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What if interactive artifacts would disrupt human relations?

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9-11 May 2024

A cura di
Mario Bisson

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ALTERNATIVE FUTURES

What if interactive artifacts would disrupt human relations?

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Abstract

If the act of Designing is concerned with forthcoming future, during the last 20 years both Design Fiction researchers and Speculative Designers pointed out how Design must imagine and debate on preferrable and possible futures. To encourage this transformation, it is crucial to evaluate new approaches precisely in the educational field. The paper aims to illustrate an experimentation that links research and teaching, based on the intersection between Interaction Design based on a narrative-fictional approach and Speculative Design, in order to: evaluate the approach, the process, generate discussion within the projects and also to proactively involve the micro-community of the classroom and territory's actors. The theme of experimentation focuses on the recent drought in Piedmont, in order to design an ecosystem of interactive artifacts and speculating on what if a critical mass of people would adopt those interactive artifacts.

Introduction

During the last 20 years Speculative Design and Design Fiction have been increasingly used not only in the academic field but also among practitioners and companies as a technique or a tool to explore possible futures linked to the massive use of technology-driven products and services. At the same time, arts, fictions, novels and movies are continuously speculating about how the next future will be, questioning even on the Design value and its role in the crucial events the world is facing. On the other side, Interaction Design (IxD) is often considered as short-term problem solver, too technology-driven, because it developed during the years of strong growth and adoption of digital products; even if IxD aims to create meaningful relations between humans and should: have an agnostic approach to technology, be grounded on users' analysis, create human-human relations as the fulcrum of the project and generating artifacts as possible relational mediators (Germak, 2022). In this context, IxD usually follows a process mainly based on the double diamond (Design Council, 2019) which is articulated through well-defined steps: user research that ends with the generation of Personas, Scenarios (mostly goal-oriented), Journey Maps, generation of the concept(s) to be consolidated and tested through prototypes and mock-ups. On the contrary, Speculative Design and Design Fiction aren't still sharing a well-established process, probably relying too much on the designer's intuition or sensitivity,

especially during the first phases. Therefore, at first the paper analyzes the possible intersections that can enable a process that is – at the same time – based on a human-centred but also narrative-speculative approach, to foster researchers and students a high degree of critical awareness acquiring the fundamental skills of IxD.

Speculative design and design fiction methods

Starting from the 2000s, a series of approaches – which have now become real disciplines – made their way both in the academic world and among practitioners. Their aim is to shift attention not only towards problem-setting but, above all, towards a conception which sees Design as an activator of discussions (Norman, 2004), as a tool to provoke and involve communities and territories, with the desire to increase the awareness degree regarding the possible impacts of an extensive use of technological objects in daily life. These disciplines are named Design Fiction (Bosch, 2012), Speculative Design (Dunne & Raby, 2013), Critical Design (Dunne, 2005), Adversarial Design (DiSalvo, 2012) and many other branches. It is often difficult to find clear separations, to the point that Auger (2013) suggests that the chosen name derives mostly from the intentions that the project aims to put in evidence. Even the outputs can spread from artifacts, defined as diegetic prototypes (Sterling, 2009), exhibited in contexts such as exhibitions (Changeist, 2022) or used in participatory workshops open to citizens (Rüller et al, 2022), to short stories (Desjardins & Biggs, 2021), small theatrical pieces (Ventä-Olkkonen et al, 2021), short videos (Stals et al, 2019). In order to create these prototypes, artists, researchers and practitioners from the world of humanities are increasingly involved in the process. This allows not only to bridge aspects which are not characteristic of Design training, such as writing or screenwriting, but really makes the projects more open, broad, engaging, especially when the prototype refers to fields not too much covered by Design skills. These considerations derive from the awareness that art, in which we can also include fictions, novels and sci-fi movies, is able to show possible futures with a force, an engagement and a degree of verisimilitude capable of bringing spect-actors (Floridi, 2012) and designers towards a reflection on the value of Design. The design education in Interaction Design could benefit of the adoption of this approach, above all in order to experiment new relational methods (Bistagnino, 2009), even during the design process, starting from a micro-community as a design class is. The fictional-speculative approach could also provoke the debate from the very beginning of the process between designers and other actors involved. Furthermore, the elements of critique should be underlined, discussed and worked – not properly taught – in every step of the process to stress each speculative consequence of an interaction.

