

Project

CCP_Law - Curricula Development on Climate Change Policy and Law

Project No. 618874-EPP-1-2020-1-VN-EPPKA2-CBHE-JP

Deliverable 1.2 Best Practice report on Climate Change Educational Methodologies

Document Details

Title	Report
Work Package	WP 1 Preparation
Nature	Report on Climate Change Best Educational Methodologies Practices
Original Completion Date	
Actual Completion Date	25 May 2022
Dissemination Level	Public
Country	Greece/Spain/UK
Prepared by	Coventry University

Revision History

Version	Date	Author	Description/Comments
Version 1	19/05/2022	Coventry University	

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Teaching climate change and climate change law/policy.

A desk based study of best practice in the teaching of climate change and climate change law was undertaken using Google Scholar. Search terms (permutations of): “Higher education”; teaching; learning; pedagogy; “climate change” “climate change law”; “environmental law”. Plus articles identified as potentially relevant in the citations of the initial search. The search was initially limited to articles published after 2015, but additional useful articles have been reviewed and included if they appeared in the reference list of the initial search.

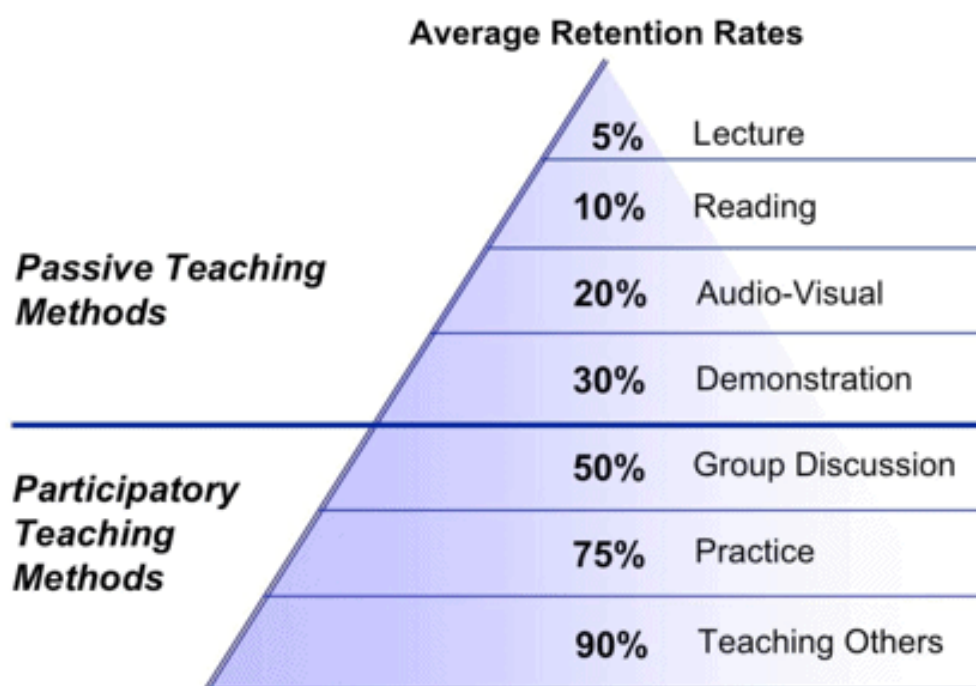
Only articles published in English were considered. No restriction placed on geographic or subject area.

Principles of Pedagogy

Teaching which is student-centred, active, applied, inclusive and research informed, which builds digital fluency, innovation, creativity and embeds employability.

Postgraduate study should develop the skills that students already possess and develop critical thinking (Reissner & Watson 2014). Student-centred learning in contrast with teacher-directed and transmission-based learning (Hake, 1998, Neumann, 2013; Tangney, 2014) emphasises active learner engagement and deep learning (Cannon & Newbie, 2000; Howland, Jonassen, & Marra, 2013; Lea, Stephenson, & Troy, 2003). Numerous studies show that traditional didactic lectures are an in-effective way to help students retain material. The National Training Laboratory Institute of Applied Behavioural Science Learning Pyramid shows that passive teaching methods are significantly less effective than participatory methods (see Figure 1, below). There has been some criticism of legal education for not adequately preparing graduates to apply their knowledge in a professional context (Stuckley et al, 2007; Sullivan et al, 2007). However, the level of retention may depend upon the learning style of the student, or the topic. In some instances, reading may be more effective than group based discussion. Therefore integrating traditional methods of teaching with pre/post class reading and inclusion of group discussion, reflection, feedback and other methods of social learning is likely to better facilitate learning and improve application of knowledge.

