

# Stretching UX Creativity: Crafting a Dystopian-to-Micro-Utopian Ideation Tool in the Digital Experience Theatre

António Gorgel Pinto<sup>1</sup>[0000-0002-4176-9495] and Paula Reaes Pinto<sup>2</sup>[0000-0003-1857-9797]

<sup>1</sup> UNIDCOM-IADE/Universidade Europeia, Lisbon, Portugal  
antonio.gorgel@universidadeeuropeia.pt

<sup>2</sup> CHAIA/University of Évora, Évora, Portugal  
pmrp@uevora.pt

**Abstract.** The Digital Experience Theatre (DXT) is a teaching method that embodies a pioneering approach to integrating sustainability into digital product design. Drawing from Augusto Boal's Theatre of the Oppressed and Paulo Freire's Pedagogy of the Oppressed, the DXT ideation tool employs a participatory design method to foster micro-utopian ideation and innovation in HCI and socio-technological design. By challenging students to delve deeper into design problems through dystopian narratives, speculative fiction, and AI image creation, the DXT encourages participants to envision more sustainable and humanity-centered digital solutions. DXT facilitates critical awareness of societal realities through its step-by-step process and fosters community-based design interventions. Experimentation with students and international collaboration underscore its potential to transform digital product creation. Readers are invited to get acquainted with this emerging ideation tool, whose website provides open resources for speculative scenarios, enabling designers to navigate from dystopian fictions to sustainable digital solutions. Ultimately, DXT represents a paradigm shift towards holistic and inclusive interaction design practices, contributing to a more effective use of technology for the common good.

**Keywords:** Problem-focused ideation tool, situated speculation, AI text-to-image generation, co-design UX method, community-based HCI.

## 1 Teaching Method Foundations

The research conducted within the Digital Experience Theatre (DXT) begins by identifying a pattern of unsustainability in the relationship between design and technology. It highlights the prevalent challenge where digital products often fail to effectively serve as a medium for ecological and socio-cultural understanding within a global-local context despite their increasing presence in facilitating human activities. The research's main questions are as follows: Is the integration of technology in digital devices guided by sustainability across economic, social, environmental, and cultural dimensions? Can

a co-design UX method, metaphorically described as a stretching problem-focused ideation tool shifting from dystopian to micro-utopian thinking, drive innovation in socio-technological design? Central to this challenge lies the interplay between design and technology, which has led to the emergence of innovative electronic devices. However, this innovation has not consistently aligned with a comprehensive sustainability framework across different domains.

The research aims to shape a UX design teaching method that leverages the prototyping of sustainable digital products. Additionally, it seeks to foster community empowerment and comprehensive development by acknowledging the evolution and significance of different places and communities, enriched by their unique histories, relationships, memories, and traditions.

The DXT leitmotif stems from the Theatre of the Oppressed (TO), crafted by Augusto Boal, based on the philosophy of Paulo Freire. This methodology views users of digital products as marginalised individuals navigating through a multitude of ineffective solutions whose main focus is related to commercial interests instead of being more useful for society. Embracing the TO approach, the DXT aims to construct a teaching method and a specific ideation tool as a means to achieve a certain goal, capable of engaging interaction design students through a co-design speculative process. Its goal is to catalyse change by fostering the development of innovative solutions that prioritise both community-based and humanity-centred principles, thereby addressing the prevailing challenges within the dynamics of social development.

### 1.1 The Theatre of the Oppressed

The DXT tool follows a sequential method inspired by Augusto Boal's Theatre of the Oppressed (TO), influenced by Paulo Freire's Pedagogy of the Oppressed. Freire's pedagogical approach involves critical awareness of social reality, enabling intervention and emancipation from oppressive relations. Boal, aligning with these principles, devised a methodology using theatre as a universally accessible tool to develop strategies for escaping oppressive relationships. The DXT ideation tool adapts one of the introspective techniques from Boal's book *Rainbow of Desire*, specifically *The Image of the Rainbow of Desire* (table 1) [1].