The fictional and speculative disciplines are relatively young, projects and articles date from the turn of the century: the cornerstone book of Speculative Design which collects previous works is dated 2013 (Dunne & Raby, 2013), the first book that praises of being a Design Fiction manual (Bleecker et al., 2022) was published very recently. Despite this, although the number of projects and scientific publications is constantly increasing – the number of publications on the scientific libraries shows exponential growth going from 5.477 in 2000 to 35.008 in 2023 (ACM Library, 2023) –, it is difficult to identify shared methods. Only three examples are reported below, the most cited in the literature, in order to show how different are the processes and even the used wording. The process described by Grand and Wiedmer (2010) includes: creation and construction of possible future worlds; materializing those possible future worlds; plurality of different

perspectives and approaches; representing, visualizing, documenting the experimentation processes; experimentation as being generated through an experimental system. Instead, in the Manual of Design Fiction, the steps are a bit different and reorganized: collect faint signals, select an archetype, present stimulus materials, extrapolate from signals, identify the "what if", know your tropes, design workshop, make the thing!, disseminate. This method includes a starting phase which is similar to a research phase, even if is not so structured, furthermore the choice of the archetype happens immediately after and depends on the skills of the designers.

On the other hand, to reconstruct the speculative design process, it is necessary to rely on its elements, its characteristics, generating: fictional worlds, utopias/dystopias, extrapolation: neoliberal speculative fiction, ideas as stories, thought experiments, reductio ad absurdum, counterfactuals, what-ifs, fictioneers in denial (Dunne & Raby, 2013). Therefore, if the motivation is clear (i.e. generating a constructive and informed debate), if the possible fields of interest are consolidated but not limited (i.e. politics, privacy, food and genetic mutations), if features continue to be explored and discussed (i.e. use of humor (Helms & Fernaeus, 2018)), if the outputs can have very different formats and often very far from the original concept of tangible prototype, the process appears to be not sufficiently explained. In this way, the possibility itself to test hypothesis stands on a debate or discussion that should generate a kind of short- or medium-term impact inside the community or all around the world. The debate is also open on some specific crucial aspects. The need to create a worldbuilding – that supports the discussion on prototypes with a sufficient degree of verisimilitude – is widely shared, however some scholars deny the need for narration and storytelling, relying on rhetoric (Coulton et al., 2017). Others, on the other hand, rely on narration or the creation of a story (Blythe, 2017). Still others, including examples of science fiction films among the case studies, use an opposite diagram based on two axes to catalog the projects, but at the same time to provide a guide for the fictional/speculative meta-design (Johannessen, 2017); the axes names are: narrative based-object based; alternative presents-speculative futures (FIG1).

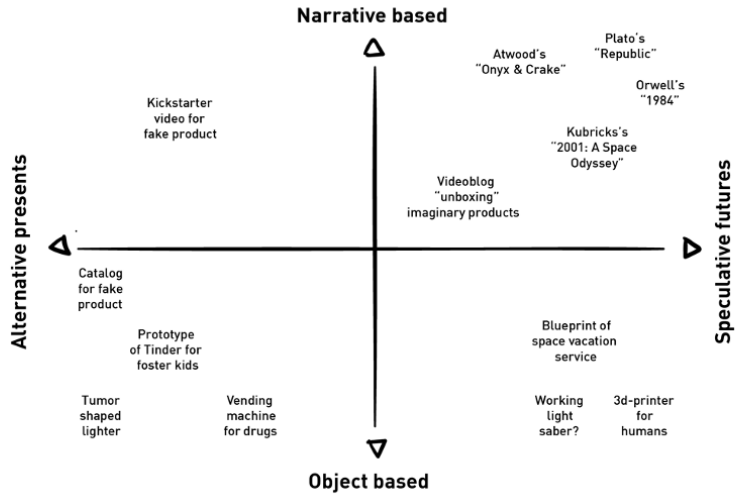


Figure 1. Johannessen schema (2017) on practice uses scenarios in the speculative future or alternative present, which materialize as narratives or objects.

