

Geocognition: a new research discipline for the 21st century?



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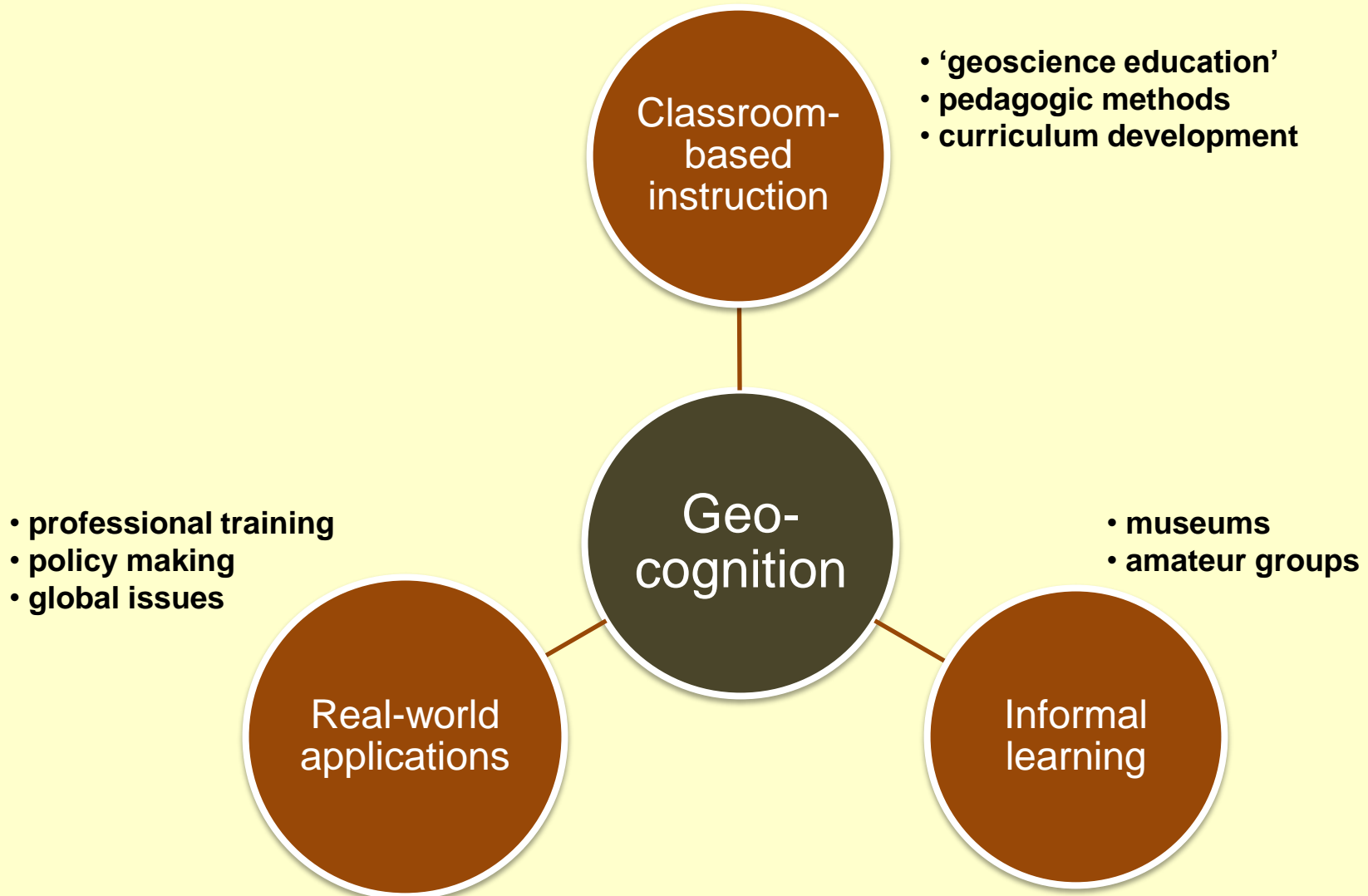


What is geocognition?

