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TOWARDS A BLUE PEDAGOGY

Teaching and the Blue Humanities



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The ocean occupies a paradoxical position in higher education: while it remains central to urgent climate discourse, it is often restricted to siloed, fragmented disciplinary approaches.¹ The Blue Humanities offer a corrective to this isolation, reframing the ocean as a multidimensional nexus (simultaneously a historical archive, a living environment, and a contested political space) that transcends traditional academic boundaries. Higher education can engage more effectively with the UN Ocean Decade through such an interdisciplinary approach as Blue Humanities.²

At the Sorbonne, we have explored this theoretical potential for integrating diverse epistemologies in the course “Chemistry and Blue Humanities: Perspectives on the Ocean”, offered in autumn 2025 by chemists Geoffroy Guillemot, Benoît Fleury, and Natasha Krins, together with myself (who is a specialist in Scandinavian literature). This essay attempts aims to describe the course and examine the pedagogical and epistemological considerations that informed its design.

By leveraging the fluid nature of marine environments as an organizing principle, this pedagogical experiment moves beyond traditional anthropocentric instruction to foster a more relational understanding of aquatic ecosystems.³ This initiative demonstrates how bridging materialist scientific practices with humanities-based inquiries can dismantle narrow disciplinary silos, effectively “oceanizing” education by embedding students within the messy, multispecies realities of coastal and maritime existence.⁴ Such an approach necessitates an epistemic shift, moving from static pedagogical models toward dynamic frameworks that recognize the ocean as both a source of knowledge and an active partner in the learning process.⁵

By operationalizing the ocean as both a material medium and an epistemic partner, this shift encourages students to reconsider the fluidity of marine environments as fundamental to their own research methodologies.⁶ This transition from an objectified subject of study to a collaborative pedagogical agent facilitates what Astrida Neimanis terms “thinking with water”, a process that bridges the gap between scientific mediation and posthumanistic and feminist engagement.⁷

“Chemistry and Blue Humanities”, an educational experiment

The experiment conducted at Sorbonne University as part of the course “Chemistry and Blue Humanities: Perspectives on the Ocean” in the first semester of the 2025–2026 academic year is a concrete test of blue pedagogy, understood as pedagogy of the environment. The course brought together thirty-two students from the bachelor’s degree in Chemistry and the bachelor’s degree in Nordic Studies, paired in transdisciplinary teams in order to confront, in practice, heterogeneous knowledge systems.

The teaching method engaged students in learning situations where scientific understanding, cultural interpretation and sensory experience were constructed jointly. Working in pairs was at the heart of the programme: by pairing a science student with a humanities student, the course created a space for translation and negotiation of knowledge, where chemical concepts related to marine environments (industrial pollutants, heavy metals, hydrocarbons, and physical-chemical transformations) entered into dialogue with tales of exploration, oceanic imagery, and literary representations of the ocean.

This dialogue took the form of a logbook produced collectively by the students, designed as a shared space for thought, where data, hypotheses, observations, readings and doubts were recorded. The core of the logbook was fed by cross-readings of scientific and literary texts on a subject chosen by the students (deep sea mining; ocean acidification; water, the origin of life; the sea; plastic pollution; etc.). It also included poems written by the students during a poetry writing workshop in which they composed haikus, before offering a reflective analysis of them. This back-and-forth between writing

and analysis recorded in the logbook made it possible to articulate sensory attentiveness with conceptual elaboration, using different genres and modes of discourse (scientific, journalistic, literary, artistic, cinematographic, etc.) as a tool for interpreting the environment in response to the complexity of contemporary ocean issues.

Teaching about the oceans therefore requires a shift in pedagogy: it is not just a question of teaching *about* the ocean, but of teaching *with* it. Viewing the ocean both as an object of knowledge and as an educational partner opens up new perspectives for teaching and transmitting marine knowledge. This approach encourages the design of transdisciplinary courses at the intersection of science and humanities, where immersion, fieldwork and physical engagement become complementary vectors for the acquisition of knowledge in skills learning. Blue pedagogy recognises the instability, fluidity and relationality inherent in the ocean environment and makes them the organising principles of learning.

