Applying pedagogies to wicked problems in Geography

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Structure of talk

- Define wicked problems
- Examples of wicked problems
- What makes wicked problems difficult to (a) research and (b) teach?
- What are the opportunities and challenges to staff and students undertaking research and/or teaching?
- Translating research to pedagogies for wicked problems
- New positionality for Geography?
  - Inter-disciplinary collaboration
  - Liberalisation of the university curriculum
  - Communities of practice
- Encouraging creativity and imagination is the new (existing?) geography!

Defining wicked problems

*"A class of problems that are **complex**, **contentious**, **defy complete definition and resolution**, and for which there is **no single solution**, since **any resolution generates further issues**." (Rittel & Webber , 1973, p.4)*

*"… such problems are **not morally wicked**, but **diabolical** in that they resist all the usual attempts to resolve them." (Rittel & Webber , 1973, p.4)*

*"Are characterised by high degrees of **scientific uncertainty** and **lack of consensus**, for which there are currently **no correct or optimal solutions**, but which require planners and politicians to make decisions." (Brown et al., 2010)*

*"Those resistant to resolution because of **incomplete, contradictory, and changing requirements**. Surrounding demands are often difficult to recognize; moreover, because of **complex interdependencies**, the effort to solve one aspect of a wicked problem may **reveal or create other problems**." (Langellier, 2013)*

*"Wicked problems have no technical solution, it is **not clear when they are solved**, and they have **no right or wrong solution** that may be determined scientifically. Instead, for wicked problems governance must rely on the **collective judgment of stakeholders** involved in a process that is **experiential, interactive and deliberative**." (Jentoft & Chuenpagdee, 2009, p.553)*

Examples of wicked problems

- Climate change
- Global poverty
- Food insecurity
- Biofuels
- Space junk in orbit
- Plastics littering oceans
- Overfishing
- Coral reef decline
- Urban inequality
- Global terrorism
- Sustainable futures
- Troubled families
- Provision of rural schools
- Housing markets in impoverished areas

"Since wicked problems are part of the society that generates them, any resolution brings with it changes in that society." (Brown *et al*., 2010, p.4)

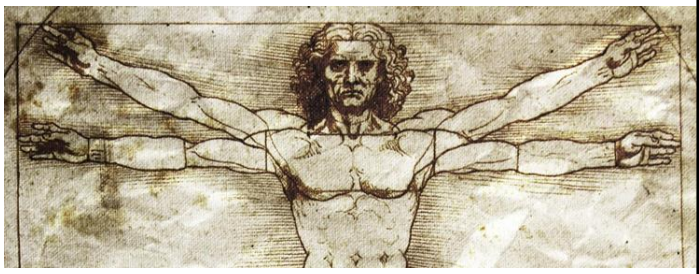
The properties of wicked problems

(adapted from Duckett et al., 2016; Rittel & Webber, 1973; Jordan et al., 2014)

1. Indefinable (and non-generalizable)
2. Ambigously bounded
3. Temporally exacting
4. Repercussive
5. Doubly hermeneutic
6. Morally consequential

Applying to and facilitating research

(Brown et al., 2010; Jordan et al., 2014)



- Collaboration between different researchers
- Integration of stakeholders
- Different ways of thinking
- Using imagination, creativity
- Be receptive to new ideas and new directions
- Exploring all investigative avenues
- Respect other ways in which we construct knowledge
- Drawing upon others' intellectual resources
- Overcoming academic silo mentality, crossing disciplines
- Overcoming communication issues associated with idiosyncratic technical language and practices
- Often adopt holistic perspective
- *Multi-disciplinary* versus *inter-disciplinary* versus *trans-disciplinary*
- Open, transdisciplinary modes of inquiry

Translating research to effective pedagogy (1)

What skills do we need our students to develop?