Augusto Boal (1931-2009), a Brazilian playwright and social advocate, consistently viewed art and theatre as inherently intertwined with social and political contexts, essential for fostering participation and activism. While in political exile during the 1970s and 1980s, he crafted the Theatre of the Oppressed methodology. Boal's approach emphasised the integration of artistic expression with societal realities, catalysing community engagement and empowerment.

Paulo Freire's (1921-1997) educational concept can be condensed as a journey of conscientisation towards social realities, enabling individuals to actively intervene and liberate themselves from oppressive structures. Formulated during the 1960s and 1970s amidst Brazil's literacy initiatives, Freire emphasised the necessity of a dialogical relationship between educator and learner for effective literacy programs. He asserted that true literacy encompasses not only technical skills but also critical inquiry into various

contexts, such as social, cultural, professional, economic, and political issues. According to Freire, this process of problematisation is pivotal for achieving liberation [2] [3].

Boal [4] developed his methodology with a vision of aiding in resolving societal and political challenges. He conceived theatre not solely as a domain for professionals but as a universally accessible medium for devising strategies to break free from oppressive structures. Through a repertoire of techniques and theatrical exercises, including Journal Theatre, Invisible Theatre, and Image Theatre, Boal aimed to empower individuals to transition from passive spectators to active spect-actors and influential protagonists. Traditionally, spectators relinquish their authority and agency to the actor-protagonist, allowing the latter to think and act on their behalf. Boal posits that this process represents a form of emancipation for the spectator, liberating them from passive reception and enabling them to engage critically with the performance, thereby assuming an active role in shaping social reality [5].

In line with Boal's perspective, UX designers, who also use digital products, are perceived as vulnerable agents, often overlooked in solutions that fail to address local community issues and promote social and cultural sustainability. Globally, a significant portion of users have access to a limited selection of high-quality apps, perpetuating the phenomenon known as the *society of the spectacle*, wherein the oppressed inadvertently support their oppressors. As outlined by Debord, the *society of the spectacle* is characterised by a network of social interactions mediated through images intricately linked with the capitalist system of producing and consuming commodities [6]. The process of societal spectacle and commodification reinforces existing structural disparities and power imbalances, exacerbating class alienation and cultural homogenisation [7].

Utilising the DXT tool to reflect on sustainable solutions for mobile device applications, designers find themselves poised as both spectators and spect-actors – both users and aware designers – recognising the pivotal nature of their creative input and transcending the confines of the oppressor-oppressed dichotomy. Through this collaborative and speculative methodology, designers prioritise problem identification over immediate solutions, fostering a heightened sensitivity to the imperative of reshaping unsustainable societal norms. This approach facilitates the prototyping of innovative UX experiments rooted in community engagement and humanity-centred principles, paving the way for transformative and empathetic digital experiences.

## 2 Generative UX Design through Speculation

The teaching method under analysis revolves around speculation as its core principle, leveraging the potency of speculative thinking within the realm of generative design thinking. The DXT is an example of speculative pragmatism [8] and situated speculation [9], harnessing experimental imagery to drive innovation. By generating AI-produced dystopian scenarios, the method aims to provoke critical reflection and creative ideation departing from design problem situations. Ultimately, the goal is to steer towards innovative micro-utopian futures, where these speculative exercises serve as catalysts for envisioning transformative solutions and shaping a more sustainable and desirable tomorrow.

Speculation can be viewed as an experimental form of cognition, shaping imaginative possibilities to foster a sense of experimental confidence in altering everyday realities. Speculative pragmatism is an experimental approach that utilises experience to forge novel and insightful connections among phenomena, opening up new possibilities for understanding and action. The pragmatic approach to experimentation emphasises that the thinking process involves both cognitive and emotional dimensions. It suggests that thinking is not merely a passive observation but an active exploration triggered by encountering challenging situations that demand creative problem-solving and the generation of new perspectives [8].

