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REIMAGINING PHYSICAL EDUCATION FUTURES THROUGH A DESIGN THINKING SEMINAR

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ABSTRACT

In an era defined by the profound ecological and social disruptions of the Anthropocene, all educational sectors are called upon to reimagine their purpose and practice. This article reports on a novel methodological approach to this challenge within the field of Physical Education (PE). It details the design and outcomes of the AIESEP Specialist Seminar, "Future Matters," which employed a design thinking framework to move from identifying planetary crises to prototyping actionable futures for PE. The article first establishes the theoretical imperative for this work, synthesising the concepts of the "Great Acceleration" and the Planetary Boundaries framework to argue for the urgent integration of Education for Sustainability (EfS) into PE. It then provides a detailed account of the seminar's methodology, which structured an anticipatory trial around four distinct, plausible futures derived from the ADEME[1] "Transition(s) 2050" scenarios (Frugal Generation, Regional Cooperation, Green

[1] The French Environment and Energy Management Agency (*Agence française de l'environnement et de la maîtrise de l'énergie* (ADEME)) coordinates environmental protection and energy management activities under the supervision of the Ministries of Higher Education, Research and Innovation, and Ecological Transition and Solidarity. To accelerate the reduction of energy consumption, promote the introduction of renewable energy and reduce greenhouse gas emissions, the Agency collaborates with the government, businesses, communities and citizens through the following main programmes:
Green Fund - To support significant industrial investment projects with substantial positive impacts (territorial, ecological, and socio-economic), which contribute to bolstering the industrialisation of strategic value chains for ecological transition.
Circular Economy Fund – To support the implementation of waste and circular economy policy in France. Its goal is to assist local authorities and influence stakeholders' behavior through investments in sorting, recycling, valorisation facilities, and preventive actions.
Heat Fund – To develop renewable heat production facilities and district heating networks in collective housing, communities, and businesses to achieve the national target of 32% renewable energy by 2030.

Technologies, Restoration Gamble). We describe how participants used these scenarios and fictional personas to engage in a two-day design thinking "hackathon." The core of the article presents the results of this process: tangible prototypes for future PE, presented as narrative pitches. These prototypes include a community-based resource-sharing model, a collective decision-making tool for volatile environments, a transformative professional development program, and a human-centred application of low-cost technology. The discussion analyses these outcomes, highlighting emergent themes of agency, resilience, community, and critical pedagogy. We conclude that this structured, creative, and collaborative methodology offers a powerful and replicable process for educational fields to move beyond abstract critique and actively engage in the vital work of building preferable futures.

INTRODUCTION

The contemporary world is defined by a state of profound and accelerating change. We are living in the Anthropocene, a new geological epoch in which human activity has become the dominant force shaping the planet's biophysical systems (Crutzen, 2006). This era is characterised by the "Great Acceleration," a dramatic post-1950s surge in human population, economic activity, and resource consumption that has pushed multiple critical Earth systems beyond their safe operating space (Steffen et al., 2015). This planetary crisis is not an abstract future threat; it is a present reality that demands a fundamental re-evaluation of the purpose, values, and practices of all societal sectors, including education.

Within this context, the field of Physical Education (PE) finds itself at a critical juncture. Traditionally focused on motor competence, health, and sport culture, PE has often operated as if it were insulated from these larger socio-ecological challenges. However, as this article will argue, PE is not only deeply implicated in the drivers of the planetary crisis but also holds unique potential to contribute to a more sustainable and equitable future. The urgent question is no longer if PE should change, but how.