After verifying the lack of shared methods in the research works presented in the literature, the next section focuses on the actual methods used to teach fictional and speculative approach in order to get insights on the actual situation.

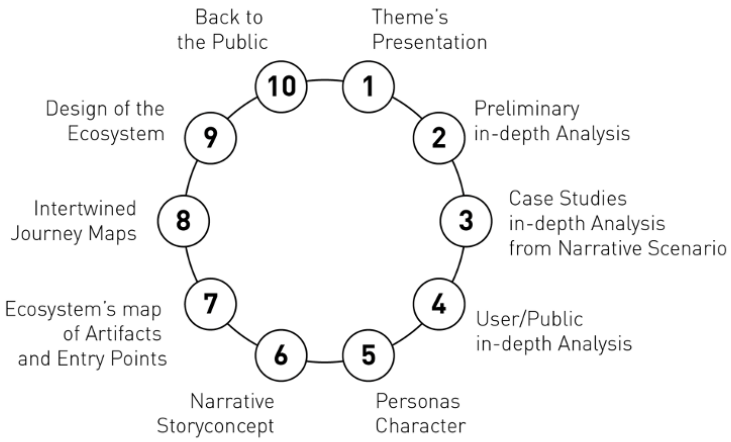
Fictional and speculative education

In order to verify the pervasiveness of the fictional and speculative approaches and better understand the possibilities in the educational field, the author carried out a literature review on a basis of over 90 articles found on the main scientific libraries, published in the last 15 years using the queries "design fiction" + "education" and "speculative design" + "education" (list available at: urly.it/3-dnp). The 15-year period was chosen to include as much as possible the works starting from the first texts on the disciplines of Design Fiction and Speculative Design. This research joins others in progress, for example, on the role of narration which analyses over 100 papers; these reviews highlight the difficulty in finding a shared process, that is rarely expressed and described. In fact, after a declaration of the chosen approach (speculative, fictional or both the two), it is customary to describe just the mode the scholars used. The most used mode is usually a co-creation workshop (over 60 articles), in which researchers involve selected categories of people to generate new ideas and discuss on them; but sometimes scholars directly jump to the choice of the prototype to be designed without giving any information on the previous phases. This underlines how often the scientific community uses Design Fiction or Speculative Design instrumentally, as generators of new concepts without stringent constraints, as if they were a creative technique (Stein, 2016); or better as an activator of discussions on specific topics of a project. In this last way, it is possible to evaluate in advance, even on behalf of private companies, the possible reactions of the public and the buyers in the face of radical technological innovations, as happens for the IKEA Catalogue (Brown et al., 2016) or in research phases that are concerned with ethical aspects (Lupetti et al., 2018). These practices are now widespread. Dunagan et al. (2019) described one of the very few examples in the literature of a didactic process, the theme of the course refers to Experiential Future and belongs to the galaxy of future studies – not too dissimilar from Speculative Design and Design Fiction – in which Candy's experiential futures ladder is adopted (2010). In the same fields other useful suggestions come from the work by Barbara and Scupelli (2021). It is useful to also mention a specific case study worthy of note, namely the publication by the speculative.edu project (Mitrovi et al., 2021). The chapter entitled "methods, approaches and tools: ambiguity tensions and scopes" rather than highlighting methods shows how the tension between opposing elements is able to generate speculation of value and project spaces. The tensions are: exclusion (human-kind); engagement (participant-witness); use (prop-product); completion (process outcome); gain (learn-earn); perspective (local-global); time (past-future); inclusion (non-Human). If the last two sections of this paper tried to highlight the lack of shared methods in general, and in particular in education, the next section illustrates the experimental process designed by the author, in order to: include the fictional-speculative approaches inside the IxD methodology to foster IxD towards critique and awareness; to integrate speculation as a dialogue from the very beginning.

The adopted process

The process is based on an evolution of the one proposed by the author (2024) and revised to further explore the speculative and discursive aspects in all steps within the micro-community. The process follows the steps illustrated in Figure 2.

Figure 2. The adopted process.