Using speculative thinking for design ideation represents a form of experimentation focused on generating suggestions, proposals, or concepts that, by embracing potential outcomes, can offer valuable guidance in addressing a design problem. As an exploratory endeavour, speculation aims to alter the trajectory from the present to the future by presenting “an alternative path towards a novel empirical situation.” It involves a responsive and imaginative approach to concrete issues in order to shape its future by exploring potential pathways that emerge from the observable facts and their interrelations [8, p.32].

Dunne and Raby are among the most well-known proponents and practitioners of speculative design, whose roots are in the critical design movement that both explored in the late 1990s and early 2000s to dwell on conventional perceptions of design and provoke thought by presenting alternative visions of reality. Dunne and Raby [9] state in their book *Speculative Everything: Design, Fiction, and Social Dreaming* that it is crucial to design objects that represent questions, assuming the role of players in societal fictions. The book showcases design projects that demonstrate how the future can be conceptualised and constructed, and how different it may be if those responsible for designing it had imagined different possibilities. The conundrum arises when Dunne and Raby situate their fictions within the genres of utopia and dystopia to critique the present and explore extreme versions of the future. Their speculation relies on the dichotomy between dystopian and utopian designs for an arguably impossible future and design for the real world. This approach balances fiction and non-fiction to boost design innovation [10].

The speculation explored within the DXT occurs in a specific design context or problem, serving as the foundation for speculative leaps while acknowledging the limitations imposed by this context. Halewood [11] describes this approach as situated speculation, stating that this initial constraint fosters productive speculation. It entails a belief in the world not as a static external entity but as an evolving entity in progress. Viewing speculation as an integral part of this ongoing world introduces another constraint, which is risk. Situated speculation inherently involves taking risks and is not about confirming hypotheses; rather, it is fundamentally pragmatic. Thus, the DXT speculation is evaluated solely based on its outcomes and impacts, with no definitive judgments of right or wrong, good or bad, where the unfolding micro-utopian designs can lead to sustainability and innovation.

Tony Fry [12, p.12] also points to situated speculation when highlighting the importance of writing design fiction, where this kind of narrative is considered a “situated



fictional elaboration of known facts, trends, and risks about emergent contexts and circumstances,” allowing subjective reflection to trigger design to “prefiguratively respond to especially negative futures.” Design fiction can be viewed as an enhancement to furthering the process of “futural design,” equally serving as a way to expand a designer's imaginative scope. According to this understanding, Fry states that design inherently envisions something yet to be realised and may inspire further research. Design fiction performs not merely as an extension, addition, or enhancement to visual representation but as a generative approach.

### 3 Problem-focused Ideation Tool from Dystopian to Micro-utopian Design Thinking

Dystopia is not merely the antithesis of utopia [13]. In addition to representing specific terms or genres, dystopia and utopia are academic classifications that hold significant capacity in reshaping how we understand the connections between the past, present, and future. Utopias and dystopias fundamentally aim to bring about profound changes to the social structure at its core. They focus on underlying issues and propose transformative answers.

Gordin et al. [13] argue that all utopia inherently carries the potential for dystopia within it. Whether it's the dystopia of the current state of affairs that the utopia aims to tackle or the dystopia that arises from the flaws in how this particular utopia functions. While utopia propels us towards a future and critiques the present, dystopia immerses us in a bleak reality, warning of a frightening future if we fail to acknowledge and address its warning signs in the present moment.

Instead of thinking of dystopia as the opposite of utopia, Gordin et al. [13, p.2] consider the triangulation “between the perfectly planned and beneficial, the perfectly planned and unjust, and the perfectly unplanned.” It is a connected phenomenon with the simultaneous interaction of ideas, aspirations, limitations, and consequences. Utopia, dystopia, and chaos aren't solely methods of envisioning the future or the past; they can also be seen as tangible methods through which actors, situated within specific contexts, strive to speculate about their present circumstances and shape them into a feasible future. Thus, utopian and dystopian thinking should delve into the unique characteristics of a particular time and space, consistently utilising the existing resources within the surrounding culture and leveraging them with particular objectives heavily influenced by the current context. This kind of representation and awareness can generate outcomes that prompt a reevaluation of the initial vision and influence both its evolution and people's perceptions of it.

