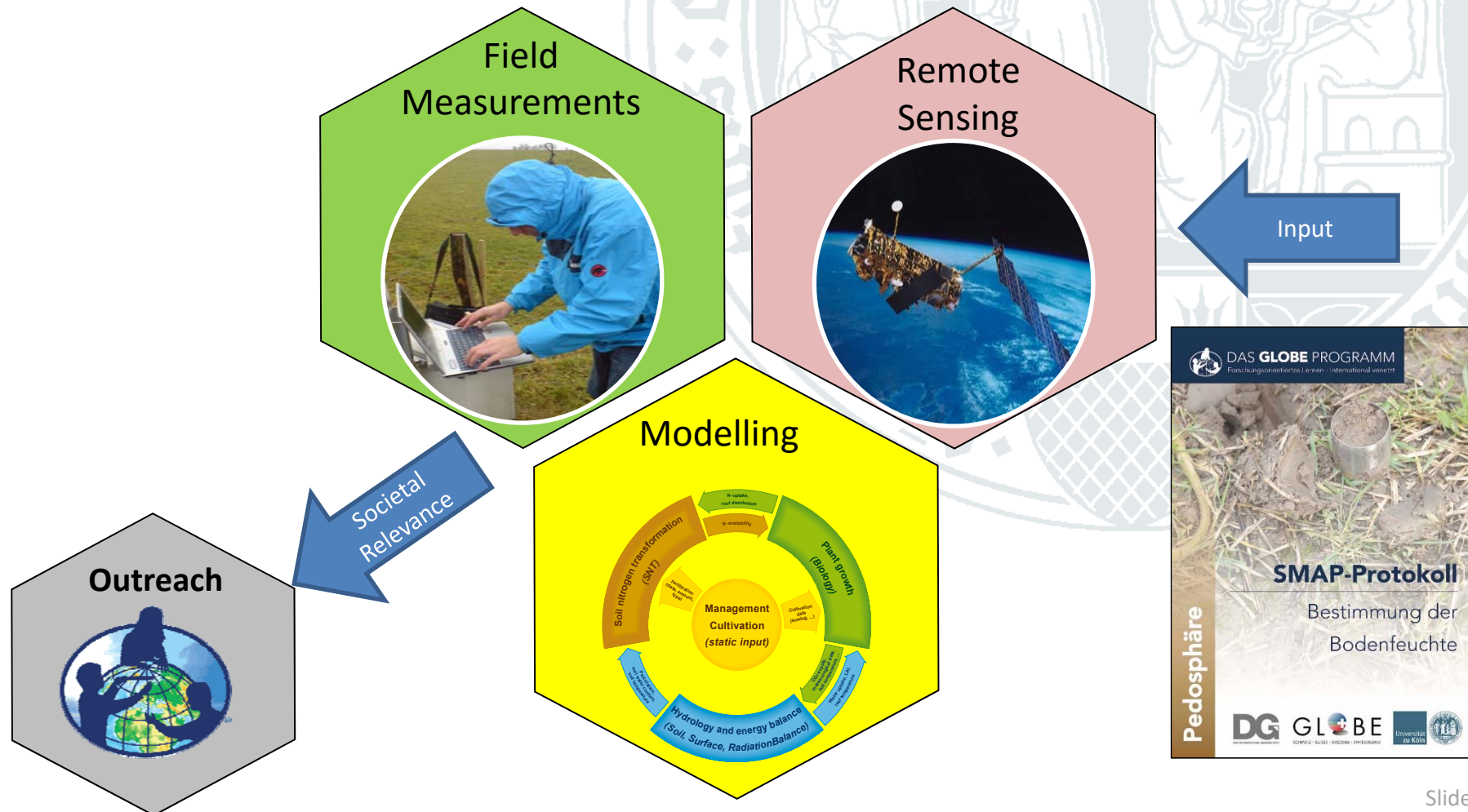
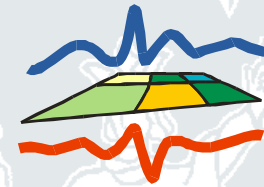
- Continuing Teachers Education / GLOBE trainings / technical support