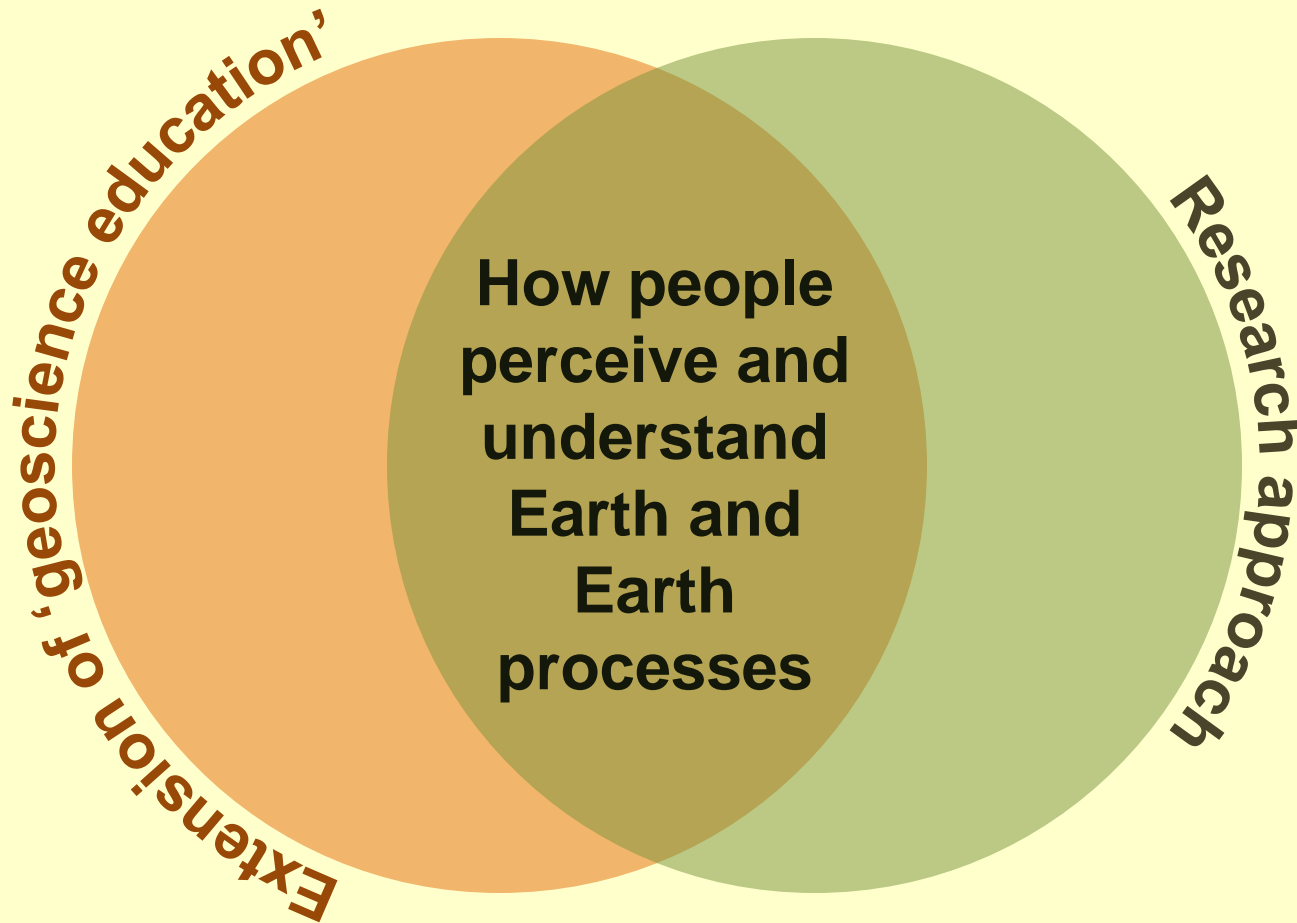
Extension of 'geoscience education'

