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Tecnológico de Monterrey
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Arte y Diseño

Cumulus conference: Design Across Borders - United in Creativity

Co-hosted by the Universidad de Monterrey (UDem) and the Tecnológico de Monterrey (Tec)
Monterrey, Mexico, on October 16-18, 2024

Conference website: <https://cumulusmonterrey2024.udem.mx/>

Published by Cumulus

Cumulus the Global Association of Art and Design Education and Research.

Aalto University, School of Arts, Design and Architecture

PO BOX 31000, FI-00076 Aalto

<https://cumulusassociation.org/>

ISSN 2490-046X

ISBN 978-952-7549-06-3 (pdf)

No. 13 Cumulus Conference Proceedings Series

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Editors: Alessandra Perlatti

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FROM DYSTOPIA TO MICRO-UTOPIA: SOCIETAL CHANGE THROUGH DIGITAL DESIGN INNOVATION.

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ABSTRACT | This research paper combines socio-cultural sustainability with digital product design through a co-design and user experience (UX) approach. It draws attention to the unsustainable relationship between design and technology and proposes a problem-focused approach instead of a solution-focused one. The study showcases the Digital Experience Theatre (DXT), a creative tool influenced by Augusto Boal's Theatre of the Oppressed, customised for digital design. DXT combines speculative co-design and text-to-image AI to urge participants to imagine dystopian situations to recognise and address current societal problems. This approach has been implemented in educational environments, particularly in the Zambujal 360 initiative – the focus of this paper – where students developed digital solutions to tackle issues specific to their community in the neighbourhood of Zambujal in the Lisbon metropolitan area, Portugal. The paper contends that shifting from a dystopian to a micro-utopian mindset can facilitate substantial societal changes by encouraging critical consciousness and cooperative resolution of problems. By fostering a participatory design process that emphasises critical awareness and creative problem-solving, the DXT method has the potential to inspire innovative solutions that address complex social challenges. Ultimately, the paper argues that digital design innovation, when coupled with socio-cultural sustainability principles, can play a pivotal role in driving positive societal transformation and nurturing a more equitable and sustainable future.

KEYWORDS | SOCIO-TECHNOLOGICAL DESIGN, USER EXPERIENCE, IDEATION TOOL FOR CHANGE, SPECULATIVE CO-DESIGN, TEXT-TO-IMAGE AI GENERATION



1. Image theatre for social change

This study stems from the pattern of unsustainability in the design-technology relationship. Sustainability is a concept first defined in the Brundtland Report on the environment in 1987 as “development that meets the needs of the present without compromising the ability of future generations to meet their own needs”, integrating environmental goals with economic ones. The use of the term has spread widely in the past four decades, and it can be found alongside most various adjectives, which contributes to its ambiguity (Garcia et al., 2018, p. 242). When digital processes and products are preoccupied with sustainability, they tend to associate social responsibility and environmental standards with economic and business sustainability. Despite their growing role in facilitating human activities within a global-local context, there is a common problem of digital products frequently failing to convey ecological and socio-cultural insights. We argue that the integration of technology in digital devices should be guided not simply by economic sustainability but also by environmental, social, and cultural sustainability.

To do so, our contribution stems from the development of a co-design UX method, using a problem-focused approach. Contrary to solution-focused approaches, which are intimately linked with creative thinking and the pursuit of answers to the “how?”, “problem-oriented thinking is closely linked to critical thinking, and questions like why? and what? help with the formulation of the problem” (Pusca & Northwood, 2018, p. 48). Our ideation tool can be metaphorically described as shifting from dystopian to micro-utopian thinking to drive innovation in socio-technological design. Richard Howells (2014) argues that the very act of design is a Utopian process. And Dystopia is inevitably bound with Utopia. In this sense, design processes and practices that use tools that envisage crisis scenarios for the future can help identify present problems and, ultimately, ways to deal with them. Instead of picturing ideal and hopeful futures, the depiction of desperate and catastrophic alternatives may be more useful as a methodology. Lucy Sargisson suggests that dystopias can stimulate thought and debate and can eventually trigger behavioural change (Sargisson, 2013).

Nonetheless, we drift from the dystopian-centered perspective and try to pay attention to the referred micro-utopias. Instead of focusing on the ideal, unreal, and non-accomplishable prospects of utopias (or their dystopian shadow), micro-utopias, or “utopias of proximity”, as the art critic Nicolas Bourriaud called them, are located in the micro-realm of “the concrete, the material and the everyday”, or a “space of *concrétude*” (Blanes et al., 2016, p.9). In that way, they can be not simply thought-provoking but actually useful for application in society.