In *Design for Micro-utopias*, John Wood [14] explores the idea of micro-utopias as small-scale initiatives or spaces that embody alternative visions of social organisation and collective living. These micro-utopias can take various forms and community-based designs, focusing on sustainability and social justice. The concept of small-scale realms within micro-utopias refers to the localised spaces where these initiatives unfold

and thrive, emphasising autonomy, collaboration, and creativity while offering opportunities for individuals and communities to experiment with new ways of organising society.

Regarding the DXT, the aim is that through the speculation around these small-scale realms, participants have the agency to shape a particular environment by focusing on the needs and aspirations of local communities and fostering a sense of belonging and empowerment among residents. Overall, the concept of small-scale realms within micro-utopias underscores the importance of grassroots initiatives and bottom-up approaches to social change. Through a problem-focused ideation tool from dystopian to micro-utopian design thinking, it is possible to create spaces where alternative values and practices can flourish.

The AI process of creating imagery to represent speculative dystopian scenarios allows creatives using the DXT to explore unexpected formulations and deepen the design problem they want to tackle. This novel ideation tool shifting from dystopian to micro-utopian thinking creates adequate conditions to discuss with no prejudices or pressures about what might be innovative solutions in socio-technological design pointing towards sustainability across economic, social, environmental, and cultural dimensions within a local-global context.

AI technologies have revolutionised the traditional montage concept, which relied on analogue collages of referenced fragments. Lev Manovich [15] highlights how these new tools have expanded creative possibilities by enabling the assembly of unexpected and non-real image components. This shift places democratisation and automation in tandem, reshaping the creative process towards a predictive rather than imitative paradigm. With a foundation built upon vast networks of images and data, AI-driven tools have emerged as unrestricted platforms for creative expression.





Text-to-image generation systems utilising deep generative models can produce digital images of a high aesthetic level when provided with a virtuous natural language prompt. The essence of human creativity in text-to-image synthesis doesn't solely reside in the final output but rather emerges from the dynamic interaction between humans and AI, giving rise to practices such as prompt design. Online communities influence how individuals master their knowledge of prompt design. It is this growing communal aspect of prompting that imbues text-to-image generation with creativity [16].


The text-to-image practice is an iterative process based on connecting image components across successive prompts. Chance plays a significant role in this process, as does the creative's openness to embrace unpredicted pathways in their interaction with AI. Since the AI images don't manifest instantly in their final state and are, instead, generated through an iterative text-to-image creative process, one can visually witness the gradual evolution of the images over time. Within this practice, the generation of images is also relevant, as is their curation, since the imagery is generated in groups of images that creatives discard or withhold between iterations until the publication of the most representative image [16].

## 4 Method

The research conducted for the DXT teaching method and the respective ideation tool is exploratory, serving as both a process of probe and a means of generating additional insights [17]. DXT's research through design has been developing across design activities, including bachelor's and master's design courses. Through this reflection in action process [18], design students engage in the experimentation of the ideation tool, not only to address practical problems or fulfil specific requirements but also to explore and generate new insights for the teaching method and tool. In this sense, at the core of the research strategy is comparing different DXT versions alongside annotations, which facilitates understanding the theoretical and practical facets of the DXT while also linking them to specific solutions for app designs. Since it began being developed in 2021, the DXT ideation tool has involved iterative cycles of design, prototyping, testing, literature review, reflection, and dissemination of the different research stages to generate comprehensive knowledge [19] (table 1).

**Table 1.** Annotated portfolio showing one project example from each DXT workshop. The second workshop introduced images based on AI text-to-image generation, while the first workshop used digital collage with images downloaded from the World Wide Web.