Figure 1. National Training Laboratory Institute of Applied Behavioural Science Learning Pyramid



Young People and Climate Change

In a survey of c. 10,000 young people (16-25) across 10 countries from global north and south Hickman et al (2021) find that there are high levels of eco-anxiety/climate anxiety. Young people are deeply concerned about the future impact of climate change, they feel let down by government and older generations for failure to deal with climate change and feel a sense of guilt over their role in climate change.

There is therefore a role for academics to create a space to teach the topic but also to create a safe space where students can communicate their fear, help alleviate their stress and but also to discuss what they think the solutions might be professional and personally, particularly as young people are often cited for their over-consumption. Indeed Bergdahl and Langmann (2022) discuss the urgent need for education on climate change, but to do so in a way that is positively framed.

Teaching Climate Change

A number of studies show that climate change education facilitates community and institutional transformation in both adaptation and mitigation through pro-environmental behaviour. Filho et al (2021) conclude that universities need to develop climate change education through a cross-cutting emphasis to climate change, across courses and disciplines. They posit that a silo-based approach is no longer acceptable. They also advocate that both climate change adaptation and mitigation should be included in curricula.

Monroe et al (2019) suggest that the teaching of climate change should therefore be:

- Personally relevant & meaningful and connects to their local community/university
 - Making the issues relevant to learners. Climate change is typically considered challenging to understand as its effects are not always felt in the same spatial or temporal domain as the learner. Getting students to discuss and share what their personal experiences are can help make it more relevant and tangible.
- Engaging teaching methods
 - Ensuring that mixed methods are used to teach and that there are opportunities for all learning styles to be accommodated.
- Engaging, deliberative discussion
 - Through a robust debate, students can begin assessing the risks and benefits of different strategies for mitigating or adapting to climate change, understand different perspectives and the value of different approaches. This facilitates learning from one another.
- Experience the scientific process
 - Participating in scientific enquiry can support better connection to and engagement with the output.
 - E.g exploring via Google Earth climate impacts such as glacial retreat.
- Addresses misconceptions
 - Giving students opportunities to discuss, explore and adapt their own personal views/beliefs based on reasoned, evidenced argument.
 - E.g. that ozone depletion and climate change, while both part of the atmospheric system are not caused by the same process and do not have the same impacts.

Junker, (2011) and Hammer, (1999) discusses the importance of integrating interdisciplinary thinking into the teaching of climate change and environmental law. The latter study reported the use of small groups to explore a topic (e.g. environmental ethics in allowing more mining) and presentation of overall position to the class and subsequent response to feedback. This facilitated a critical examination of the issues arising from the scenario and required students to make reference to the scientific factors, ethical issues, socio-political aspects and relevant legal regime governing the facts.

Rather than simply exploring this from the perspective of the regulation this forced students to discuss and consider the other issues at play in developing and enforcing the law. This led to a deeper, more critical and more applied understanding of the subject and its issues.

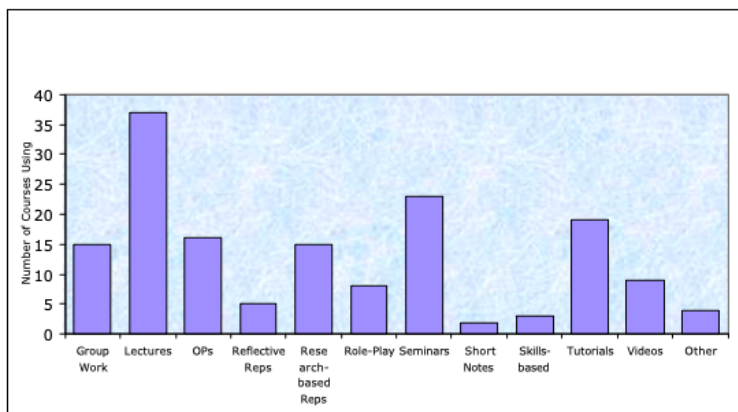
Commenting on the role of interdisciplinarity in environmental law, a group of scholars has suggested a need for 'interactional expertise' in other disciplines so that environmental law is grounded in a solid understanding of the underlying physical and socioeconomic challenges. Beyond mere interdisciplinarity, they propose a 'transdisciplinary' approach, described as a new intellectual paradigm characterised by a 'meta-language in which the terms of all the participants' languages are, or can be, expressed' (Mehling et al. 2020)

Teaching & Learning in Environmental & Climate Change Law

Bell et al (2003) identified that traditional lectures were still a significant part of a legal education (See Fig. 2). Role play was one of the less used approaches but was looked upon positively by respondents: "Those kinds of tasks (group work and role play) are particularly useful in order to make those regulatory procedural issues palatable. In role play about contaminated land, for example, we appoint one group as the regulator, one group as the owners or occupiers of contaminated land and one group as the contaminators. They are posed with the problem and each group is asked what they are going to do, who are you going to talk to etc. In this way I'm trying to make it a little more lively". Role play got the best response from students. In-class discussion (Socratic method) was also popular with respondents as they felt that it helped explore the complexity in more detail and improve retention among students.

