Interactive narratives are growingly establishing as popular and flourishing means of entertainment, proving to be a compelling and rather challenging field for various investigations. Indeed, nowadays more than ever, narratives emerge as complex and articulated subjects of research and experimentation, rooted in different epistemologies and investigated by various disciplines. Under specific and different perspectives, from narratology, communications and literary studies, to computer science, digital media studies and game studies, but also cultural studies, film and performance studies, psychology and fine arts in general, interactive narratives are objects of research in multiple fields [1]. Their potential and extended range of application make them a regular object of enquiry in many areas, as well as an important element within the contemporary design curriculum in the communication domain. Acknowledging their paramount role in communication and its design, as well as the fact that narratives move across different media [2], [3], we present and discuss a design methodology for conceiving interactive narrative projects based on character-driven stories, and its evolution through time.

Since the AY 2015/2016 (and ongoing), we challenged the MSc design studio “Complex Artefacts and System Design Studio”, a class with communication and interaction design students which are not used to deal with interactive narrative or transmedia logics, to design stories embedded in communicative projects able to trigger reflection on social issues or convey set of values. Hence, we approached the interactive narratives field as a relevant area for experimentation where in-training
designers can experience the design process as a hands-on activity based on trial-and-error cycles. The very nature of these narratives makes them inclusive of the different degrees of complexity that characterize the design processes, and therefore, from a design education perspective, an ideal context for exploring the phases and challenges of conceiving such artefacts.

1.1 From immersion to agency, across media

Over the years, a growing body of scholars and practitioners described good narratives as the ones that allow users to immerse [5]–[9] and suspend their disbelief [10]–[12], getting somehow lost within the story depicted. If on the one side this results in a sort of escapism from reality, on the other, it allows to discuss what is portrayed in a detached and unbiased way, as a form of reflective criticism. Our reasoning is indeed based on the potential that comes from building imaginary worlds [13] that allow users to vicariously immerse in fictional stories that transport them momentarily in "other places", where they can go through extraordinary experiences.

Furthermore, the affordance of contemporary digital media allows users to play more active roles than in narrative forms that we can consider and call "traditional". In fact, to different extents, users can be provided with agency, a fundamental property of digital media, which can manifest itself in various forms within interactive narratives [14], [15]. The concept of agency is as familiar as discussed when dealing with games and other playable media [16], [17]. However, this concept, which was framed by Murray [7, p. 126] and Buckles [18] respectively, as (i) equipping the player with the power to perform significant actions and see their results, when (ii) feeling effective in interacting with the surrounding environment, is as crucial as it is challenging in terms of design. In fact, the agency as a way of empowering the user to interact with the fictional world in which it is immersed translates into a considerable amount of variables – and hence complexity – that can turn into potential and problematic exit points from the narrative flow.

Both the concepts of immersion and agency have been discussed in Murray’s influential Hamlet on the Holodeck [7]. In her work, the author also points out the inherent procedural and participatory nature of digital media, highlighting their capacity to push audiences to cross the single-story boundaries. Capitalizing on such potentialities, we witness nowadays more than before that a growing amount of stories is designed to be distributed across media [2], [3], feeding new consumption behaviours that ground on actively engaging and involving users. Then, among the contemporary practices, there is also the ongoing attempt to challenge the threshold that transports narratives into the real world [4], [19], favouring perspectives of inclusion and presence. In the narrative field, especially when aspects of gaming are included, practices of hybrid experiences are spreading, i.e. activities in which the real and virtual overlap. It is these possibilities of hybridization and formal contaminations, fed by the possibilities of new media, that encourages experimentation. Aiming at furtherly nurture experiences that are holistic and meaningful requires to pay particular attention in terms of consistency and coherence [13].

Considering that by expressing and reducing situations, events, and systems as pieces of the world, narratives follow a logic of meaning-making that is largely based on rebuilding knowledge from experiences and interpretation [20], [21]. From a communication design perspective, designing narratives goes beyond mere storytelling [22]. It means using stories to cover a specific issue or set of values, conveying specific meanings, questioning matters of social interest, opening political debate. In so doing narratives are not meant to present a solution, but rather to challenging ethical reasoning on the argument at stake, as many issues are actually wicked problems [23]–[25]. Therefore, we look at interactive narratives recalling Goffman’s concepts of reduction and keying [26, p. 79], that is to say as opportunities to open up perspectives and represent scenarios that activate existing or potential interactions, allowing in the meanwhile to reinterpret aesthetics and explore new media affordances. In so doing, they empower the audience to experience and understand those systems represented, often even questioning their logics. It comes without saying that designing interactive narratives of such a kind requires a certain sensibility as well as method.

1.2 Interactive narrative and design curricula: a through-design process for design education

From interactive drama to narrative games, the field is alive and prosper. Following and being aware of such premises, interactive narratives as articulated and challenging ecosystems include different degrees of complexity, resulting an ideal space to explore the possibilities and challenges of design education. As confirmed by its literature and state of the art, interactive narratives as an
interdisciplinary object of study are still in need of experimentation, in particular in-field. Indeed and above all, especially when it comes to design curriculum, we recognise that activating a punctual ruminaton on how to built interactive narratives as complex systems. Acknowledging that, and leveraging on the fact that interactive imaginary worlds empower their viewers/users/players (VUP) to take action within the story, it is of great importance to investigate the implications and possibilities of dealing with different media, each characterized by its own features and affordances, also in a transmedia logic. In so doing, we consider crucial to pay particular attention to designing interactive narratives seeking for a good equilibrium between agency and experiences that are coherent, consistent and satisfying. An aspect that various fields of reference recognize as one of their ultimate, paramount challenges [16], [28]–[31].