With his concept of “everyday micro-utopias”, Bourriaud wanted to approximate art practices to the processes of ordinary life, with its particular social contexts and human relations. Criticising the objectification of social interactions and the dissociation of the artist from their audience led to his conceptualisation of a type of art practice that should be more flexible, relational, and collective. The artists – in our case, the designers – should not distance themselves from the public if they aim at a more useful and democratic practice. Micro-utopias appear as statements that result from the collective ability to imagine and create in the local and concrete sphere of social life.

This is what Mark Featherstone talks about when he begins his *Planet Utopia* by recalling psychoanalyst D. W. Winnicott, for whom the creativity we learn through childhood play is what will model cultural development in our future. The experience that occurs in a safe family environment that allows the child to

imagine an infinite number of possible worlds is the one that we transpose into adult life. For Featherstone, “imagination, creativity, and the invention of the new are absolutely reliant on psychological security defined and provided by others and community” and derive from “experiences that are enabled by groups that create secure spaces to allow them to happen” (Featherstone, 2017, p.2). This idea of community and collective as a driver of new ideas is central to our project.

Within this scope, the research’s main goal is to develop a teaching method and ideation tool titled Digital Experience Theatre (DXT) that embodies an approach to integrating social and cultural sustainability into digital product design through the conceptualisation of microutopias. The DXT leitmotif stems from the Theatre of the Oppressed (TO), crafted by Augusto Boal (2019), viewing users of digital products as oppressed individuals navigating through a multitude of ineffective solutions whose main focus is related to commercial interests instead of being more useful for society, generating fruitful interactions with human and non-human communities. This paper specifically examines the application of the DXT method in the classroom, focusing on its use in the Digital Interfaces course within the Master’s program in Design and Visual Culture at IADE, Universidade Europeia (Lisbon, Portugal).

Augusto Boal’s Theatre of the Oppressed was influenced by Paulo Freire’s Pedagogy of the Oppressed (2014), which involves critical awareness of social reality, enabling

intervention and emancipation from oppressive relations. Paulo Freire's (1921-1997) educational concept can be condensed as a journey of conscientisation toward 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's theory emphasised the necessity of a dialogical relationship between educator and learner for effective literacy programs. True literacy should encompass not only technical skills but also critical thinking capabilities to review different contexts and issues. According to Freire, this process of problematisation is pivotal for achieving liberation (Freire, 1970).

Augusto Boal (1931-2009) had always been a social advocate and consistently viewed art and theatre as inherently intertwined with social and political contexts, essential for fostering participation and activism. Affiliated with Freire's principles, he conceived the Theatre of the Oppressed methodology while in political exile during the 1970s and 1980s. This methodology has theatre as its central piece, functioning as a tool accessible to all as a means to escape 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* (Boal, 1994).

2. Speculative co-design method

The study undertaken for the DXT teaching method and the related ideation tool is exploratory, serving as both a process of probe and a way to generate more insights (Cross, 2007). DXT's research through design has been moving forward through several design workshops involving undergraduate and graduate design courses in Portugal and abroad. Design students participate in the process of reflection in action (Schön, 1983) by actively experimenting with the ideation tool for exploring design problems and tackling specific issues, as well as enabling them to explore and generate new ideas for the teaching method and tool. From the start of the research to the final version of the tool presented in this paper, the DXT evolved significantly with contributions from the students who tested it, particularly following observations of their interactions with the process and insights gained through unstructured interviews. At the heart of the research approach is the comparison of several versions of DXT, aiming to enhance the understanding of various theoretical and practical aspects (Gaver, 2012). This is achieved through iterative cycles of design, prototyping, testing, literature review, reflection, and dissemination, spanning from its development in 2021 to the present.

The DXT employs a co-design method where groups of students collaborate to create speculative dystopian scenarios using text-to-image AI generation. In this process,

participants collectively identify a problem and agree on a speculative framework within which they can assume either active or passive roles. Co-design and participatory design are characterised by collaborative discussions among individuals (Manzini, 2015). In this dialogic approach, where listening is as crucial as speaking, the development of the dystopian co-design process hinges on effective dialogue. While critical thinking and creativity are key in the DXT, enhancing participants' dialogical skills is essential for optimising the co-design process. This dialogical approach should facilitate and enrich the co-design process rather than control it (Fuad-Luke, 2009). Although co-design and participatory design are often seen as methods for achieving consensus among participants with divergent perspectives, they can evolve into agonistic design processes, where conflicting viewpoints lead to productive analyses (DiSalvo, 2012). The final phase of the DXT ideation tool and method involves a critical analysis of the created dystopia and a thorough evaluation of potential solutions.