The sea as a pedagogy of imbalance

In Michel Serres' philosophy, the sea is neither a backdrop nor an abstract metaphor: it is an environment that teaches, a space where knowledge arises from loss of balance and exposure of the body to its environment. Serres asserts that contemporary intellectual training requires a dual learning process: "Today's educated person must learn two languages: that of the exact sciences and that of the humanities."⁸ This requirement for scientific bilingualism finds in the maritime experience a privileged terrain where knowledge progresses through bifurcations, detours and translations between heterogeneous languages.⁹ It is no coincidence that Serres chooses specifically a maritime passage, the Northwest Passage, to illustrate this narrow and difficult-to-navigate path that lies at the intersection of the sciences and the humanities.¹⁰

More specifically, Serres contrasts settled, stable, continental thinking with the swimmer's experience. As a philosopher, he asserts in a provocative tone: "I swim, therefore I am".¹¹ This reversal of the Cartesian cogito engages another conception of thought. Thinking is no longer standing outside the world, but being immersed in it,

literally. The swimmer does not think about the sea, but in the sea, from an unbalanced body, an unstable environment and continuous attention to the surrounding forces. Learning can be thought of as a journey, during which the subject must accept being transformed by what they encounter: "To learn is to mingle".¹² The aquatic body is no longer a subject facing an object because it "mingles with the world" in a movement where "the world mingles with the body".¹³ This formulation allows us to think of non-sovereign knowledge, relational thinking and knowledge produced in instability. The surfer exemplifies this logic: he does not command the wave, does not represent it, but composes with it, in an ever-precarious balance. Some surfers go so far as to claim that it is the wave that chooses them.

Understood in this way, the sea teaches not through the stability of forms, but through the exposure of the body to an unstable environment. Swimmers, divers and surfers think with the water, in a relational, rhythmic and non-sovereign way. The body at sea learns through micro-corrections, mistakes, falls and ever-temporary regains of balance. It is in this sense that the sea invites us to learn from imbalance.

Body, fieldwork and immersion

Certain sociological approaches have shown that essential forms of knowledge cannot be acquired without a sensory and physical engagement with the worlds being studied. The sociology of "flesh and blood", developed in particular by Loïc Wacquant and Frank Adloff, emphasises that the field is not simply a place for applying theories, but a space for training the eye, judgement and ethics.¹⁴ The body is conceived as an instrument of knowledge in its own right, inseparable from the processes of learning and inquiry.

This perspective finds particular resonance in the development of blue pedagogy as a pedagogy of imbalance. The marine or coastal environment is not simply a teaching aid, but a demanding environment that requires attention, adaptation and cooperation. Immersive practices such as coastal walking, on-board observation, swimming, diving and surfing are part of a relational epistemology in which knowledge is constructed through successive adjustments to the

environment. Imbalance, far from being an obstacle, thus becomes a prerequisite for learning.

Methodologically, blue pedagogy could derive its operational framework from the five "S" properties that Loïc Wacquant proposes for his carnal sociology:

- **Sensate:** engagement of perception, affect and bodily awareness as active dimensions of inquiry, foregrounding how learning and knowing emerge through sensory immersion in and lived experience of the marine environment;
- **Suffering:** treatment of the body as a methodological instrument engaged in effort, fatigue and exposure to the variable conditions of fieldwork at sea (the cold, salt, weather and unpredictability that materially shape what can be observed, recorded and endured);
- **Skilled:** acquisition, transmission and practical application of scientific, analytical and interpretative gestures, from sampling and species identification to the tacit know-how of handling a vessel, deploying an instrument or diving in changing conditions;
- **Sedimented:** recognition that bodies, practices and knowledges are historically layered, deposited over time as the layered product of prior training, institutional routines, cultural memories and accumulated field experience that orient perception and action within a given oceanic site;¹⁵
- **Situated:** conducting research and learning in a specific oceanic location whose material, ecological and social constraints (tides, salinity, weather, coastal communities, infrastructure) are not background conditions but constitutive of the analysis.¹⁶

Applied to mechanisms such as fieldwork, for instance in oceanographic stations, participant observation, situated readings and sensory workshops, these principles structure an embodied, collective and reflexive learning methodology, articulating data production, critical analysis and theoretical development.

This concept of immersion-based learning ties in with the ideas developed by Melody Jue and Søren Frank in the context of amphibious scholarship.¹⁷ Amphibious reading practices encourage us to think of

learning as a situated experience, simultaneously engaging the body, the senses and the intellect. As Melody Jue points out, immersion transforms the very language of thought.¹⁸ From this perspective, the immersive oceanic experience becomes a privileged medium for transmission, in that it allows for the somatisation of knowledge and promotes a form of thinking-through-water, where understanding also means experiencing.