Theme's Presentation. It is not a real brief, but instead the mandatory outputs of the project are clearly declared, that is, an ecosystem of interactive artefacts prototyped in form and interaction (interaction could be simulated if the level of complexity is too high); an immersive website that tells the story of the project and the process (it is in effect one of the entry points of the narrative); a short video built in 3D animation that integrates people and artifacts (it should be a narrative video, not a descriptive one). The choice of the 3 outputs derives from the setting of the module which includes 3 courses and 3 teachers that give classes to those topics. The theme chosen for the experimentation is drought. The choice was made to avoid speculating on topics that could be perceived as too futuristic, almost sci-fi. In fact, during the course year (2023), the data was alarming, the rivers of the city where the university resides were dry, the days without rain had exceeded any previous record. Furthermore, the choice of the theme is also well suited to the attitudes and expectations of the students who expect great importance given to the theme of sustainability.

Preliminary in-depth Analysis. Each student has a week to do initial research on the topic and communicate it concisely through a podcast of 2 minutes maximum. It is a first survey to understand how students perceive the phenomenon, how they frame it and tell it using one of the most current narrative and synthetic methods. To better understand these data, the author used software (atlas.ti) for text analysis in order to track the most used words, how they were connected, find co-occurrences and sentiment analysis. The results of this analysis show a clear relevance of words related to water and the environment in general, with a clear predominance of the term "climate change" (Figure 3).

Furthermore, the software detects a neutral sentiment in almost all the 58 cases, a fact confirmed by the empirical observation that in only 2 cases students used music to underscore the words. Each student was then asked

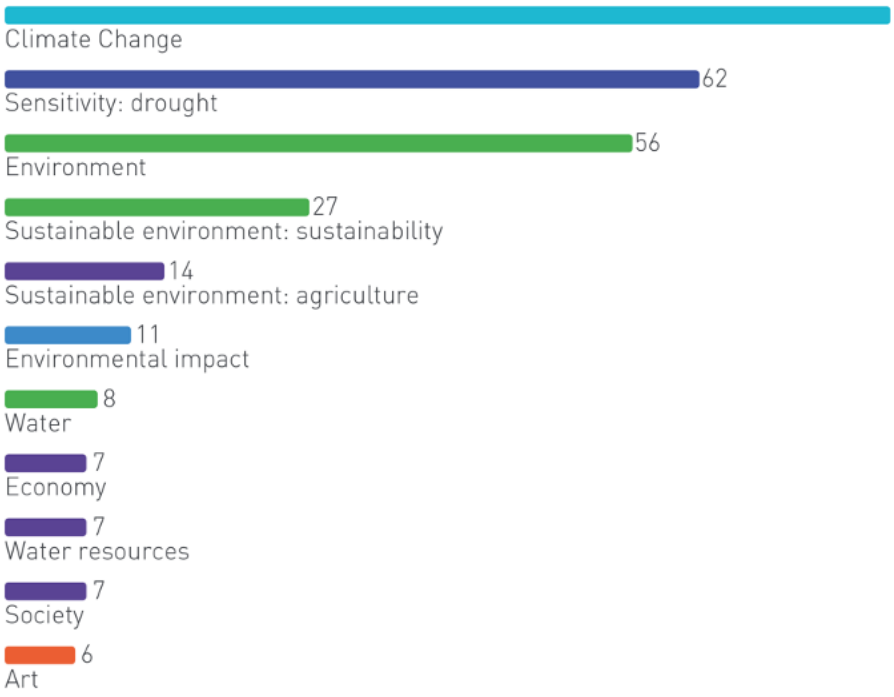


Figure 3. Analysis made through atlas.ti to better understand the most used words and sentiment analysis.

to analyze at least 10 podcasts of their colleagues using as criteria: the type of podcast (Catch-up, Interview, Free-talk, Narrative podcast, Scripted, Hybrid); the vision (Utopian, Positive, Neutral, Negative, Dystopian); the tone of voice (cold (technical, formal and bureaucratic), neutral (professional, dreamlike), warm (friendly, colloquial) and colorful (irreverent, provocative and ironic)); the emotions it arouses (2 at most among those proposed by Plutchik); describing the podcast through 4 keywords. The results of this analysis appear quite consistent with what was found by atlas.it, with almost all narrative podcasts (56 out of 58), a neutral or negative vision, a tone of voice that oscillates a lot between the different podcasts precisely due to different personalities of the students, a complex series of emotions highlighted in figure 4, on which interest and apprehension stand out.