Figure 2. UKCLE Law Subject Survey in Environmental Law, range of teaching and learning methods used in UK HEIs (Bell et al, 2003)

Fig 8.9 –Teaching and Learning Methods Used



From a USA perspective Robertson (2021) identifies common threads in environmental law as, which are equally applicable to climate change law:

- Policy-making and prioritization – what is local, state, national, regional international law and policy and how well is it integrated into other, non-climate related policy and legislation
- History of development of legislation
 - Use of Wild law to assess cases and/or redesign law.
- Economics – of environmental/climate decision making and the cost of regulation, the internal and external costs of pollution from both an economic and social perspective
- Climate
- Environmental justice – or climate change justice – un-equal impact of climate change on minority and low income groups/communities .

- Politics – review at all scales the opposing views, positions and approaches to both mitigation and adaptation
- Interaction between laws - state vs federal, national vs local, international vs national.

Roberston (2021) goes on to identify some approaches to dealing with and teaching these topics.

- Review of statutes
- Requires discussion of the complexity, ambiguity and fast paced development of the body of law
- Need for a cross-disciplinary approach – you don't need to be a climate scientist, but you need to know who to ask for help and how to interpret or question the information
- Case method – show what the law is, what decision was made and why, how this might relate to precedent
- Case against the case
- In-class discussion
 - What are the climate change issues in your area?
 - How do these relate to local/national policy
 - How should these issues be priorities (linked to the community)
- Role play on human behaviour – This uses the principle of tragedy of the commons, a similar approach could be used in relation to emissions and/or the COP process.
- Case study review and discussion either based on personal perspective or sourced from another law school (e.g. sourced from London School of Economics¹, Colombia Law School² or Stanford Law School³)
 - Used to discuss how different governments approach the same principles
 - Discuss how different judgements are made
- Research workshops
- Practice experience
 - Moot court practice.
 - Using case law and role play to re-enact a hearing/prosecution of a breach of environmental law. Where groups of individuals prepare a prosecution or a defence of the case, other groups or individuals play the roles of expert witnesses, the jury and/or the judge.
 - This could be developed into competition such as that held by the PACE law School in the USA (see Case, 2020) but the process is widely viewed as an interactive and beneficial way of supporting student learning (see Case, 2012 and citations therein)
 - Law clinics
- Interdisciplinary workshops
- Use of current examples/events

Giraudou, (2021) offers a similar assessment based on one PG course “Law and the Environment”, delivered in English, to a mixed classroom composed of Japanese and international students enrolled on programmes in either the Environmental Sciences or the Humanities & Social Sciences. The course/module focusses on climate change litigation. Initially introduces the key components of litigation then students are engaged through discussion on relevant case law. Cases are selected by the instructor, and occasionally chosen by the students, mainly from the Colombia Law School Climate Change Litigation Database, which covers US and Global cases.

¹ https://climate-laws.org/litigation_cases

² [Sabin Center for Climate Change Law](#)

³ <https://law.stanford.edu/environmental-and-natural-resources-law-policy-program-enrlp/case-studies/>

The cases discussed in the classroom cover issues such as proactive and anti-regulatory litigation as well as mitigation-related and adaptation-related litigation

Four types of actions are addressed: actions against governmental entities for acts or omissions relating to greenhouse gas emissions;

- actions against governmental entities to force procedural consideration of anthropocentric global warming and associated climate change impacts;
- civil lawsuits against private entities considered as directly responsible for greenhouse gas emissions; and
- actions against governmental entities regulating greenhouse gas emissions by those adversely affected by such regulation

Students reflect on the cases from two perspectives. First, students draw from Science and Technology Studies (STS) to discuss the role of climate change science in forming and enacting the law. Secondly exploring the challenge from a legal perspective of relying on “restrictive, human-centred terminologies, legal principles and courtroom settings to challenge the legally enshrined human/nature divide” (p13). The approach explores the law through “wild law judgments” where judgements are rewritten or a hypothetical, futuristic judgement is taken. The approach taken by such project is to ‘wildly’ ignore, discard or reshape existing laws based upon creative suggestions for statutory reform, questioning the dominant anthropocentric principles that underpin the existing law and incorporate in their judgements some of the key principles of the emerging wild law movement. Through this process students come to question and challenge “non-earth-centred” law and whether it is adequate or inadequate from a range of perspectives.