How people
perceive and
understand
Earth and
Earth
processes

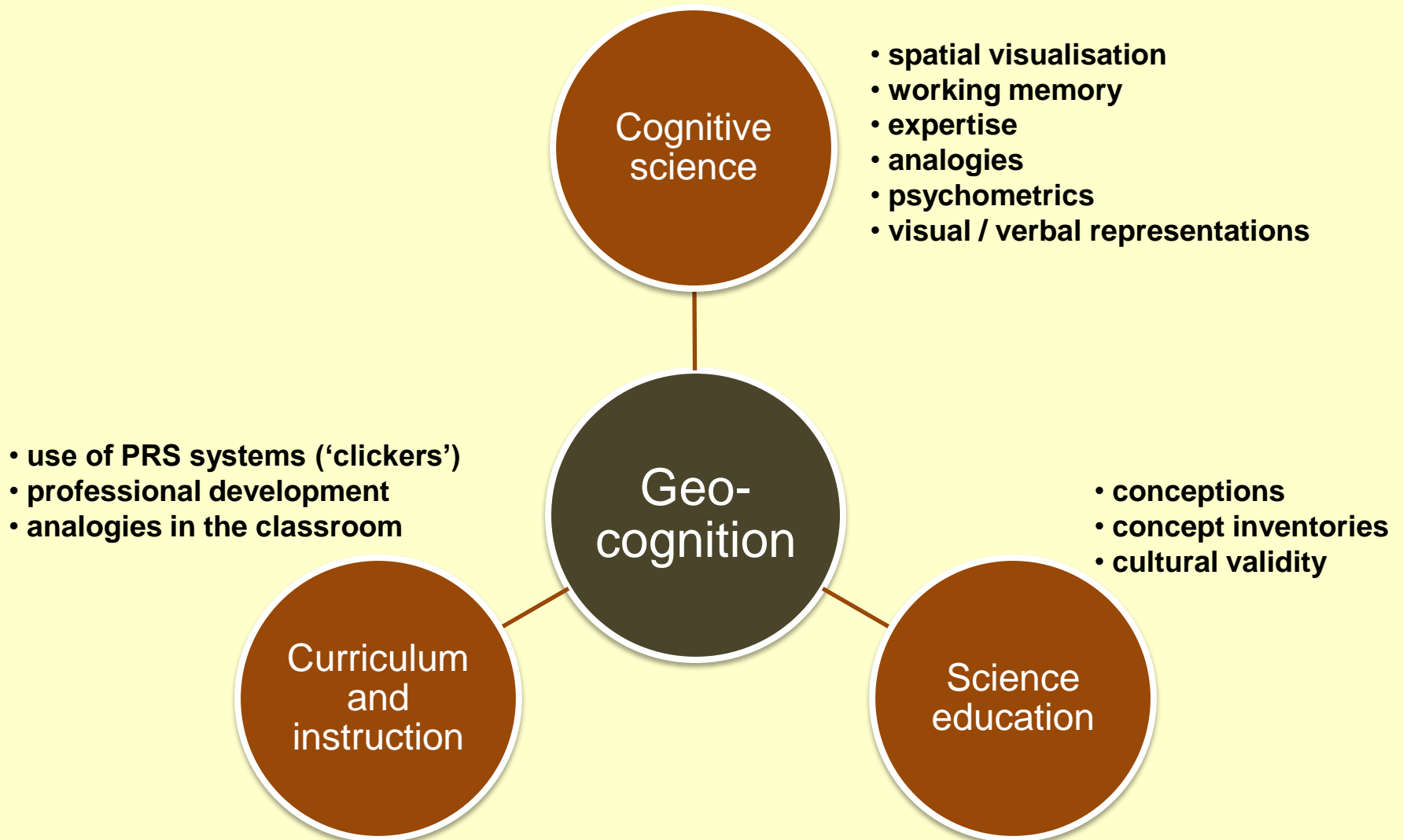
Extension of 'geoscience education'



What is geocognition?