Starting from this data, both teachers and students delved deeper into what had already been produced on the topic, both in a scientific and fictional-speculative way.

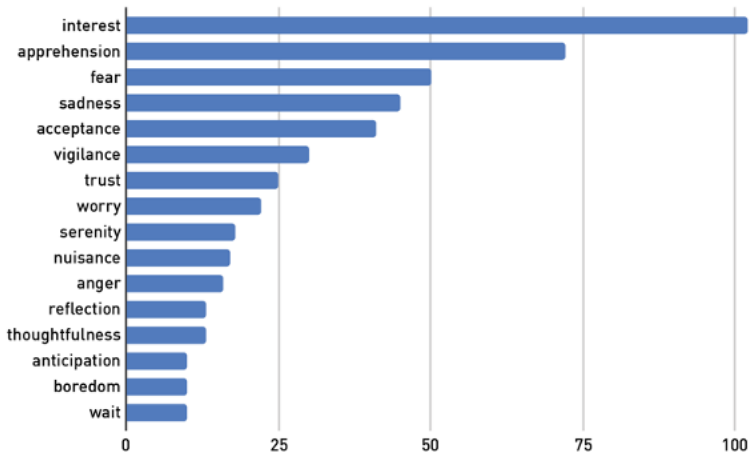


Figure 4. Analysis of the emotions felt by students analysing podcasts.

Case Studies in-depth Analysis from Narrative Scenario. Students divided into working groups and each group chose at least 20 case studies, including not only cases relating to design but also everything that can enable possible interpretations and representations of drought, from purely technical-technological ones, to those of Social Design, documentaries, installations, art and much more. At this time, it is not required that the case studies belong to Design Fiction or Speculative Design. Each group must then present the results of the research, collected in a digital book, to the entire class, highlighting not only the interaction but also the possible aspects of critique and trying to speculate on their hypothetical massive use. In this phase, the whole class collaborates in searching for information and generating outputs that constitute a sort of shoulders of giants to climb on. The analysis criteria agreed bottom up with the class are: the main information (year, place, author), the typology, the keywords capable of connoting the case, the writing of the story concept in reverse, the identification of the narrative form following the 7 plots of Booker (2004).

In the analysis, the author noticed how the main origin of the case studies corresponds to Italy and the USA, while for all the other nations there is a notable dispersion. This highlights how students looked for examples located in their country of origin or where those are in greater numbers. In the literature it is often noted that the speculative approach is typical of the western Europe and US, the data confirms it. The analysis of the typologies shows a dominance of films (including documentaries), a conspicuous quantity of works of art, performances and installations, with a good presence of Product Design. The data that emerges both in this analysis and in that of the keywords is, however, a low percentage of interactive artefacts.

The possible explanation is that the interaction could be often considered as part of the performances or installations without being predominant. If an analysis of the total recurrence of the keywords shows a strong impact of the term sensitization, awareness, change and sustainability, however, if a clustering is carried out into 4 categories (type of output, strategy adopted, tools, methods of connoting/describing) the most used keywords being are obviously the ones used to describe and connote the phenomenon of drought, followed by those which declare the strategies to deal with and therefore the tools. Lastly, the typologies. This highlights that drought can have multiple consequences on a territory at different scales, while possible strategies are still limited. The plots are all represented at the same level, except for Rags to riches, probably because the theme lends itself little to such a narrative arc (Figure 5).