Humby (2017) discusses the importance of decolonising the curriculum and using environmental justice as a lens with which to view law. This is a wider discourse on the history, causes, consequences and need for justice and decolonisation. But no examples of how to do this in teaching are provided.

Holder (2013) also explores the importance of employing concepts of Wild Law and Earth Jurisprudence. Based on the argument that current conceptions of rights and justice in law and legal education are overly narrow and restrictive and that it may be better to align with environmental education theories of ecological intelligence. Holder highlights the importance of ensuring students recognise the importance of the subject and what is at stake. Literature reviewed makes a strong case for using environmental values and ethics on the state of the environment to shape legal education. He advocates two approaches:

- 1) Using the university’s position in the community to create opportunities for collaboration such as advocacy for local environmental groups (which may simply be researching and finding resources for these groups), participating in research.
- 2) Wild Law/Earth Jurisprudence – “an emerging, non-anthropocentric, paradigm embracing the idea of nature’s own rights, and recognizing the intrinsic rather than functional value of the natural world.
 - a. Earth Jurisprudence, based on the idea that humans are only one part of a wider community of beings and that the welfare of each member of that community is dependent on the welfare of the Earth as a whole.

Robinson-Dorn (2007) uses a range of interactive, participatory approaches to the teaching of environmental law:

- Case law to analyse/critique the strengths weaknesses of decisions and arguments, this requires consideration of the precedents, politics, policy and existing law/doctrine.
- Research the case – analysing in detail the evidence, the case presented.

- Deep dive seminars – discussion of the law via a specific geographic area, ecosystem, species and addressing the legislative, social and environmental issues associated with this. Rather than via a statute or individual case. Using specialists from those areas to support the seminar, not just law school staff.
For example of cross-disciplinary integrated seminars that can be developed around a very broad theme e.g. “Trees”. The idea is to introduce students (expected to be of both legal and non-legal background) to climate change law issues. Rather than attempting to immediately apply the black letter legal rules, students are encouraged to “deep dive” into an issue and develop understanding of the many and varied interests and aspects surrounding the resources, geographical region, or ecosystem. For example with theme such as “Trees” apart from looking into the relevant legal framework there are other narratives to be explored such as the historical, cultural, economic and scientific. The seminar can expand to matters such as forest health, biodiversity, endangered species, land use and zoning, urban development etc. In turn, that will uncover the complexity of various applicable laws, stakeholders involved and the role that science and politics play. It is expected that these seminars will engage and involve colleagues from other disciplines as well as legal specialists that can discuss their own litigation experiences.
- Role play/Case studies and simulation – e.g. using [the Stanford Law School database](#). Where Students are assigned to be either the legal, scientific, or community representatives of the residents or the staff from the administrative agency. They submit trial briefs and present oral testimony and arguments. Yields good student engagement.
- Clinics – students used on real cases, under staff supervision.
- Provides a critique of and rebuttal to the methods. Main challenge is that these methods all require small class sizes – which may not be feasible depending on the Law School’s resource.

Poustie (2001) also advocates the use of role play. In their study students acted as either state or NGO delegations on the basis of the real positions groups would have held. The law content was supported by online-learning (1) asynchronous learning—particularly negotiation and the development of negotiation skills; (2) the provision of ready access to a range of conference documentation and learning materials; and (3) just-in-time access to documentation such as updated versions of the draft treaty as negotiations progressed.

Role play and small group discussion are also advocated by Boer (2021) as a way of encouraging students to discuss, articulate and report their ideas and findings as well as increasing their confidence speaking in public. The process is more collaborative, active and motivating. It also encourages students to teach one another, notes as in Fig. 1 as an active participatory way of teaching. Kang (2012) also suggests that this method can also be used to maximise meaningful participation.