While there is a growing body of literature calling for the integration of Education for Sustainability (EfS) into PE (e.g., Baena-Morales & Gonzalez-Villora, 2023), there is a notable gap between theoretical critique and practical implementation. How can a field move from acknowledging a crisis to actively prototyping viable, alternative futures? This article reports on a novel methodological approach designed to bridge this gap. We detail the design, process, and outcomes of the AIESEP Specialist Seminar, "Future Matters: Reimagining Physical Education for a Changing World," an international gathering of scholars and practitioners in Lausanne in

France 2030 – To support and finance innovations and industrialisation, through calls for projects in the following areas: decarbonisation of industry, decarbonised hydrogen, recycling, bio-based products, decarbonisation of mobility, renewable energies, sustainable cities and wood-forestry. Managed by the General Secretariat for Investment (SGPI) on behalf of the Prime Minister, the plan is implemented by 4 operators: ADEME, the National Research Agency (ANR), Bpifrance, and the Banque des Territoires.

(The European Commission, 2025)

February 2026 that employed a structured design thinking framework to move from problem analysis to creative solution-building.

This article has a dual purpose. First, it makes the theoretical case for why such an intervention is necessary, synthesising the scientific and philosophical arguments that compel a reimagining of PE. Second, it provides a detailed empirical account of the seminar itself, presenting it as a replicable methodology (an "anticipatory trial", Chateauraynaud, 2013) for fostering creative and collaborative futures thinking in an educational field. By presenting the tangible prototypes developed by participants, we aim to demonstrate how structured, imaginative processes can unlock actionable pathways for change. We argue that such methodologies are essential if PE is to transition from a passive subject of change to an active agent in the creation of more sustainable futures.

THEORETICAL FRAMEWORK: THE IMPERATIVE FOR A TRANSFORMED PHYSICAL EDUCATION

To understand the necessity of the seminar's intervention, one must first grasp the foundations upon which it was built: the non-negotiable reality of the planetary context, the educational mandate of EfS, the unique potential of PE, and the psychological landscape of our time.

The scientific consensus is clear: human enterprise has pushed the Earth System into a new, more volatile state. The Planetary Boundaries framework identifies nine critical processes that regulate the stability of the planet (e.g., climate change, biosphere integrity) (Rockström et al., 2009). The most recent assessment indicates that six of these nine boundaries have been transgressed, placing humanity outside the "safe operating space" that has characterised the Holocene epoch (Sakschewski et al., 2025). This is the defining context for all future human activity and, therefore, for all education.

In response to this crisis, global bodies have called for a reorientation of education (UNESCO, 2020). Education for Sustainability (EfS) is an approach that aims to develop the knowledge, skills, values, and attitudes that empower learners to contribute to a more sustainable world (UNESCO, 2017). It is not a separate subject but a holistic vision for education that emphasises interdisciplinary thinking, problem-solving, critical pedagogy, and the development of core competencies such as systems thinking, anticipatory competence, and strategic competence (Rieckmann, 2018). The integration of EfS is no longer an optional add-on but a fundamental requirement for providing a relevant and responsible education in the 21st century.

PE is uniquely positioned to be a powerful vehicle for EfS. The UNESCO Kazan Action Plan (2017) explicitly links Quality Physical Education (QPE) to the achievement of the Sustainable Development Goals, but the connection is more profound than policy alignment. PE's intrinsic characteristics offer a fertile ground for the kind of transformative learning EfS requires:

- Embodied Learning: Unlike purely cognitive disciplines, PE engages the whole person in a sensitive approach—body, mind, and emotions. This embodied nature provides a

powerful medium for understanding complex concepts like interdependence and resilience in a felt, visceral way (Howell, 2021).

- Connection to Nature: PE can be a primary site for fostering a deep and respectful relationship with the natural world. By emphasizing outdoor activities and concepts like the Scandinavian Friluftsliv (open-air living), PE can help shift the dominant anthropocentric perspective to a more ecocentric one (Lefèvre et al., 2025).
- Emotional Engagement: Behavioural science demonstrates that emotion is a powerful driver of sustainable action (Brosch & Steg, 2021). The joy of movement, the challenge of skill acquisition, and the camaraderie of teamwork are emotional experiences that can foster a positive and proactive engagement with the world.
- Critical Pedagogy: The field has a rich tradition of critical pedagogy, particularly in addressing social inequalities (Kirk, 2019). This critical lens is essential for EfS, which requires students to question dominant narratives of progress and consumption and to envision more just and equitable alternatives.