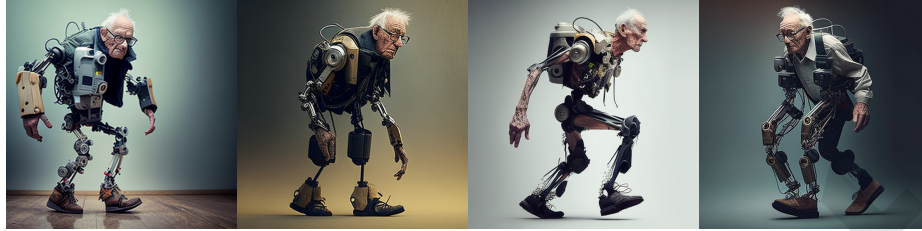
Research phase and DXT steps	Selected problem	Image technique	Dystopian images	Solution definition
1st workshop, 2022, with 12 steps.	Unsustainable garment consumerism. Overproduction of clothing and the use of polyester that affects the environment.	Digital collages with images searched on the web.	 	App to raise awareness for environmental issues and buy/exchange recycled clothing.
2nd workshop, 2023, with 12 steps.	The meat industry and its effects on the environment, social life, and overall well-being of animals and humankind.	AI images based on text-to-image generation.	 	App to encourage the purchase of local produce, support local farmers, and encourage people to adopt healthier eating habits.

3rd workshop, 2024, with 9 steps.	Loneliness and physical vulnerability among older people with low income residing in a poor neighborhood.	AI images based on text-to-image generation.		App that connects seniors and volunteers residing in a low-income housing community, enabling seniors to request assistance and volunteers to offer their help.
-----------------------------------	---	--	--	---

Before utilising the DXT ideation tool, students immerse themselves in the environments and interactions outlined in the design briefing in order to start exploring concepts for their mobile apps with a focus on socio-technological sustainability, as well as community empowerment and holistic development. In this sense, the teaching process begins with design ethnography as an initial step towards exploring fresh viewpoints and ideas. Design ethnography involves observing social situations to subsequently influence or modify them through intervention, followed by further observation, and so forth. It's a cyclical rather than linear process, where observation, analysis, and conceptualisation are interwoven [20].

The design ethnography approach is followed by the use of the DXT ideation tool to speculate novel perspectives and concepts, specifically by dystopian speculation. This pertains to the notion of agonism, a framework that enriches the nature of dissent, enabling the formation of diverse possibilities that reflect the emergency and vulnerability of social environments while also envisioning potential alternatives. Agonism resembles antagonism but differs in that, rather than presenting irreconcilable adversarial viewpoints with no common ground, it fosters a realm where opponents can engage in dialogue to cultivate a shared understanding [21] [22]. Agonism, through dystopian speculation, acknowledges that disagreement and diversity of perspectives are inherent in society and seeks to leverage these tensions creatively to generate innovative solutions. The method aims to foster dialogue, negotiation, and collaboration among students with differing viewpoints, ultimately leading to more robust and inclusive design outcomes when reaching the design solution phase.

The DXT co-design process, where groups of students engage in the co-creation of speculative dystopian scenarios through text-to-image AI generation, is another relevant aspect of the ideation tool (Figure 1). The co-design process begins when a group of individuals situated in a specific context define an issue and agree to establish a working foundation. According to Fuad-Luke [23], this dialogic process is followed by a series of design methods, where participants, whether potential users or other specialised stakeholders, can play more active or passive roles. The final stage of the co-design process concerns the deployment and evaluation of the produced solution and a critical analysis that allows for refinement and redesign.



**Fig. 1.** AI images generated with Midjourney during the DXT workshop at HdM Stuttgart, within the Exergames course, with the prompt "Parkinson's person turning into a robot."

The co-design of imagery based on text-to-image AI models merges with *The Image of the Rainbow of Desire* [1] method. The adaptation of Boal's method results in a step-by-step process in which student groups are divided into conductor-designers and antagonist-designers, the roles needed for the ideation tool to function. The conductor-designers lead the process and begin the image-based dialogue with the agonist-designers. In turn, the agonist-designers confront the conductor-designer's dystopian speculation, transforming the same image or idea. In this way, the DXT takes the students in both roles to the sequential co-design of a dystopian visual representation (table 2). In the end, after exploring a dystopian idea, the group is more aware of a particular issue and ready to focus on design solutions that tackle the same problem that raised the discussion.