Research approach



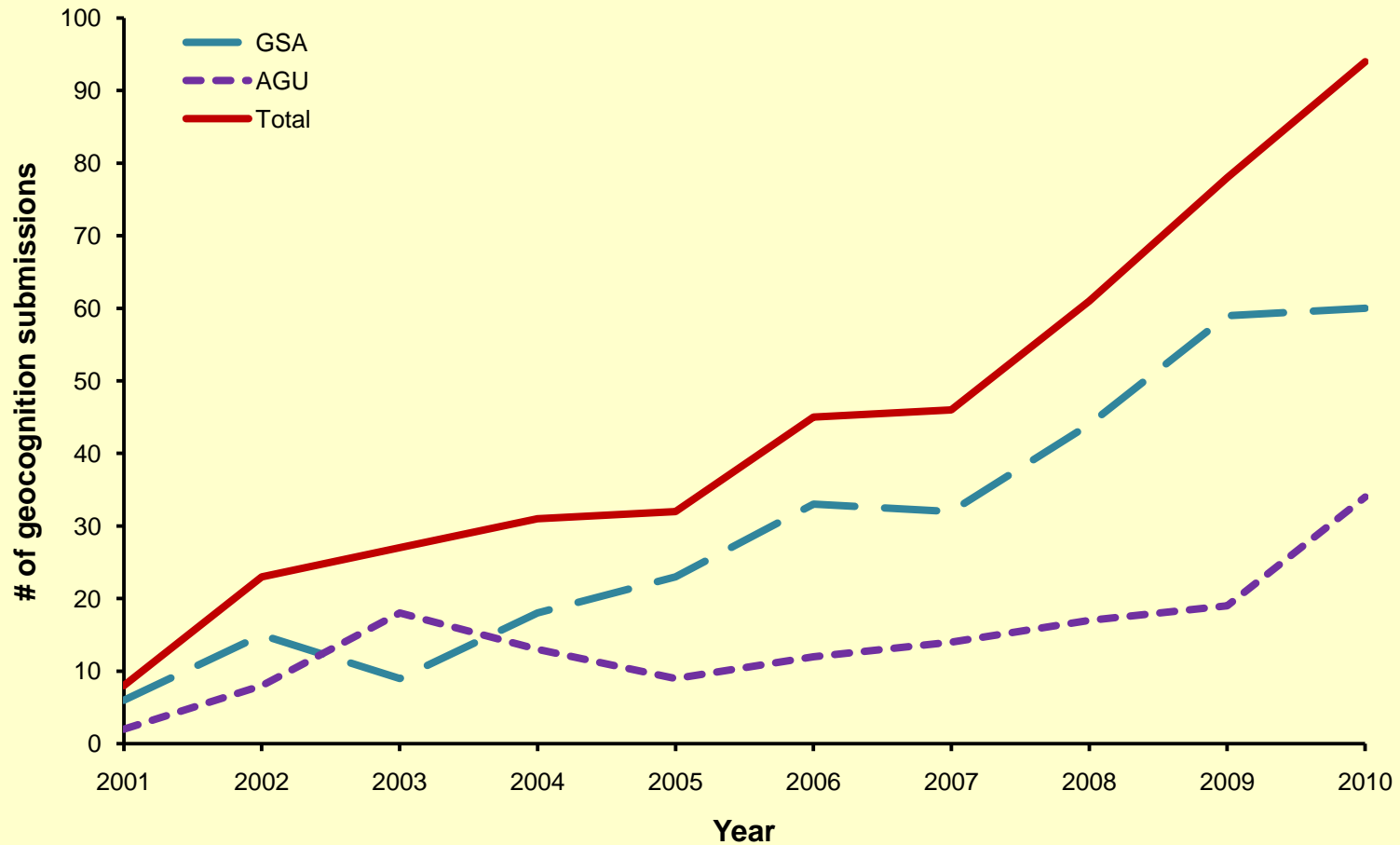
Examples of geocognition research

Focus of research	Example method / approach	Example references
Spatial visualisation skills	Psychometric testing	Titus & Horsman (2009)
Field behaviour / mapping strategies	GPS tracking of field activity	Petcovic <i>et al.</i> (2009)
Expert-novice visualisation of complex data	Eye tracking studies	Libarkin <i>et al.</i> (2010)
Conceptual understanding	Geoscience Concept Inventory	Elkins & Elkins (2007)
Conceptual uncertainty	Interpretation of seismic sections	Bond <i>et al.</i> (2007)
Affective domain	Mixed methods (quantitative / qualitative)	Stokes & Boyle (2009)
Systems thinking	Mixed methods (quantitative / qualitative)	Ben-Zvi Assaraf & Orion (2005)
Working memory	Timed completion of geologic block diagrams	Geraghty-Ward & Libarkin (2010)
Decision making in professional contexts	Interpretation of visual data / role play	Ishikawa <i>et al.</i> (2011)
Technology dependence in fieldwork	Ethnography	Feig (2010)

Myth-busting!