THE PSYCHOLOGICAL LANDSCAPE: FROM ECO-ANXIETY TO AGENCY

Finally, any attempt to reimagine education must confront the emotional reality of the planetary crisis. Many people, particularly the young, experience “eco-anxiety”, a rational response of fear, grief, and anger to the threats we face (Hickman et al., 2021). Rather than treating this as a pathology to be neutralised, our approach reframes these emotions as vital signals that something in the future demands our attention (Chateauraynaud, 2013). The educational challenge is to channel this emotional energy into productive inquiry and action. This requires cultivating what philosopher Jonas (1984) termed an “ethic of responsibility”, a commitment to act in ways that ensure the possibility of a dignified human future. It is a call to move from a state of passive anxiety to one of active, hopeful agency.

METHODOLOGY: AN ANTICIPATORY TRIAL THROUGH DESIGN THINKING

To bridge the gap between acknowledging the crisis and generating actionable solutions, the AIESEP Specialist Seminar was structured as a two-day “anticipatory trial” grounded in a design thinking framework. Design thinking is a human-centred, iterative approach to creative problem-solving that moves through stages of empathizing, defining, ideating, prototyping, and testing (Brown, 2008). The seminar was organized around six core phases: understand, observe, define a point of view, ideate, prototype, and test, interwoven with keynote presentations (called Ignite Talks, conceptualised to spark inspiration. Our methodology streamlined and adapted these phases to address the specific challenge of reimagining the future of PE.

The process was guided by shared principles: creating a supportive and collaborative environment based on listening, respect, trust in the process, and valuing diversity; working in

a simple, clear, and mutually supportive way to address our challenges together; and consenting to the use of photographs, video, audio recordings, and other conference-related outputs.

STRUCTURING UNCERTAINTY: THE ADEME SCENARIOS

The cornerstone of the methodology was the use of scenario planning to structure the exploration of the future. Scenarios are not predictions, but plausible, coherent stories about alternative future pathways. They are tools for challenging assumptions and making more resilient decisions in the face of uncertainty (Schwartz, 1991). We used the "Transition(s) 2050" scenarios developed by the French Agency for Ecological Transition (ADEME, 2021). These four scenarios present distinct visions of a carbon-neutral society by 2050, each with different social, economic, and technological choices:

1. Frugal Generation: A future shaped by sobriety, sufficiency, and a cultural shift away from consumerism.
2. Regional Cooperation: A decentralised future where power shifts to self-sufficient, collaborative regional networks.
3. Green Technologies: A future that places its faith in technological innovation and ecological modernisation to decouple growth from impact.
4. Restoration Gamble: A world that, having been slow to act, now relies on high-risk geoengineering to repair a damaged planet.

Participants were introduced to these scenarios as "controversial devices" (ADEME, 2021), or frameworks designed to provoke debate and critical reflection rather than passive acceptance. Participants were able to choose a scenario that matched their values in terms of desirable future.

THE DESIGN THINKING PROCESS

The seminar unfolded over two days, guiding participants through a condensed design thinking cycle:

- **Day 1**: Understand, Observe and Point of View. After being introduced to the theoretical framework and the ADEME scenarios, participants chose the scenario they wished to join. Each of the four scenarios had two design teams groups. The first task was to build empathy for the inhabitants of their assigned future. This was facilitated through semantic analysis of the broad challenge, community mapping and interviewing a persona - fictional characters representing key community members i.e., the PE teachera teacher). By stepping into the shoes of these personas, participants moved from abstract concepts to concrete human challenges and aspirations. Groups then worked to define a specific problem (Point of View) being faced by the PE teacher persona

- **Day 2**: Ideate, Prototype, and Pitch. The second day was dedicated to brainsto rming solutions (ideation) and developing them into tangible concepts (prototyping). Once again teh persona and their actual problem was the focus. This practice of using fictional characters (personas) to explore possible futures is a form of design fiction (Bleecker, 2009), a creative tool that helps prototype not just products, but entire worlds. The prototypes were not expected to be polished products but rather concrete representations of an idea—a storyboard, a tool, a curriculum outline, a narrative. The process culminated in a "pitching" session, where each group had three minutes to present their prototype to the entire seminar. This final stage served as the "testing" phase, where ideas were shared and received feedback from peers.