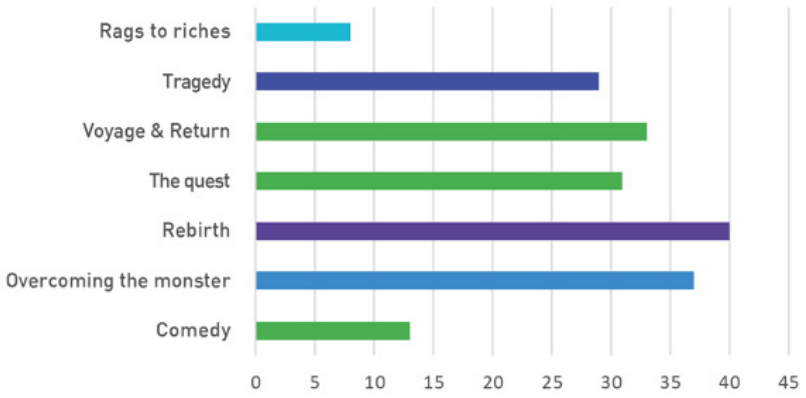


Figure 5. Analysis of the plots used and identified by students to communicate through podcasts.

Starting from this research, students and teachers had a clearer picture not only of the phenomenon but also of the way in which it was represented, described and addressed by disciplines similar to or more peripheral to the world of IxD.

User/Public in-depth Analysis. Starting from the observation that Speculative Design and Design Fiction do not have users in a strict sense, but users could be considered as a participating public, students and teachers drew up a questionnaire with the aim of understanding what the perception of the drought phenomenon was, what emotions it aroused, whether the people interviewed felt involved and how they would have reacted to the situation. Furthermore, each student interviewed 1:1 in a semi-structured way at least one person who had experienced the phenomenon of drought first-hand, for example in agriculture or in areas where water is rationed. The result of the quantitative analysis (647 questionnaires filled out online through a Google form to which one was invited via email, sharing the link on social groups or through word of mouth) highlights (Figure 6,7) specifically a level of information on the phenomenon that is not high, but a clear perceived importance, an overwhelming majority of negative emotions (including 50% who declare anxiety). Other very interesting data concern the possible strategies that seem to suggest a high responsibility of the administrations at all levels, which should therefore guide the population more by taking advantage of adequate education. The answers inserted to these last two items, the numbers of those who trust in technological development, but – above all – that one who would change habits to improve the lives of the next generations, strengthen the need of long-term strategy and community if guided by the administrations.

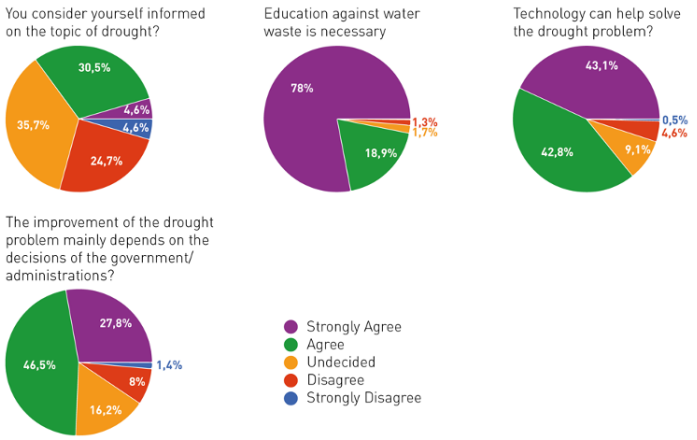


Figure 6. Insights from the online questionnaire.

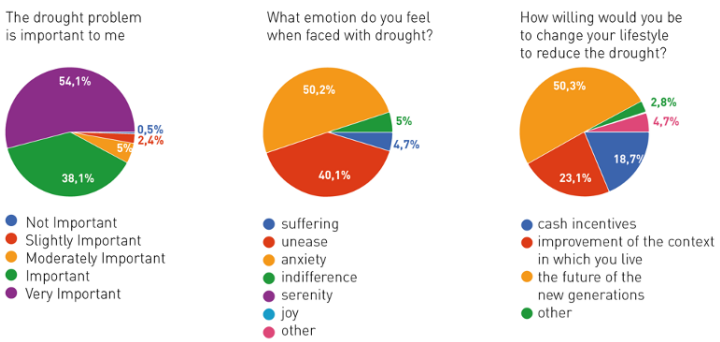


Figure 7. Insights from the online questionnaire.