A website featuring resources for DXT and an archive of dystopian images is available at <https://dxt.cargo.site/>. This ideation tool has been tested internationally with design professors and students in Lisbon, Portugal; Berlin and Stuttgart, Germany; and Budapest, Hungary.

**Table 2.** Comparison table showcasing differences between Rainbow of Desire (RoD) and Digital Experience Theatre (DXT), highlighting RoD omissions and DXT additions.

RoD	DXT
[extra step added to the DXT column]	<b>Step 1</b> —The group selects the problem to tackle according to threats to the earth's ecology or to societal needs, and the selected community.
<b>Rainbow</b> —The protagonist creates the images and presents them, which are subsequently reproduced by the participating characters who play the role of antagonists. The antagonist characters can create new images (from the protagonist's perspective).	<b>Step 2</b> —A pair of conductor-designers create and present to the agonist-designers a dystopian image based on the tackled problem (an AI image based on text-to-image generation).
[extra step added to the DXT column]	<b>Step 3</b> —The agonist-designers manipulate the created image, deepening the dystopia. Each agonist-designer creates a new version of the AI image or a different one, but from the perspective of the conductor-designers (thinking the same way they did).

<b>Confidential monologue</b> —The images are presented together. The protagonist delivers a brief 'confidential monologue' for each image, emphasizing their thoughts and feelings for each situation. All antagonist characters watch the confidential monologues, analyzing the protagonist's desires.	<b>Step 4</b> —The AI images are displayed together in a grid. The pair of conductor-designers interfere in each image created by the agonist-designers with keywords that function as 'a confidential monologue', identifying critical problems and possible solutions.
<b>The part takes over the whole</b> —The images created by each antagonist character are presented to the other antagonist characters, following an order devised by the protagonist. The antagonist observing the images reproduced by other antagonists must react to each one as if they represent different characters.	<b>Step 5</b> —The agonist-designers incorporate the ideas of the conductor-designers into their images by creating new versions.
<b>The complete rainbow</b> —The protagonist arranges all the images on the plateau, considering the antagonist's perspective, in order to emphasize certain characteristics more or less highlighted in each image.	<b>Step 6</b> —All the images are presented to the agonist-designers through a specific sequence (GIF animation) thought up by the conductor-designers.
<b>The protagonist takes the place of the antagonist</b> —After organizing the images, the protagonist adopts the perspective of the antagonist, becoming aware of how they are perceived.	[no correspondence with the RoD column]
<b>Will against desire</b> —The protagonist confronts each of their desires (images), emphasizing those approved by their will and confronting those disapproved by their will.	[no correspondence with the RoD column]
<b>Agora of desires</b> —The antagonist characters and their respective images discuss their views of the protagonist in pairs. The meetings repeat until all antagonists have met with their counterparts. The protagonist observes the antagonists in dialogue. [extra step added to the DXT column]	<b>Step 7</b> —Each agonist-designer writes a comment for each of the other agonist-designers' images.
<b>Reimprovisation</b> —The images created between the protagonist and their respective antagonist are reinterpreted, with the protagonist imposing their will.	<b>Step 8</b> —Everyone reads the comments of others, selecting and marking what they think is the most significant. [no correspondence with the RoD column]
<b>Discussion</b> —All actors and/or participants share what they felt and perceived from each created image.	<b>Step 9</b> —Final group discussion about the most relevant design problems and possible solutions for interactions. Definition of concepts for digital products/games/services.

#### 4.1 AI-generated content

While experimenting with different text-to-image AI models, the students who have been participating in the DXT co-design process are faced with the problem that AI-generated content exacerbates societal stereotypes and contributes to environmental concerns, notably affecting the climate and humanity. By highlighting the social and ecological challenges linked with AI technology, attention is drawn to the imperative for AI to evolve toward greater efficiency in addressing these issues and minimising its adverse effects. This underscores the pressing necessity to comprehensively shape AI policies and ethical frameworks, considering all dimensions of its impact on the planet.