- 1. Geoscience education research is of no value to practising geoscientists**

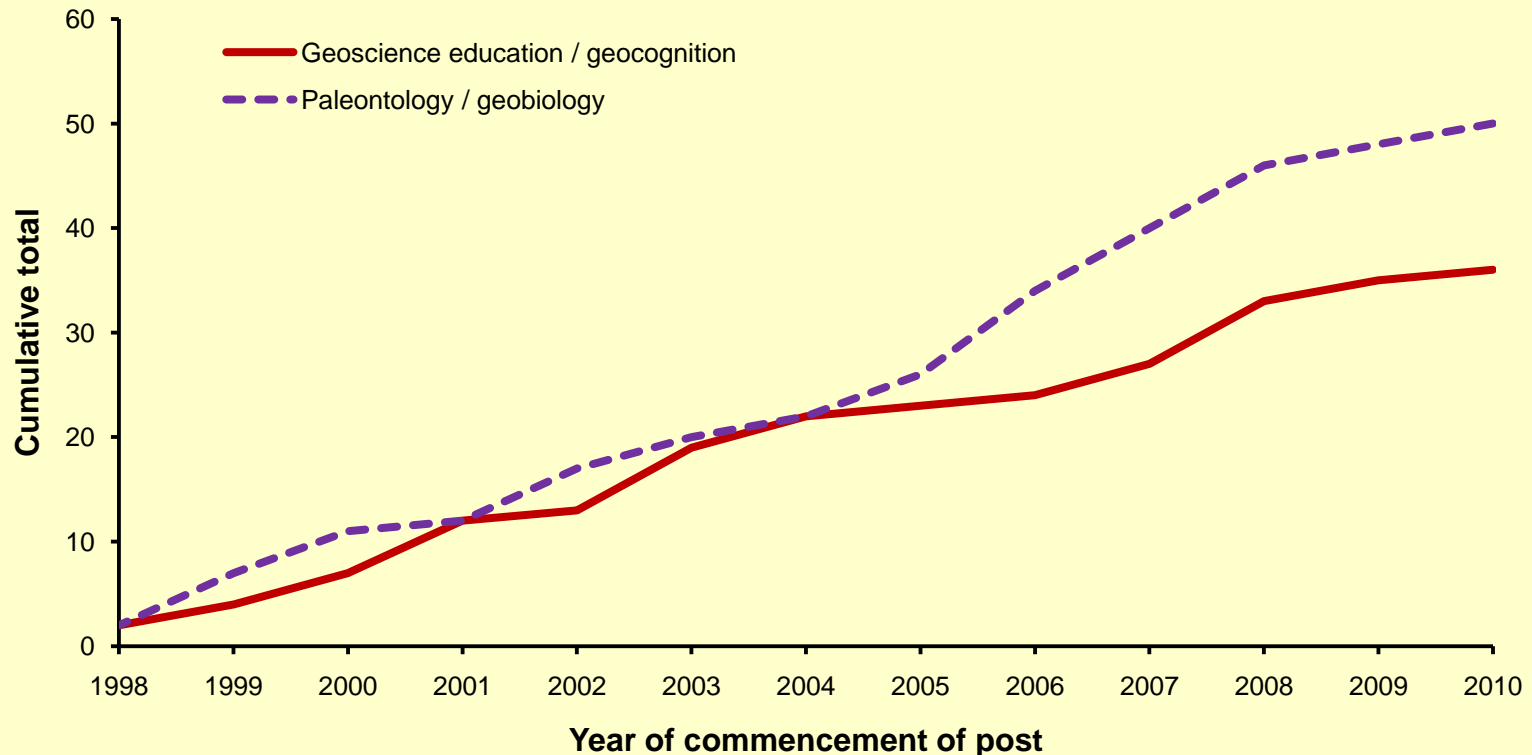
Geocognition abstracts at major US meetings



Myth-busting!