This methodology was designed to be highly iterative, structured and creative. It provided the scaffolding (design thinking problem space and solution spaces, all linked to scenarios and personas) necessary to guide the work, while allowing ample space for in which there are multiple divergent and convergent moments, collaboration, and imaginative leaps. The goal was to create a process that was both intellectually rigorous and creatively generative.

RESULTS: A SPECTRUM OF PROTOTYPED FUTURES FOR PHYSICAL EDUCATION

The design thinking process culminated in a rich and diverse collection of prototypes, each offering a unique response to the challenges and opportunities presented by its assigned future scenario. Rather than converging on a single vision, the seminar produced a spectrum of creative interventions, reflecting the varied expertise and perspectives of the international participants. The outcomes can be broadly categorised into three overlapping areas of innovation: pedagogical and curricular transformation, systemic and professional development, and the development of tangible tools and methodologies.

One significant cluster of prototypes focused on curricular and pedagogical innovation at the grassroots level. These proposals often took the form of narrative case studies or project-based learning modules designed to be implemented directly by teachers. A common thread was the emphasis on shifting PE away from traditional, resource-intensive sports towards more sustainable, embodied, and locally relevant practices. Concepts included interdisciplinary projects that integrated skills like mechanics and sustainable transport, and curricula that leveraged community resources and knowledge to create a more inclusive and low-impact PE ecosystem. These prototypes championed a bottom-up approach, demonstrating how individual teachers and schools could enact meaningful change even in the face of systemic inertia.

A second category of prototypes addressed systemic change through policy and professional development. Recognising that grassroots efforts can be constrained by larger structures, these proposals targeted the systems that shape teacher practice. One powerful concept, presented through a compelling storytelling metaphor, argued for the necessity of disruptive, immersive

professional development. It proposed a mandatory, long-term exchange program that would remove teachers from their familiar contexts, forcing them to confront their biases, develop intercultural empathy, and broaden their pedagogical horizons. Such proposals highlighted the need for institutional commitment to foster the deep, reflective, and adaptive capacity required of educators in a rapidly changing world.

Finally, several groups developed tangible tools and methodologies designed to empower both teachers and students. These prototypes were not abstract ideas but concrete instruments for navigating the complexities of their future scenarios. For instance, in response to a volatile and unpredictable future, one group designed a visual, collective decision-making tool to help students and teachers co-assess environmental conditions and adapt lesson content accordingly. Another group, tackling a future reliant on technology, proposed a framework for using accessible, low-cost tech (such as mobile phones and basic wearables) to enhance movement analysis and build climate-specific health literacy in heat-stressed environments. These tools exemplified a human-centred approach to innovation, where technology and methodology serve the primary goals of safety, agency, and learning.

Collectively, the eight prototypes demonstrated a remarkable capacity to translate abstract future scenarios into concrete, imaginative, and context-specific solutions. They moved the conversation from the problem of the planetary crisis to a diverse portfolio of possible responses, each grounded in the core values of sustainability, equity, and meaningful movement.

DISCUSSION

The diverse spectrum of prototypes, while varied in form and focus, reveals a set of powerful, cross-cutting themes that point towards a shared vision for the future of PE. These themes represent a significant departure from a purely biomechanical or performance-oriented view of the field, moving towards a more holistic, ecological, and socially conscious paradigm.