Some AI models designed for generating images from textual descriptions tend to create more white, younger men, while others generate more white women and are more equal in age representation, as it's possible to observe above (Figure 1) in the representation of older people who have Parkinson's and use robotic-powered prostheses, who are all white. Likewise, these models strengthen and worsen biases related to stereotypical traits associated with occupations and personalities. Nonetheless, findings from these models also indicate that employing prompt expansion strategies can effectively enhance diversity, though there are a few instances where they prove ineffective. The main social biases are related to gender, race, age, and geographical location [24].

Prompt expansion strategies are techniques used to broaden or refine the scope of a prompt to generate more diverse or relevant responses from an AI model. These strategies can vary depending on the context, but they generally aim to encourage more comprehensive and informative answers. Therefore, the DXT participants are encouraged to use appropriate semantics and prompt expansion strategies, such as (1) offering thorough and detailed descriptions of the desired image, which tends to generate more significant outcomes; the specificity of the prompt correlates with a better understanding of the expected image; (2) employing specific keywords or terms that distinctly represent the desired visual elements, which guides the model toward producing more precise images; (3) integrating textual descriptions with visual references to enhance comprehension of expectations; (4) fine-tuning the prompt based on initial results, such as adjusting it if the first generated image doesn't align entirely with expectations and iterating the process to enhance image quality; (5) achieving a balance between providing specific details and allowing creative solutions proposed by the AI model, which fosters unexpected and innovative outcomes; (6) adopting an experimental approach with diverse prompt strategies to facilitate a deeper understanding of how models respond to varied semantics, enhancing the ability to generate desired images.

It is important to emphasise that gender, race, and age expanded prompts might not completely address bias in generating images, delivering wrong or weird responses, or even introducing new biases. They can also result in inconsistencies and declines in image quality [24].

In terms of AI's impact on climate change, researchers acknowledge that the training and operation of AI systems require substantial computational resources and electricity, resulting in carbon dioxide emissions. Additionally, AI's ecological footprint extends beyond carbon emissions, encompassing various environmental factors. For instance, the use of AI in automated advertising, particularly in interactions like social network

news feeds, heavily relies on advertising algorithms that promote consumer behaviour, contributing to overall consumption in society. For this reason, while the DXT participants in the discussion are engaged in a reflection on AI's environmental impact, they are also encouraged to explore AI applications in their solutions aimed at addressing local-global sustainability, climate change, and related environmental challenges [25].

## 5 Mapping Future Moves

The teaching method and research supporting the DXT stand at a pivotal juncture poised for continued evolution. Through iterative workshops, reflection, and dissemination, the study will continue refining the methodology and expanding its outreach within the design community. Particularly, by comparing different DXT versions alongside annotations, which aids in understanding the conceptual and operative aspects of the method and tool, while also linking them to specific design solutions. This amplifies the method's potential for fostering socio-technological innovation in the realm of digital product design for mobile devices.

It's crucial at this stage that the ideation tool is improved to collect primary data from a panel of experts from different fields, such as speculative design, interaction design, and design education, allowing a more in-depth critical analysis.

The website, serving as a comprehensive resource hub for the ideation tool guidance, with an archive of dystopian imagery and additional materials, will be a cornerstone for future engagement. Looking ahead, the focus will extend to curating app prototypes generated through the DXT ideation tool, enriching the repository of design insights.

## Acknowledgements

Research financed with National Funds through FCT – Portuguese Foundation for Science and Technology, within the scope of the following projects: UIDB/00112/2020, UIDB/00711/2020. Images developed by students at IADE Universidade Europeia and HdM Stuttgart.