1. Geoscience education research is of no value to practising geoscientists
- 2. Geoscience education does not belong in geoscience departments**

Geoscience education positions at US institutions (tenure-track)

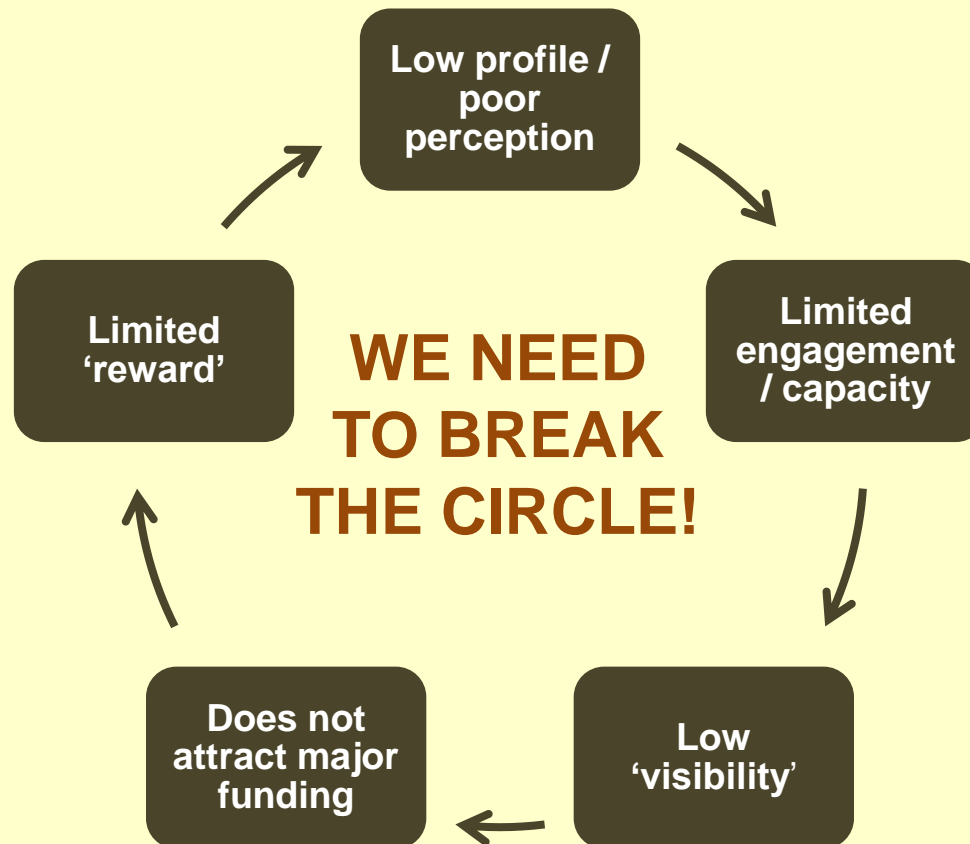


Job advertisements published in 'GSA Today' from January 1998 through November 2010. Tenure-track positions in geoscience education are compared to similar jobs in palaeontology and geobiology (produced by Julie Libarkin, Michigan State University & Scott Clark, University of Wisconsin-Eau Claire).