- Openness of dialogue with others from outside your subject area
- To acknowledge and empathise with different perspectives
- To utilise different knowledges and technical skills
- To be able to handle complexity and uncertainty
- To be resilient when faced with setbacks and obstacles that inevitably arise
- To stimulate imagination and creative thinking

Translating research to effective pedagogy (2)

Opportunities and challenges

- The practicalities of translating research into effective teaching
- Facilitation of small, multi- or trans-disciplinary teams, tapping into diverse expertise
- Using multiple methodologies in teaching
- Using effective learning and teaching approaches
- Inter-disciplinary collaboration between university departments
- Stimulating imaginations, creativity and critical thinking

Translating research to effective pedagogy (3)

1. **Research-informed teaching**
2. **Using case studies** (Davidson & Lyth, 2012)
3. **Inquiry- and problem-based learning** (*Brown, 2010; Davidson & Lyth, 2012)*
4. **Adaptive learning and self-reflection,** e.g. learning journals (*Davidson & Lyth, 2012)*
5. **Transformative learning theory** *(Haigh, 2014)*
6. **Transdisciplinary team formation** *(Norris et al., 2016)*
7. **Problem-exploring through team practice,** e.g. video production (*Van Kooten & Berkley, 2016)*
8. **Engaged scholarship, working with stakeholders** *(Dentoni & Bitzer, 2015; Paynter, 2014)*
9. **Service-based learning** *(Cantor et al., 2015)*

Teaching example: '*Climate Change & Sustainability*' at Bath Spa University

Remit:

- *Either:* Write a consultancy report that outlines the likely impacts of climate change on the Somerset Levels.
- *Or:* Write a report for Bath and North East Somerset Council outlining potential climate change mitigation options that a named city of Bath could pursue over the next twenty years.

L&T strategy:

- Self-selected groups of 4 students; group report of 2,000-2,500 words; supported by informal workshops and field day (Somerset Levels); peer assessment element

Assessment criteria:

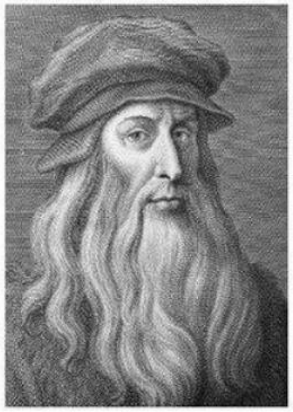
1. clear conceptual understanding social, economic, and policy implications of climate change.
2. ability to appraise and assess appropriate scientific, social scientific and/or policy literature, and clearly communicate its findings/results.
3. clear and succinct report written in accessible language, appropriate to the target audience.

Issues of inquiry-based approach

- Establishing multi-disciplinary teams
- Group dynamics
- Compartmentalisation of writing
- Limited collaborative discussion and editing
- Is transdisciplinarity attainable? Not sufficiently diverse subjects
- Lack of technicality or discursive application
- Superficiality in critique and evaluation of options
- Lack of basic global awareness, poor geographical knowledge
- Need to better engage in wider reading and to learn to critically analyse sources
- Too challenging for Level 5 (Year 2)?
- But better-performing groups show creativity and critique

The positionality of Geography

- Administrative reorganisation of Geography (Hall *et al*., 2015)
- Integration of physical and social sciences
- Evolution into Liberal Arts?
- What role should Geography play?
- Evolving communities of practice – research impact
- ‘Graduateness’ and employability - training of future decision-makers
- Engaged scholarship combines the work of universities with that of community partners (Paynter, 2014)



To develop a complete mind:
Study the science of art;
Study the art of science.
Learn how to see.
Realize that everything connects to everything else.

– leonardo da vinci

Example: Sustainability in Life and Work – Open Module at Bath Spa University

(adapted from: Mears, R., Wiffen, C. & Schaaf, R., 2016, Introduction to open and shared modules, presented at Staff Development Day, Bath Spa University: 5th July 2016)

- A thematic, multi-disciplinary module exploring sustainability from numerous subject and policy positions
- Example topics:
  - Climate Change; Managing an EcoCampus; Corporate social responsibility; Happiness agenda; Ethics and justice; Waste management; Biodiversity and ecosystems; Sustainability and heritage; Sustainability in Shakespeare's worlds; Environmental citizenship
- Assessment:
  - Multiple-choice tests (30%)
  - Creative project (artefact and summary) (40%)
  - Group presentation (30%)

Conclusions

- Geography is no stranger to researching and teaching wicked' problems and nexus thinking.
- The diversity of skills and knowledge possessed by geographers means they are well placed to contribute to wicked problems.
- Our institutions/curricula are increasingly requiring that students are able to deal with wicked problems.
- Maintaining a balance between (technical) specialization and open critical inquiry.
- Enabling and making our students aware of their skills (employability and 'graduateness').
- Geography is in a good position to make important contributions to multi- /inter-disciplinary research and teaching, and to the liberalisation of curricula.

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