Theissen (n.d.) presents a role play activity to help students understand the development of climate change policy⁴. The activity is aimed at geoscience students, and is intended to be carried out at the end of a module on climate science as a way of bringing together the debate and discussion on climate change. However, as the purpose is for students to understand the complexity of politics and policy making this could be transferable to a climate change law/policy module. The module also aims to develop students problem solving, communication and collaborative skills, which are vital to the legal profession. The activity runs a UNFCCC style Conference of Parties, where 2-3 students are assigned as delegates to specific roles in a US context e.g. a US congress sub-committee, a fossil fuel lobby, an Environmental NGO. This would also work by assigning small groups to different UN

⁴ <https://serc.carleton.edu/sp/library/roleplaying/examples/34147.html>

countries, or groups of countries, such as the USA, Russia, Small Island States, Nigeria, China. The point being that some countries/parties strongly advocate for rapid and substantial action, while others lobby for, and may veto and GHG mitigation action in order maintain economic development.

In their assigned groups students are asked to consider a resolution to reduce GHG emissions, provided by the tutor before class. They are directed to consider the environmental, social and economic costs of action and in-action. Each group is required to research and present a position paper that outlines how they intend to vote, why they intend to vote in this way giving three well evidenced reasons to support the position. Other groups may then question or challenge the presentation. The aim of the presentation is to attempt to sway others with a well-reasoned and supported argument. At the conclusion of the convention students vote for one of the following three options; each delegation should vote for: 1. Acceptance of the resolution 2. Amendment of the resolution; at different specified emission reductions. 3. Rejection of the resolution. Assessment for this task was based on the presentation and individual contribution to the presentation. This could be supplemented by individual reflection on the role of politics and power in the development of policy.

Sax (1989) employs an explorative case study approach to role play, encouraging students to explore the limitations of the legal system and engage in ongoing cases during a semester long case study. The example students were given looks at efforts made to control the discharge of toxic metals waste from the Chevron Refinery in California, students were encouraged to interact with stakeholders in the legal battle while completing the assigned written exercises. Sax employs this method to give students a wider picture over the impact such events can have on the ecosystem and describes the pedagogical approach as allowing students to have a immersive experience into one area of environmental law rather than trying to cover every substantive area.

Almost all of the authors cited above also note that these active methods of teaching need to be supplemented by some traditional lecturing and/or with pre-class reading and preparation.

Reflection is used by a number of studies to embed learning, show application of learning. Poustie (2001) assessed by a reflective report to assess what they had learned from the process in terms of legal understanding, negotiating issues and team-working. Other authors advocate shorter reflective, formative work such as One-Minute Essays⁵ (Bach, 2021), the author notes that it is helpful to provide specific questions for the student to address such as what did I learn, what do I still need to address/have questions about, what was most useful about today's class, what relationships do you see between today's class and your practice.

Group working methodology must be discussed, exploring team roles and practices through the lens of environmental law. Belbin team assessment can be used throughout the group exercises to explore strengths and weaknesses, potential contributions and duplication or absence of skills. Belbin offers an exercise to define roles and skills through the team roles circle, shown in Figure 3 below

Figure 3. Belbin's Team Roles

⁵ <https://oncourseworkshop.com/self-awareness/one-minute-paper/>



Legal, Research and Academic Writing Skills

Guilbert, Lane and van Bergen (2016) state that engagement in research can benefit students through develop of their ability to interpreting the research of others, take ownership of their learning, may lead to a deeper interest in, and understanding of, subject material and lead to improvements in student self-efficacy (see citations therein).

As shown in the desk-based study many of the environmental law programmes contain legal skills either as modules in their own right or as skills integrated into other taught modules. All programmes included a research dissertation. Legal and environmental professionals value the transferrable skills that a research dissertation provides. However student engagement with the teaching of research skills is often low.

Fallon, Prendergast and Walsh (2012) propose the use of activity-led learning in a group environment as a way of improving student engagement in a research skills module. The module focussed on qualitative and quantitative research methods and had three distinct elements: designing activities/tasks, designing and undertaking an engagement survey and finally addressing the issue of assessing students in a group-based environment. It encouraged student participation, via the used of activities, including workshops, brainstorming, mind-mapping, presentations, written submissions, peer critiquing, lecture/seminar, “speed dating” with more senior students, and self-reflection. Student feedback on these sessions was very positive, stating that it was “fun”, created a positive learning environment and that they were comfortable to make a contribution. Activities included designing and testing interview and questionnaire questions and analysing past research proposals. The key point of this study is that rather than a traditional didactic lecture on research skills these can be developed and tested by providing pre/post-class reading and then getting students to practice the methods in a safe and inclusive environment.

Summary

The academic and legal literature highlights the value of active, participatory and student centred learning. This should be supplement by some traditional didactic lecturing, but the pedagogic approach should include a mixture of teaching and learning methods regardless of subject matter to develop students transferable skills and be inclusive of a range of learning styles.

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