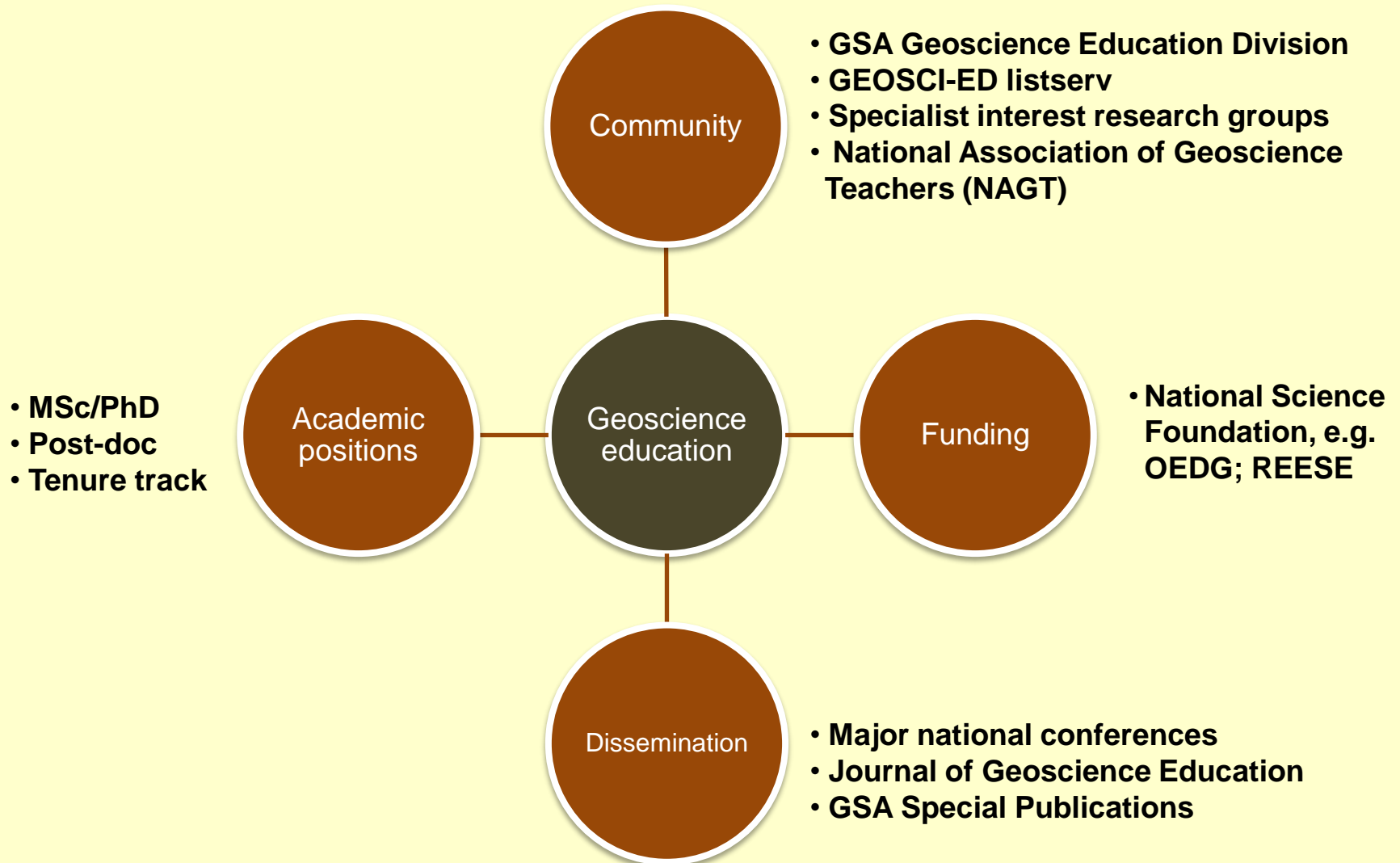
Myth-busting!

1. Geoscience education research is of no value to practising geoscientists
2. Geoscience education does not belong in geoscience departments
3. **Geoscience education is a second rate research activity**

Vicious circle!!