Integrating text-to-image AI models with The Image of the Rainbow of Desire (Boal, 1994) approach facilitates the collaborative generation of visual representations. This AI method of generating visual representations of speculative dystopian scenarios enables participants using the DXT to experiment with unexpected situations and further explore the design problem they aim to address. Following Boal's sequential approach, the DXT entails a similar systematic procedure whereby

participants are separated into conductor-designers and antagonist-designers, both essential for the effective functioning of the ideation tool. The conductor-designers take charge of the process and initiate an image-based conversation with the antagonist-designers. The antagonist-designers, in response, challenge the dystopian speculation put out by the conductor-designer, thereby altering an identical image or idea. The DXT process engages participants in both roles in the sequential co-design of dystopian imagery, utilising an adapted version of The Rainbow of Desire method (table 1). The end result is that following an iterative cycle of dystopian images related to a problem's worst-case scenario, the group acquires a more profound comprehension of a specific matter and is presumably prepared to put its energy into designing solutions that address the very problem that triggered the conversation.

Table 1. Comparison table showcasing differences between the *Rainbow of Desire* (RoD) and the Digital Experience Theatre (DXT) methods, highlighting RoD omissions and DXT additions.

RoD	DXT
Rainbow of Desire	Digital Experience Theatre
[extra step added to the DXT column]	Step 1 The group selects the problem to tackle according to threats to the earth's ecology or to societal needs, and the selected community.
Rainbow 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).	Step 2 A pair of conductor-designers create and present to the antagonist-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]	Step 3 The antagonist-designers manipulate the created image, deepening the dystopia. Each antagonist-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).
Confidential monologue 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.	Step 4 The AI images are displayed together in a grid. The pair of conductor-designers interfere in each image created by the antagonist-designers with keywords that function as 'a confidential monologue', identifying critical problems and possible solutions.
The part takes over the whole 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.	Step 5 The antagonist-designers incorporate the ideas of the conductor-designers into their images by creating new versions.
The protagonist arranges all the images on the plateau, considering the antagonist's perspective, to emphasize certain characteristics more or less highlighted in each image.	All the images are presented to the antagonist-designers through a specific sequence (GIF animation) thought up by the conductor-designers.
The protagonist takes the place of the antagonist 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]
Will against desire 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]
Agora of desires 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.	Step 7 Each antagonist-designer writes a comment for each of the other antagonist-designers' images.

Such as the DXT steps, the text-to-image exercise is a repetitive procedure that relies on combining visual components across consecutive prompts. Chance and the creative's willingness to embrace unforeseen pathways both play important roles in this process of interacting with AI and experimenting with dystopian situations. Within this cyclical text-to-image creative technique, the AI images do not appear instantly in their ultimate form. Instead, they are formed gradually, allowing one to observe the progress of the images as they develop visually. In such a method, it is important to not only create images but also curate them, as the images are made in groups, and creatives choose to delete or further develop some until the most representative one is created.

During the DXT process, participants are made aware that text-to-image AI generation worsens societal stereotypes and contributes to environmental concerns, particularly impacting the climate and humanity. The collective reflection promoted within the DXT teaching method emphasises the social and ecological challenges associated with AI technology and underscores the need for continuous improvement in AI effectiveness to address these challenges and mitigate its negative impacts. It is highlighted that gender, racial, and age expanded prompts may not fully mitigate bias in image generation, leading to incorrect or unusual responses and maybe introducing new biases (Naik & Nushi, 2023). Regarding the effect of AI on climate change, the training and operation of AI systems demand significant

computational resources and electricity, leading to the release of carbon dioxide emissions.

Furthermore, AI's environmental impact extends beyond carbon emissions to encompass other ecological concerns, such as driving increased consumerism. Therefore, participants in the DXT debate are encouraged not only to reflect on the environmental impact of AI but also to research how AI can be used to address sustainability, climate change, and other environmental issues on both local and global levels.