Understanding in order to inhabit: Ocean Literacy

The Ocean Literacy framework, promoted by UNESCO, defines the ocean as a global system and emphasises the importance of understanding the interdependent relationships between human societies and marine environments.¹⁹ This approach marks a major shift in ocean education: it is no longer just a matter of accumulating factual knowledge, but of developing a systemic understanding of the physical, biological and climatic processes that structure the ocean.

This perspective has led to the emergence of the Blue Curriculum, defined by UNESCO as “an innovative educational framework integrating ocean literacy into formal school curricula to deepen learners’ understanding of the ocean’s vital role”.²⁰ This term is used in a global movement promoted in particular by UNESCO’s Intergovernmental Oceanographic Commission, which encourages the cross-curricular integration of Ocean Literacy into school programmes. Initiatives such as the Blue School Global Network embody this dynamic by offering interdisciplinary projects: “The Blue School Global Network links education and the ocean through hands-on, cross-subject projects, empowering students to become engaged in building a sustainable future”.²¹ In international education frameworks, the Blue Curriculum thus refers to an educational model centred on the ocean as a space for engaged learning, linking science, culture and citizenship.

However, while UNESCO has defined Ocean Literacy principles for primary and secondary education, no equivalent structured framework yet exists for higher education. This gap will probably be partly filled by a recent initiative: the United Nations University’s (UNU) Ocean & Coasts Programme, launched in 2026 to foster interdisci-

plinary collaboration and support the advancement of sustainable ocean governance. As a critical extension of Ocean Literacy, Blue pedagogy could open up space for reflection and pedagogical experimentation at the university level and for research-based teaching in which students are engaged in inquiry, critical analysis and knowledge production in dialogue with the latest advances in scientific research. Such an educational framework is not limited to the transmission of existing knowledge, but mobilises the cultural, historical, aesthetic and political dimensions of the ocean as objects of research in their own right, promoting the articulation between science, the humanities and creative practices.

Blue pedagogy by navigation units

Blue pedagogy benefits from being organised around blocks of hermeneutic skills, referred to here as navigation units. The term is not merely metaphorical. It proposes learning as movement, adjustment and orientation in an unstable environment, in which scientific, cultural and sensory knowledge are mobilised together rather than side by side. Each unit thus pursues a logic of active transdisciplinarity: not the juxtaposition of disciplines but the exploration of their boundaries, where knowledge is enacted in concrete situations and the ocean counts as an environment to be composed with.

Navigation units do not correspond to closed content, but to the ability to act, interpret and compose with the ocean as an environment. The progression across different units moves steadily from conceptual orientation to interpretation, from interpretation to embodied experimentation, and from experimentation to professional insertion. The trajectory should mirror the way a learner gradually becomes capable of navigating: first by naming the waters, then by reading them, then by inhabiting them, and finally by contributing to the institutions that govern them.

The opening navigation unit provides the theoretical orientation required to approach the ocean as a physical, biological and cultural system. Rather than the closed chapters of a textbook, the unit is structured around thematic constellations (circulation, biodiversity, depth, coastal dynamics, maritime imaginaries) through which

students acquire the basic concepts, vocabulary and analytical methods that recur throughout the programme. The reading of scientific articles is interleaved with historical and literary accounts, cartographic exercises and field observation. The aim is not encyclopaedic coverage but the capacity to situate a phenomenon within a set of relationships.

The second navigation unit cultivates interpretive skills: reading the ocean as a space of narratives, conflicts and memories. Students work with texts, images, archives and contemporary practices to understand how the sea has been represented, appropriated and disputed. The juxtaposition of discourses (scientific, literary, political, indigenous, etc.) reveals the multiplicity of claims on the marine world and the stakes of those competing uses. The wager underlying the unit is that conflicts over resources, conservation and heritage cannot be properly adjudicated without attending to the plurality of visions they implicate.