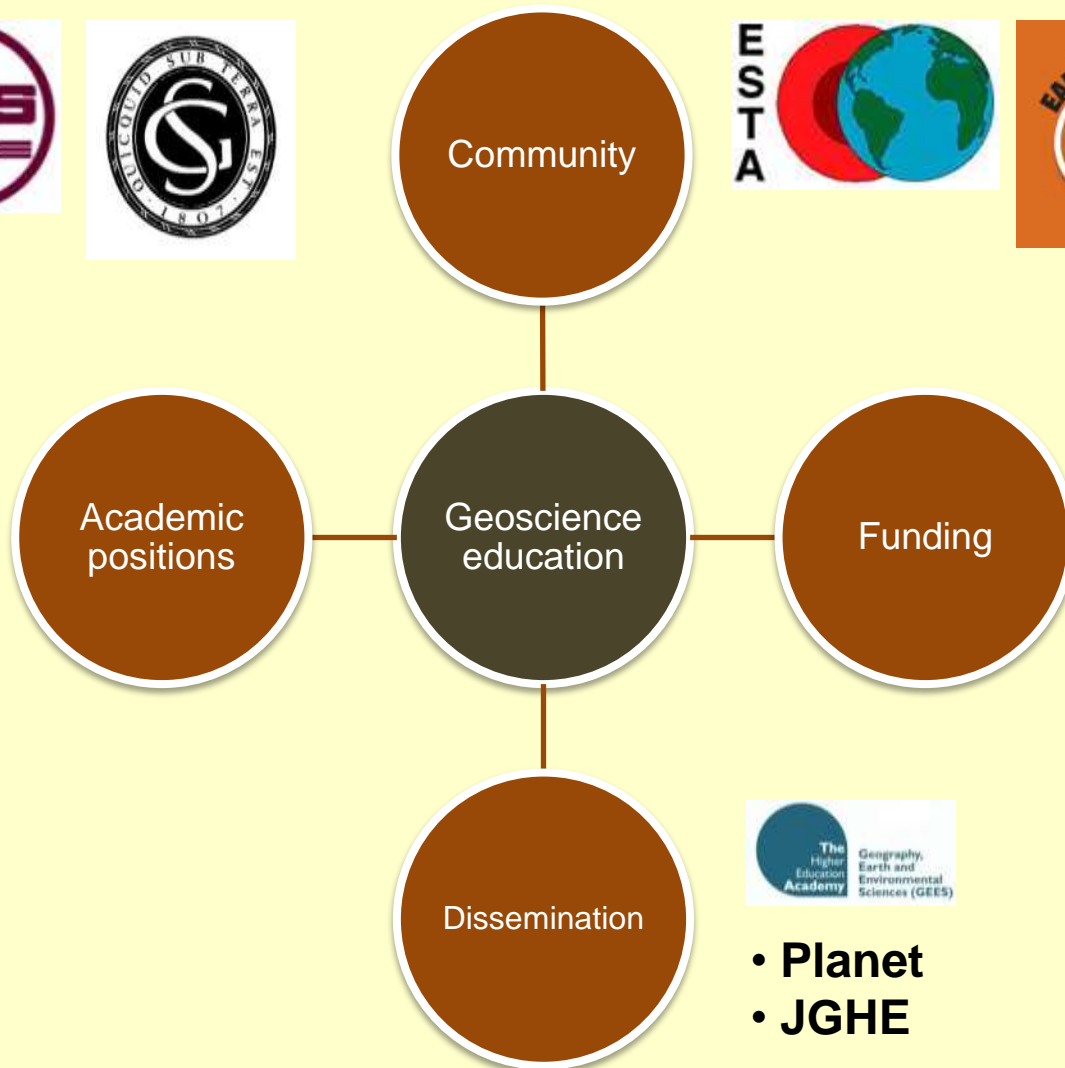
Geoscience education / geocognition research in the US



Geoscience education / geocognition research in the UK



X



?



- Planet
- JGHE

Is there a future for geocognition research in the UK?

STRENGTHS

- Existing expertise and innovation in geoscience learning and teaching
- Fledgling community (e.g. Geol Soc SIG)

OPPORTUNITIES

- Profile for geocognition still relatively low throughout Europe – opportunity for UK to blaze the trail?
- Opportunities for international collaboration (especially with the US)

WEAKNESSES

- Not recognised or encouraged as a scholarly pursuit
- Requires engaging with new research methods and literature

THREATS

- Vicious circle remains intact!
- Rise in tuition fees – not perceived as a necessity or priority

Where do we go from here?

- The impact of geoscience education and geocognition research extends beyond simply educating and training geoscientists
 - Enhancing teaching and learning in the geosciences
 - Informing student recruitment (onto geoscience programmes)
 - Raising public awareness of geoscience
 - Understanding and influencing policy makers

BUT:

- How can the profile of geoscience education and geocognition research be raised within the UK?
- What should be the role of:
 - Individual schools / departments
 - National organisations (e.g. Geol Soc, BGS, GEES Subject Centre)
 - Industry?