Personas-Character. The result of the quantitative analysis and the approximately 130 interviews allowed the students to generate 3 personas per group. These personas are defined as character personas because they must be able to tell a story, avoiding not only stereotypes but also the excessive schematization that usually accompanies personas. The result therefore consists of a series of short data-driven stories which have the double role of creating and remembering the empathy found in the 1:1 interviews and of suspending disbelief precisely because of the many data obtained, but above all they allow – in meaning of the public – to be able to better identify expectations, emotions and communicative-narrative strategies typical of Speculative Design and Design Fiction which have not been explored in depth so far.

Narrative Story concept. Next, each group has to produce 5 story concepts in what-if form, also with the help of a set of cards called Dixit Journey. Each story concept is represented in the form of a sentence of up to 30 words in interrogative form, to allow open endings and an image that represents it in an abstract way, which does not derive in any way from previous research. The whole class is then asked to read and vote on the story concepts, helping each group to self-elaborate the most promising design path, that is not only the ones that includes interesting interactions but also the more engaging speculations.

The remaining points remain very similar to the characteristic aspects of IxD: map of the ecosystem of artifacts with entry points; intertwined journey maps, design / prototype of the artifacts and the interfaces; back to the public i.e. the discussion with people who demonstrated their interest during the survey and the interview. In these phases teachers act as facilitators during the discussion, giving advices only when is necessary to refers to the pillars of the disciplines, it is of course an iterative phase but teachers tend to avoid to stress errors in order to foster the discussion, the critique, the speculation.

Process Results

The following figures show 3 of the 9 projects presented by the students; the selection aims to highlight not the best projects, but those which respected the process phases the most.



Figure 8. Project: Helle. To survive, a new appliance is needed, which not only causes humidity to precipitate from the air but also makes it drinkable, pleasant, enriched with new flavours. A luxury product with an aesthetic that recalls some perfectly designed hi-tech products, with natural and playful interactions, but which has a service behind based on the exploitation of people, territories, precious materials and therefore of the entire society. Is the model sustainable?



Figure 9. Project Vision. The surgically implanted third eye is all we need to self-monitor our use of resources, to constantly question objects, products and services on their sustainability, to even be able to share the amount of water given to each person to survive. The eye communicates with our brain but also with a centralized apparatus, it seems to support sharing, but will those really be the desired outcomes?



Figure 10. Project Junko. Being hydrated with pure water is true wealth. Access to social places depends on an interactive screen that tests people's saliva and allows entry into the community. Added to this are the new models of ostentation of one's social class, i.e. water jewels and strategies to cheat tests, such as chewing gum that promises to purify saliva and digital applications that connect the accepted and the rejected. What will be the new beauty model? What is the new sense of belonging?

Conclusions and future work

The didactic goal succeeded in fostering the knowledge of IxD in several aspects, generating a critical awareness about technologies and behaviors throughout the Design process; instead, the research showed the main limits of narrative and fictional aspects, if applied to the whole process, mainly concerned to verisimilitude, feasibility and territory's involvement. The latter happens because people interviewed during the first phase expected a more problem-solving project, so – through semi-structured interview – they expressed interest in the projects especially from the creation of consciousness and awareness for the public, but even if they could interact with artifacts, they would like to have kind of ready to market objects.

At the end of the courses, the students filled out an anonymous questionnaire, different from the one requested by the university, in which they were asked to evaluate the process and to verify how it helped, or not, them in building the project. The results of the questionnaire confirm for 80% of the answers that the process was interesting and unusual for them (note that unusual is different from innovative), the 75% consider themselves more aware after the course about the issues of Design and technology, however they underline the difficulty in clearly distinguishing sci-fi from Design Fiction aspects. 57% of the students are convinced that they have designed in a fictional and speculative way, 35% believe that they have generated projects more oriented towards the sci-fi world. From the point of view

of teaching, it was often difficult to demonstrate to the students that this process, even if it did not have a high TRL (Technology readiness level), was able to respect all the pillars of the disciplines involved. Moreover, students evaluate the methodology as strongly based on generating relations between people (89%), capable of designing artifacts that critically address the design process (79%), this data appears encouraging regarding the process. The future work from the point of view of research is, according to the author, first to structure even better especially the steps relating to concept generation in which the narration can take over towards solutions that are too sci-fi. Second, the creation of the relations between students has been often very encouraged by teachers using online tools such as Miro, giving students time and space to free discuss without hierarchies. Sometimes it worked well, sometimes the discussion was poor; a next step to sustain the discussion – and therefore the critique and the awareness – should be the design of a process or a toolkit that could better help the students letting them free to discuss but also independent during that phase.