First, there is a profound emphasis on agency. This was evident across the range of prototypes, from those focused on teacher-led curriculum change to those empowering students as active decision-makers in their own learning. The prototypes consistently rejected passive models of education, instead advocating for a physical education (PE) that empowers individuals to understand their context, make informed decisions, and actively shape their environment through an embodied approach—one in which presenters are physically engaged. This aligns directly with the core goal of EfS to cultivate active and engaged citizens.

Second, the concept of resilience is central. This was most explicit in prototypes designed for volatile futures, which included tools for collective risk assessment, but it was also implicit across all scenarios. Prototypes developed for a resource-scarce future built resilience by teaching students to thrive with less. Those focused on technology demonstrated how it could build physiological and community resilience to climate impacts. Finally, proposals for systemic

change aimed to build professional resilience by equipping teachers with a broader and more adaptable pedagogical toolkit. This focus on resilience marks a critical shift from a PE focused solely on optimal performance to one that prepares students for a volatile and unpredictable world.

Third, community emerges as a critical enabler of change. The prototypes consistently looked beyond the walls of the school to find solutions. Curricular innovations relied on engaging local parents and community members to co-create content and share resources. Technological solutions envisioned partnerships with social enterprises. Professional development models were predicated on building communities of practice that extend across regions. This theme challenges the isolated, individualistic model of teaching and repositions PE as a networked, ecosystemic practice that is deeply embedded in its social and cultural context.

Finally, there is a strong undercurrent of critical pedagogy. The prototypes did not simply accept the future scenarios as given; they actively sought to intervene within them. Proposals for systemic professional development served as a direct critique of the cultural echo chambers that can limit professional vision. Project-based learning modules humorously but pointedly critiqued top-down, bureaucratic inertia. Methodologies for in-class decision-making subtly shifted power from the teacher to the collective. This critical stance is vital, ensuring that the reimagining of PE is not just about adapting to the future, but about actively working to make that future more just, equitable, and sustainable.

From a methodological perspective, the seminar demonstrated the power of using design fiction and scenario planning as "anticipatory trials." The ADEME scenarios provided a crucial scaffold, forcing participants to move beyond generic aspirations and grapple with the specific constraints and opportunities of a plausible future. The use of personas translated these abstract scenarios into lived human experiences, fostering the empathy necessary for meaningful design. The rapid, iterative nature of the design thinking-based hackathon, which culminated in a public pitch, created a sense of urgency and accountability that encouraged creative and pragmatic thinking. The process was not about finding a single "right" answer, but about exploring a plurality of possibilities and building a shared capacity for imaginative problem-solving.

CONCLUSION

This article has chronicled a journey from crisis to creation. It began by establishing the urgent need for Physical Education to engage with the profound challenges of the Anthropocene. It then detailed a novel methodological approach—a design thinking seminar structured around plausible futures—designed to facilitate this engagement. The results, in the form of five tangible prototypes, demonstrate that when educators are provided with the appropriate conceptual tools, creative space, and collaborative environment, they are capable of generating insightful, innovative, and hopeful visions for the future of their field.

The prototypes themselves offer valuable pathways for PE. They point towards a future that is more community-integrated, more ecologically aware, more technologically savvy in a human-

centred way, and more focused on building the resilience and agency of both students and teachers. They are not final blueprints, but provocative starting points for further research, development, and implementation.

Perhaps more importantly, the process itself offers a replicable model for other educational domains grappling with similar challenges. In a world of increasing complexity and uncertainty, the ability to collectively imagine, prototype, and debate alternative futures is not a luxury; it is a core capacity for institutional and societal learning. The "Future Matters" seminar demonstrates that by structuring this imaginative work, we can move beyond a discourse of crisis and anxiety and into a practice of constructive, collaborative, and hopeful creation.

The future of Physical Education, like the future of the planet, is not yet written. It will be the product of the choices we make, the values we prioritise, and the courage we bring to the task of building something new. This work is an invitation to the entire PE community to join in that effort—to see the future not as a fate to be endured, but as a project to be undertaken together.

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