The third navigation unit shifts learning into the realm of physical engagement. Coastal immersions, on-board surveys, walks, swims, dives and surfing practices are treated not as extracurricular activities but as learning situations in their own right. The body becomes a cognitive instrument in dialogue with the conceptual tools acquired earlier (precisely the intuition Wacquant develops for a flesh-and-blood sociology in which knowing is sedimented in a trained and situated sensorium).²² Creative workshops (for instance, artist-led walks at sea, beach and foreshore writing sessions, underwater counter-mapping workshops) extend the same logic into the realm of sensory expression, opening experimentation with forms that articulate encounters between humans and non-humans.

The final navigation unit opens the professional passage. Students complete an internship connected to their project in organisations working across scientific journalism, museums and heritage, NGOs, ministries, local authorities and international bodies, as well as in research, education and the broader blue and polar economy (from naval, aeronautical and space industries to wind power, ports and submarine cables). The unit formalises the shift from learning about the ocean to acting within the institutions that shape its trajectories.

The logbook (transdisciplinary and skills-based navigation)

Running through all four units, a logbook accompanies each student across the programme. Conceived as a structuring pedagogical tool, it adopts a methodology inspired by Design Thinking. The logbook links the different approaches to the iterative phases of empathy, definition, ideation, prototyping and evaluation, and so becomes at once a record and a working space (a place where hypotheses, experiments and learning can be documented, revised and made visible). As a localised and evolving archive, it mixes scientific writing, literary fragments, sensory narratives, diagrams, sketches and annotations without imposing a hierarchy between them, enacting in miniature the crossing of knowledge regimes that defines the whole programme. It doubles as a skills portfolio, rendering legible the progressive acquisition of cross-disciplinary competences (critical thinking, creativity, collaboration, ocean literacy, the capacity to devise appropriate responses to ecological stakes). Iteration and reflexivity are built into its very form, which means that the act of keeping it is itself part of the pedagogy. Internship notes and field feedback converge within it, and from this convergence each learner assembles an individualised professional trajectory rooted in the contemporary challenges of the ocean and the aquatic worlds.

Opening

Blue pedagogy refers to a set of emerging practices and principles that use the ocean as a learning environment. It is based on an explicit pedagogical foundation (ocean-centred teaching, a systemic approach to marine environments and an assumed link between knowledge, action and responsibility) while drawing on an implicit conceptual framework based on the idea that we learn in an environment as much as from an object, that inhabiting it is as important as mastering it, and that knowledge engages the body as much as the intellect. In this sense, blue pedagogy fits within the critical framework of the Blue Humanities, which question the cultural, political and sensitive conditions of ocean knowledge production.

This pedagogical trajectory is also characterised by the coherence between its aims and its methods. Working by project, through successive iterations, accepting imbalance and uncertainty, amounts to aligning forms of learning with the very dynamics of the ocean. Beyond the transmission of established knowledge, it is about creating situations where understanding means navigating a complex system, adjusting one's assumptions, negotiating languages and experimenting with forms of relationship with the environment.

Steve Mentz defines the Blue Humanities as "an off-shore trajectory that places cultural history in an oceanic rather than terrestrial context."²³ This formulation invites an intellectual mode of navigation understood not merely as a metaphor but as an epistemic and experiential practice, one that recognizes the ocean as an active participant in the production of imaginaries and knowledge. The off-shore trajectory is a form of philosophical navigation, as Roberto Casati describes it in *Oceano. Una navigazione filosofica* (2022): a philosophical engagement with the sea as both a material and a conceptual environment.

In many respects, Mentz's notion of an offshore trajectory resonates with Michel Serres's conceptualization of the Northwest Passage.²⁴ For Serres, the Northwest Passage is not simply a geographical route but an epistemological crossing that enables connections among disciplines, forms of knowledge, and ways of inhabiting the world. Likewise, the offshore trajectory denotes a transversal movement across environmental, scientific, cultural, and political domains, privileging circulation, translation, and encounter over fixed disciplinary or conceptual boundaries. Adopting such an offshore perspective therefore entails a significant epistemological shift. It seeks to understand both the ecological processes that shape the ocean and the conditions that make it inhabitable as a shared commons, while critically examining competing narratives, governance regimes, and the power relations that structure human engagements with the marine environment.

From this perspective, blue pedagogy aims to train agile young professionals capable of working in complex scientific, environmental or cultural contexts, as well as citizens invested with ethical responsibility, capable of handling heterogeneous discourses, assessing the

issues at stake and acting as informed mediators between knowledge, environments and public spaces, echoing UNESCO's motto "One Planet, One Ocean".²⁵

Noter

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