Prompt expansion strategies effectively broaden or refine the scope of a prompt to elicit a wider range of relevant or varied responses from an AI model. These strategies may differ depending on the circumstances, but their main objective is to promote more detailed and informative responses from AI systems. Thus, the participants of DXT are advised to employ efficient semantics and prompt expansion tactics to attain the best possible results in image generation. The procedures encompass offering comprehensive and elaborate explanations to enhance the interpretation of the intended image, employing specific keywords to depict desired visual aspects more accurately, and integrating textual descriptions with visual references, which clarify demands. Additionally, participants should refine prompts based on initial results and iterate to enhance image quality. This involves balancing specific details with allowing AI model creativity to foster innovative outcomes, among other strategies for understanding model responses and improving image generation.

3. Interaction designs for the Zambujal 360

The Zambujal 360 is in the Zambujal neighbourhood, with a population of approximately 4000 inhabitants. It is located in the Alfragide parish, Amadora municipality, Lisbon metropolitan area. It is an initiative from the NGO Ad Gentes, and the CAZambujal association focused on creating an urban art gallery inspired by the 17 Sustainable Development Goals (SDGs) and acting as a social change agent to promote sustainability. Each SDG is supported by a sponsoring organisation that is tasked with conducting global citizenship activities, such as guided tours to the urban art gallery dedicated to the SDGs, providing training for schools and companies, promoting the adoption of sustainable business models, and offering educational programs focused on development (Ad Gentes, n.d.; UNRIC, n.d.). IADE, Universidade Europeia, was involved

in this fertile coalition between citizens and entities, mainly through the curricular unit of Digital Interfaces within the Master of Design and Visual Culture from the same institution.

A group of 17 artists, each with a unique background, sources of inspiration, and artistic methods, have been collaborating to finish the construction of the urban art gallery before the end of 2024 (figure 1) (UNRIC, n.d.). The Zambujal 360 aims to establish a paradigmatic SDG route to attract visitors, tourists, and students to the neighbourhood, which was precisely what happened with the group of IADE students and professors that engaged with this local initiative to develop innovative smartphone concepts for applications that contribute not only to boosting local commerce and education through health and art but also to encouraging community empowerment and holistic growth while valuing interrelationships and multiculturalism.



Figure 1. Mural paintings from the Zambujal 360 project. On the left is a painting illustrating SDG 5, Gender Equality, by Mariana Duarte Santos. On the right is a painting by the artist Lúcia Fernandes on SDG 2, Eradicate Hunger. Photos by

The Zambujal 360 is founded on three main principles: (1) supporting local businesses - establishing a network of merchants, promoting their businesses, and fostering sustainable economic practices; (2) promoting health education - addressing the physical, mental, and emotional impacts of the COVID-19 pandemic through physical activity as a means to enhance well-being; and (3) improving art education - establishing an urban art gallery centred around the 17 SDGs, serving as a catalyst for social change, promoting sustainability, strengthening local identity, and challenging external barriers and stereotypes. The initiative aims to comprehensively transform the area by creating value via youth training, establishing a network of merchants, improving urban spaces, and promoting artistic, social, and cultural activities (Ad Gentes, n.d.).

The briefing delivered to students targeted the creation of a smartphone app associated

with the brand and visual identity of the Zambujal 360 project – a digital product for mobile devices that considers contemporary visual culture and all the aspects that determine effective communication with the users to be considered, such as the neighbourhood residents, tourists, and other visitors (table 2). Students were asked to select an existing service or propose a new one and develop a touchpoint, the point of contact whose function is to boost a user's service experience. In this case, the touchpoint would need to be an integral part of a smartphone app that users would activate during their experience. Students followed the UX/UI methodology to develop the information architecture plan, the sitemap, and the creation of low-fidelity wireframes, followed by the design system, from the fundamentals to the UI components and patterns. Finally, high-fidelity prototyping, heuristic evaluation, usability testing, and iterative refinement were performed.

Table 2. Annotated portfolio showing three projects from the same DXT workshop related to the Zambujal 360 briefing.

Group	Selected problem	Image technique	Dystopian images	Solution definition
Group 1	Scarcity of shops offering fresh daily food pushes residents to resort to buying cheaper processed food and fast food.	AI images based on text-to-image generation.		An app that lets users find nearby grocery stores selling fresh produce on a map and view video recipes. It also allows shops to advertise unsold items at reduced prices at the end of the day.
Group 2	Children's mental health issues stemming from bullying or other emotional trauma that occur within their social bubble.	AI images based on text-to-image generation.		An app that uses augmented reality (AR) technology to let children explore mural paintings and the culture of the Zambujal community. It features a virtual exploration game where users collect characters and visual references inspired by the paintings.
Group 3	Loneliness and physical vulnerability among low-income older adults place them in difficult situations.	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.