## References

- [1] Boal, A. (1994). The Rainbow of Desire: the Boal method of theatre and therapy. <http://ci.nii.ac.jp/ncid/BA24216733>
- [2] Freire, P. (1970). "The Adult Literacy Process as Cultural Action for Freedom", Harvard Educational Review, 40 (2): 205-225
- [3] Freire, P. (2014). Pedagogia do oprimido. Paz e Terra.
- [4] Boal, A. (2019). Teatro do Oprimido e outras poéticas políticas. Editora 34.
- [5] Peixoto, F. (1980). "O Teatro do Oprimido invade a Europa". Encontros com a Civilização Brasileira. V. III (19). Rio de Janeiro. pp. 165-185.
- [6] Debord, G. (1995 [1967]). The Society of the Spectacle (Trans. Nicholson-Smith, D.). Zone Books.



- [7] Debord, G. (1990 [1988]). *Comments on the Society of the Spectacle* (Trans. Imrie, M.). Verso.
- [8] Savransky, M. (2017). The Wager of an unfinished present: Notes on speculative pragmatism. In *Speculative Research: The Lure of Possible Futures* (pp. 25–38). Routledge. <https://doi.org/10.4324/9781315541860-3>
- [9] Dunne, A., & Raby, F. (2013). *Speculative Everything*. MIT Press.
- [10] Yelavich, Susan. (2015). *Speculative Everything: Design, Fiction, and Social Dreaming*. *Journal of Design History*. 28. 10.1093/jdh/epv001.
- [11] Halewood, M. (2017). Situated speculation as a constraint on thought. In *Speculative Research: The Lure of Possible Futures* (pp. 52–64). Routledge. <https://doi.org/10.4324/9781315541860-3>
- [12] Fry, T. (2021). Writing Design Fiction: Relocating a city in crisis. In Bloomsbury Publishing Plc eBooks. Bloomsbury Visual Arts. <https://doi.org/10.5040/9781350217331>
- [13] Gordin, M. D., Tilley, H., & Prakash, G. (2010). *Utopia/Dystopia: Conditions of Historical Possibility*. Princeton University Press.
- [14] Wood, J. E. (2007). Design for Micro-Utopias: Making the unthinkable possible. <https://eprints.lancs.ac.uk/id/eprint/39808>
- [15] Manovich, L. (2023). AI image and Generative Media: Notes on Ongoing Revolution. In E. Arielli & L. Manovich (Eds.), *Artificial Aesthetics* (manovich.net). <http://manovich.net/index.php/projects/artificial-aesthetics>
- [16] Oppenlaender, J. (2022). The Creativity of Text-to-Image Generation. *Academic Mindtrek 2022*, November 16–18. <https://doi.org/10.1145/3569219.3569352>
- [17] Cross, N. (2007). From a design science to a design discipline: understanding designerly ways of knowing and thinking. In De Gruyter eBooks (pp. 41–54). [https://doi.org/10.1007/978-3-7643-8472-2\\_3](https://doi.org/10.1007/978-3-7643-8472-2_3)
- [18] Schön, D. A. (1983). *The reflexive practitioner: How professionals think in action*. New York: Basic Books.
- [19] Gaver, W. W. (2012). What should we expect from research through design? In *Proceedings of the SIGCHI Conference on Human Factors in Computing Systems (CHI '12)*. Association for Computing Machinery, New York, NY, USA, 937–946. <https://doi.org/10.1145/2207676.2208538>
- [20] Müller, F. (2020). *Design Ethnography: Epistemology and Methodology*. Springer Nature.
- [21] Mouffe, C.: *The Democratic Paradox*. Verso Books (2009).
- [22] Disalvo, C.: *Adversarial Design*. The MIT Press, Massachusetts, London (2012).
- [23] Fuad-Luke, A., 2009. *Design activism beautiful strangeness for a sustainable world*. Earthscan, London, UK.
- [24] Naik, R., & Nushi, B. (2023). Social Biases through the Text-to-Image Generation Lens. *arXiv* (Cornell University). <https://doi.org/10.48550/arxiv.2304.06034>
- [25] Coleman, J. (2024, February 20). *AI's Climate Impact Goes beyond Its Emissions*. *Scientific American*. <https://www.scientificamerican.com/article/ais-climate-impact-goes-beyond-its-emissions/>