References

1. *Auger, J. (2013). Speculative design: crafting the speculation. Digital Creativity, 24(1).*
2. *Barbara, A., & Scupelli, P. (2021). Teaching to dexign futures in cities. In TECHNE Special Series Vol. 2. Firenze: Firenze University Press.*
3. *Bistagnino, L. (2009). Design sistemico: Progettare la sostenibilità produttiva e ambientale. Bra, Cn: Slow Food Editore.*
4. *Bleecker, J., Foster, N., Girardin, F., Nova, N. (2022). The manual of Design Fiction. Venice: Near Future Laboratory.*
5. *Blythe, M. (2017). Research fiction: storytelling, plot and design. In Proceedings of the 2017 CHI Conference on Human Factors in Computing Systems.*
6. *Bosch, T. (2012). Sci-Fi Writer Bruce Sterling Explains the Intriguing New Concept of Design Fiction. In https://slate.com/technology/2012/03/bruce-sterling-on-design-fictions.html [12.01.2023].*
7. *Brown, B. et al. (2016). The IKEA Catalogue: Design fiction in academic and industrial collaborations. In Proceedings of the 19th International Conference on Supporting Group Work.*
8. *Candy, S. (2010). The futures of everyday life: Politics and the design of experiential scenarios.*
9. *Changeist (2022). Changeist. In https://changeist.com/ [12.01.2023]*
10. *Coulton, P., Lindley, J. G., Sturdee, M., Stead, M. (2017). Design fiction as World Building. In Proceedings of the 3rd Research through Design Conference.*
11. *Desjardins, A., Biggs, H. R. (2021). Data epics: Embarking on literary journeys of home in-*

ternet of things data. In Proceedings of the 2021 CHI Conference on Human Factors in Computing Systems.

12. *Design Council (2019). Framework for Innovation: Design Council's evolved Double Diamond. In https://www.designcouncil.org.uk/our-work/skills-learning/tools-frameworks/framework-for-innovation-design-councils-evolved-double-diamond/ [13/01/2023]*
13. *DiSalvo, C. (2012). Adversarial design. Cambridge: MIT Press.*
14. *Di Salvo, A. (2024). Interaction and Verisimilitude. How Narration Can Foster the Design Process. In: Zanella, F., et al. Multidisciplinary Aspects of Design. Design! OPEN 2022. Springer Series in Design and Innovation, vol 37. Cham: Springer.*
15. *Dunagan, J., Draudt, A., Hadley, J. J., Hogan, R., Murray, L., Stock, G., & West, J. R. (2019). Strategic foresight studio: A first-hand account of an experiential futures course. Journal of Futures Studies, 23(3).*
16. *Dunne, A. (2005). Hertzian Tales: Electronic Products, Aesthetic Experience, and Critical Design. Cambridge: MIT Press.*
17. *Dunne, A., & Raby, F. (2013). Speculative everything: design, fiction, and social dreaming. Cambridge: MIT Press.*
18. *Floridi, L. (2012). La rivoluzione dell'informazione. Torino: Codice Edizioni.*
19. *Germak, C. (2022). Design mediator between humanism and technology, in technical culture and humanistic culture: the Turin case. In: ATTI E RASSEGNA TECNICA, vol. LXXVI, pp. 63-67.*
20. *Grand, S., & Wiedmer, M. (2010). Design fiction: a method toolbox for design research in a complex world. In proceedings of the DRS 2010 conference: Design and Complexity.*
21. *Helms, K., & Fernaeus, Y. (2018). Humor in design fiction to suspend disbelief and belief. In Proceedings of the 10th Nordic Conference on Human-Computer Interaction.*
22. *Johannessen, L. K. (2017). The young designer's guide to speculative and critical design. Trondheim: Norwegian University of Science and Technology.*
23. *Lupetti, M. L., Smit, I. and Cila, N. (2018). Near future cities of things – Addressing dilemmas*