Students were asked to use the DXT approach and take a speculative design tactic as a starting point to represent a vision of the world that focuses not only on the user (user-centred) or on the human being (human-centred) but on humanity as a whole (humanity-centred). However, before using the DXT ideation tool in the Zambujal 360 context, students engaged in the environment described in the design briefing to begin exploring ideas for their mobile apps. They specifically focused on

socio-technological sustainability, community empowerment, and holistic development. From this perspective, understanding the design problem and the eventual users started with design ethnography as an early stage to investigate and analyse users' cultural and social contexts to inform and inspire the design process. In our case, design ethnography entailed the systematic observation of social circumstances, analysis, and conceptualisation. Table 2 presents the challenges students addressed using the DXT

ideation tool and its speculative approach to respond to the Zambujal 360 brief, along with the solutions developed by the end of the workshop.

The digital product prototype created by group two, titled Zambujal 360 Hero: An Educational Game App, is an innovative application that uses augmented reality (AR) technology to actively involve young people in the neighbourhood mural paintings and multicultural heritage of Zambujal (figure 2). The app transforms traditional sightseeing by providing an immersive experience, which allows users to explore the original artworks and gain knowledge of the local history and culture through compelling augmented reality features.

A key feature of the application is a virtual adventure game that seeks to captivate users by including elements inspired by Pokémon

GO. Children can gather different characters and visual references from the artworks as they engage with the murals through a gamified interaction. Each character and reference is complemented with educational content, including informative details and narratives about the local culture and the paintings' significance.

The app aims to enhance understanding and appreciation for art and culture while providing interactive activities to improve education. This educational experience combines augmented reality technology with a gamified approach to exploration. It aims to address mental health issues resulting from bullying or emotional trauma by providing a fun and informative adventure. Additionally, it strengthens social connections and allows easy access to the history and culture of Zambujal for future generations.