Winter term 2015/16: 5 teacher trainings with 4 – 10 participants

UoC's Concept: GLOBE provides Links to Research Projects

Research
oriented
education

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



UoC's Concept: GLOBE inspires students to do profession oriented research theses

Research
oriented
education

Bachelor theses within the last year:

Leonie Höer: Das Konzept und die Umsetzung des Forschenden Lernens im Wandel der Zeit

Development and Changes of Concept and Implementation of Inquiry Based Learning

Daniel Vilvo: Smartphone-Einsatz im Geographieunterricht? Eine kritische Analyse hinsichtlich der Nutzung mobiler Endgeräte bei naturwissenschaftlichen Themenfeldern

Smartphone Application in Geography Lessons: A critical Analysis with regards to the use of mobile devices in STEM disciplines

Carina Meier: **Teachers' experience with the GLOBE Program and their motivation to utilize it in American schools**

UoC's Concept: GLOBE is a centre piece for international collaboration in teachers education programs

Inter-
national-
ization

An international perspective on STEM education

29. Okt. 2015 **Prof. Dr. Karl Schneider** | Universität zu Köln
GLOBE Opportunities of STEM Education at the University of Cologne
05. Nov. 2015 **Dr. Russane Low** | Institute for Global Environmental Strategies
Science Education and Public Outreach: Experience with the GLOBE Program
12. Nov. 2015 **Dr. Joris Veenhoven** | Universität Utrecht und **Matthijs Begheyn** | GLOBE Nederland
A cross curricular learning trajectory in science education
19. Nov. 2015 **Prof. Dr. Kevin Czajkowski** | University of Toledo
Researching the urban climate with GLOBE
26. Nov. 2015 **Markus van de Sand, Christal Schult** | Universität zu Köln
• *Unser Raumschiff Erde – Das 2nd-Schülerlabor*
• *Stadtklima im Schülerlabor*
03. Dez. 2015 **Prof. Dr. Kevin O'Connor** | Mount Royal University Calgary
Effects of participation in Environmental Education programs upon societal participation
10. Dez. 2015 **Prof. Dr. Alexandra Budke, Prof. Dr. Kirsten Schlüter, Prof. Dr. André Bresges** | Universität zu Köln
• *Ich argumentiere, also verstehe ich*
• *Explorative study about knowledge of species in the field of elementary education*
• *Planetary research with Tablets: An example of transatlantic Design Based Research in Education*
17. Dez. 2015 **Jessica Taylor** | NASA, Langley Research Center
GLOBE's role in NASA's outreach strategy and its potentials for elementary school education
21. Jan. 2016 **Prof. Dr. Costas Cartalis** | University of Athens
Mitigating climate change effects in cities: The role and contribution of STEM education
28. Jan. 2016 **Andreas Thieme** | Universität zu Köln
Natur- und umweltwissenschaftlicher Unterricht in der Schulpraxis. Erfahrungen, Methoden, Projekte
11. Feb. 2016 **Dr. Erika Podest** | JPL, California Institute of Technology
SMAP: Satellite mapping of global soil moisture

Die Veranstaltung findet jeweils um **16.00 Uhr**
im **COPT-Gebäude, Seminarraum C231** statt



THE GLOBE PROGRAM



Förderung Gefördert durch die Mathematisch-Naturwissenschaftliche Fakultät der Universität zu Köln
mit Mitteln zur Verbesserung von Studium und Lehre.

Kontakt Andreas Thieme, Geographisches Institut, Universität zu Köln, Albertus-Magnus-Platz,
50923 Köln, andreas.thieme@uni-koeln.de



Approaches in Teacher Education

- Internships
- Study abroad
- Research theses
- Language skills
- International cooperation



GLOBE trainings were certified as teachers continuing education course and provide opportunities for networking

Networking
with Schools



Pädagogische Achse

AKKREDITIERT



**LANDESSCHULAMT UND
LEHRKRÄFTEAKADEMIE**

www.akkreditierung.hessen.de

UoC's Concept: GLOBE is provides opportunities for inclusion and integration

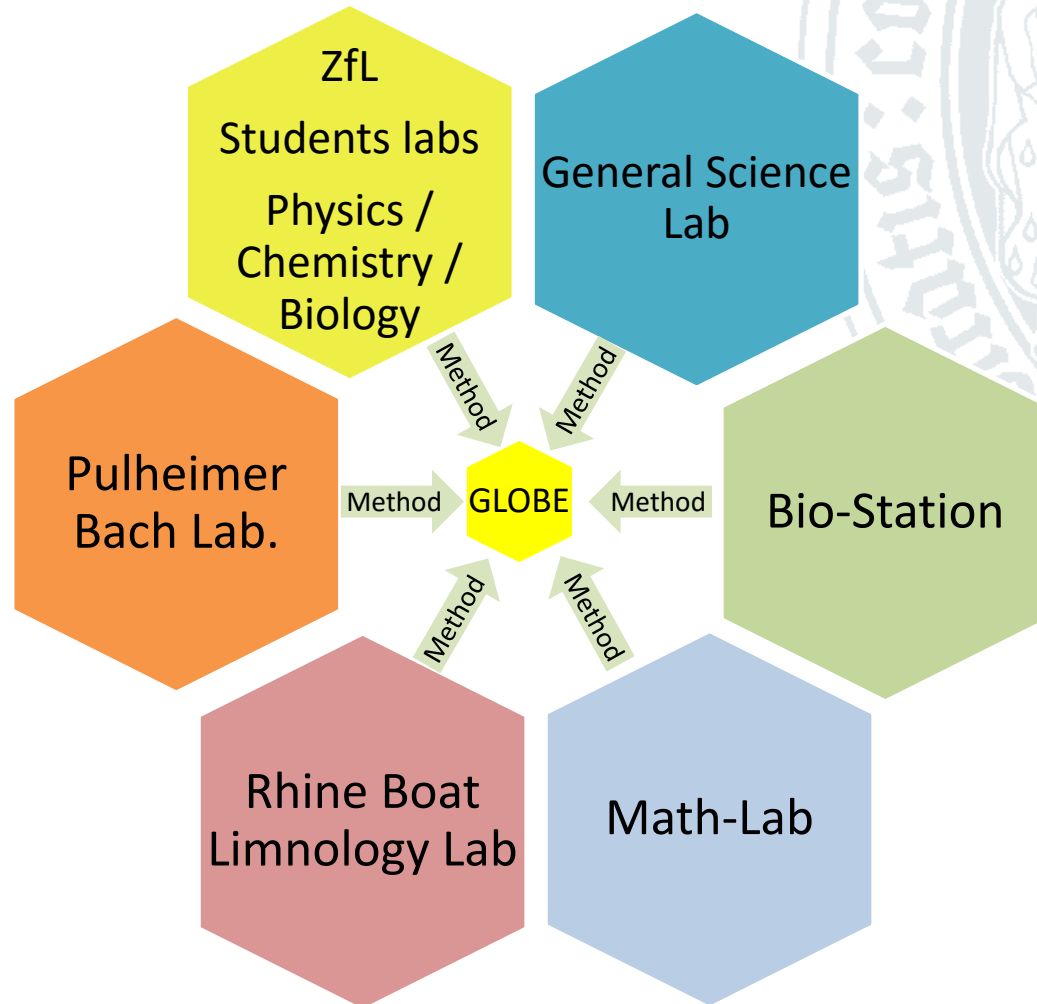
Include pupils with special needs

Large group of refugees in Germany provides challenges for the education system and new integration strategies are needed:

- GLOBE is available in Arabic, thus is can help to bridge the language barrier
- GLOBE based methods help to learn about the new home: Plans to develop an integration project with cities and communities on “Seeing home with new eyes”

UoC's Concept: GLOBE provides links to UoC's skills labs

Skills Labs at UoC:
School goes to University



Strengthen
STEM
Education
and Cross
Disciplinary
Cooperation

Praxis and
Skills
oriented



University goes to School
And
Internationalization

University Network for Science Education and Research

- Student exchange
 - Mutual recognition of courses
 - MOU
 - Compatibility of schedules
 -
- Faculty exchange
 - E.g. in the frame of an International Lecture Series
 - Sabbatical
 - In the Frame of the excellence initiative
 -
- Networking
 - National Partners: Uni. Augsburg, Tübingen, Freiburg, Munich ...
 - International Partners: MRU, UT, U Utrecht, NCAR, JPL,
 - Schools ➔ Pre-Service teachers as agents for innovation