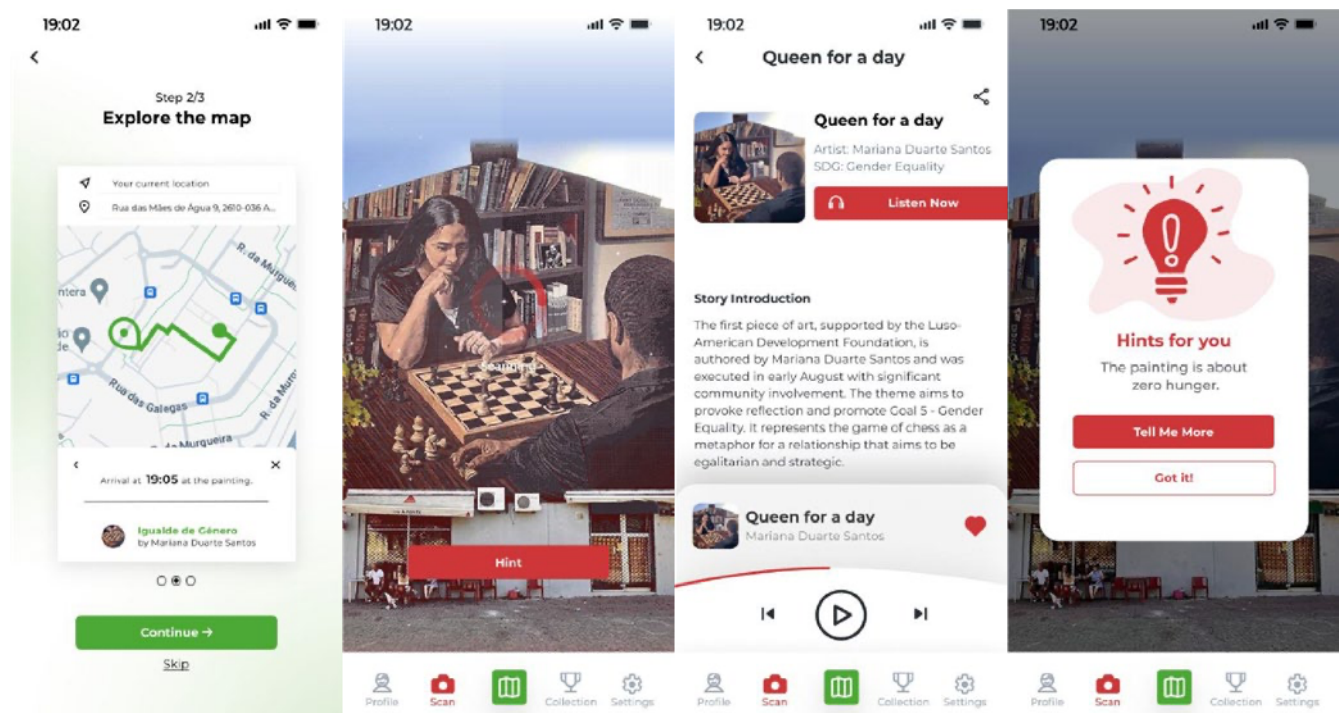


Figure 2. Screenshots from the app prototype titled Zambujal 360 Hero: An Educational Game App, by Jiaai Cao & Alexa Fislage, that uses gamification and AR technology to involve users in the mural paintings' interpretation.

4. Assessing DXT's educational and societal outcomes

The present research focuses on the intersection of UX design and societal transformation, emphasising the transformative power of co-design methods and the Theatre of the Oppressed methodology to boost sustainability and social innovation. The DXT proposes an uncommon strategy to tackle current socio-technological problems by shifting from dystopian to microutopian scenarios. In this context, it is essential to scrutinise the consequences and results of using DXT, considering its effectiveness in the educational setting and broader societal influence.

Regarding the co-design approach and the practice of creating micro-utopias, the DXT ideation tool and teaching method targets the collaborative recognition and solution discovery of design problems. Such a collaborative approach is consistent with Augusto Boal's The Image of the Rainbow of Desire method, which emphasises the significance of critical consciousness and engaged participation in dismantling oppressive systems. DXT involves creatives actively participating in speculative co-design by employing text-to-image AI generation to create and continuously improve dystopian scenarios. This technique stimulates creativity and critical thinking and improves participants' ability to engage in dialogue, facilitating effective communication and collaboration.

The practical applications and societal impact of DXT were exemplified by several student projects, including those undertaken as part of the Zambujal 360 initiative. These projects demonstrate how speculative design can confront real-world issues across different areas, such as food scarcity, mental health difficulties, and social isolation among older adults. Using DXT, students created innovative digital solutions, including a mobile application designed to pinpoint places of local fresh food vendors and an augmented reality game that fosters a connection between users and their local culture. These solutions not only tackle the current needs of the Zambujal community but also contribute to larger objectives of sustainability and cohesiveness.

In the near future, the DXT ideation tool and teaching method have significant potential for broader application in various human and non-human scenarios, where a speculative approach can drive the development of digital solutions with non-anthropocentric objectives. By nurturing a culture that promotes critical awareness and collaborative problem-solving, DXT has the potential to bring about significant societal transformation, turning dystopian realities into small-scale utopian opportunities.

5. Conclusion

The research featured in *From Dystopia to Micro-Utopia: Societal Change Through Digital Design Innovation* highlights the potential of UX and interaction design to face socio-technological concerns by employing a specific co-design method. The study presents the Digital Experience Theatre (DXT) as a research approach, teaching method, and tool for generating ideas, inspired by Augusto Boal's Theatre of the Oppressed. Its purpose is to promote collaborative problemsolving and critical thinking among participants. The DXT aspires to bring innovative and sustainable solutions for local-global everyday problems by employing text-to-image AI generation to create speculative dystopian scenarios. The effectiveness of this approach has been demonstrated in educational settings, particularly in the case study highlighted in this paper – the Zambujal 360 project – where students developed digital solutions to address challenges specific to the Zambujal community. The research stresses the significance of incorporating social and cultural sustainability into digital design, favouring a transition from a dystopian to a micro-utopian mindset to facilitate substantial societal change. The possible uses of the DXT extend beyond human situations, indicating a broader influence on many socioeconomic and environmental concerns.

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Acknowledgments: This research is 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.

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Published by Cumulus

Cumulus the Global Association of Art and Design Education and Research.

Aalto University, School of Arts, Design and Architecture

PO BOX 31000, FI-00076 Aalto

<https://cumulusassociation.org/>

ISSN 2490-046X

ISBN 978-952-7549-06-3 (pdf)

No. 13 Cumulus Conference Proceedings Series



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