Taking into major consideration the opportunities that come from media implies to deepen the reasoning about the implications that come along [32]. In consequence, we asked in-training designers to conceive and develop their projects as complex ecosystems, often transmedial, where several elements coexist and interact, smoothly and meaningfully. That said, we structured this study as a design-through research where hands-on activities led and encouraged students to experience the various degree of agency and interactiveness toward the story that different media allows. Then, relying on the knowledge and expertise from narrative theory, cultural, media and game studies, we asked to leverage the possibilities that come from analog and digital media, but also from their being hybridized. In so doing, we challenged the rather spread tenet that interactive narratives are predominantly digital [29], [31]. In the light of this reasoning, we built a longitudinal through-design study that enquires the pros and cons that stem from starting the design from different narrative elements: 1) archetypal characters (AY 2015/16), 2) thick and compelling storyworlds (AY 2016/17), 3) real testimonies shaped as short stories and fragments of memories (AY 2017/18).

**EXPERIMENTATIONS**

![Figure 1: The three starting points adopted to design interactive narratives.](image)

Among the elements that foster the audience to vicariously enter the storyworld, characters stand as particularly remarkable since they act as points of access to narratives [33], [34] that sustains and encourages identification and projection [35]–[37]. Despite the specific typology of the story told, building characters means identifying the basis for the creation of a set of potential stories, with the aim of involving the audience. Playing such a foundational role, characters have the power of transforming a passive telling in a personal, even sharable experience. The empathy between the user and the fictional character is then an important trigger in terms of agency. Therefore, transversally to the three experimentations conducted, we asked to consider characters as repositories of stories and values, and therefore to design them as elements able to activate on the one hand the understanding of specific, inner meanings embedded in the character itself, and on the other hand to trigger reflection – through a practice of reduction [26] – on the values of entire socio-cultural contexts [38]–[40].

## 2 METHODOLOGY

Aiming at deepening our knowledge on how to develop meaningful concepts of interactive storytelling, starting from the spring semester 2015/16, classes of about 50-60 students were involved in a practice-based, through-design research. Starting every year from a different, given narrative element, students build fictional storyworld able to host various characters and storylines. Broadly speaking, the teaching activity consisted of (1) introduction and discussion on fundamentals of narrative structure, transmedia design and enactive media, (2) screening and critical – as much as possible collective – analysis of paradigmatic examples related to the specific topics addressed in the lessons, (3) first individual, then group work using tools specifically designed to encourage the design process, (4) presentation of the final project with a working prototype, collecting feedback from peers.

In order to comprehend how different narrative elements can feed the design process of construction of interactive narratives, testing their potential and problems, for every edition of the course we have
identified and experienced a different, specific starting point. Below we list the ones of the first three editions, as the fourth is still in progress.

1. From March to June 2016, a class of 59 students developed interactive storytelling concepts starting from the creation of a character inspired by the statues on the Dome of Milan’s facades, using Tarot cards as a set of potential meanings and values.

2. From March to June 2017, a class of 45 students unpacked and reframed given storyworlds starting from Italo Calvino’s Invisible Cities [41]. In the process, they were equipped with a set of tools developed to support both storytelling practice and storyworld creation [30], [42].

3. From February to June 2018, a class of 63 students developed character-driven interactive narratives starting from given testimonies, shaped as written or representative stories. In this case, a further tool named Interactive Narrative Architecture diagram has been developed to support students in shaping the interactive structure of their projects.

To understand and compare the effectiveness of the different methods in triggering learning and feeding knowledge, as well as to explore their potential in terms of design education, we observed the design(er)’s storytelling and world-making experiences conducting each time a four-months ethnography and a participant observation (moderate participation) [43]. Moreover, at the end of every course students are required by our university to fill a questionnaire in which they are asked to anonymously provide their opinion on the design studio, focusing on its teaching activities and learning outcomes. As leading teachers of the design studio, we receive a course statistical report presenting a visual and tabular analysis on each teaching. We are also provided with an additional collection of qualitative feedback with positive and negative aspects as well as suggestions and proposals to improve the quality of the course. After each experimentation we relied on the report and the feedback to revise elements for the next edition.

3 RESULTS

As described above, since 2016 we have conducted a hands-on experimentation aimed at observing how starting from different narrative elements impacted on the students’ learning process, and therefore on the design process. As educators dealing with complex systems, we started working not only on the process but also on providing students with specific tools aimed at empowering the knowledge around the narrative field. The result is a collection of design tools that can be used in design processes that deal with complex (interactive) narrative systems. According to that, the proposed methodology was supported by a set of tools aimed at a specific design activity: the construction of characters, stories and storyworlds (Fig. 2). Each tool proposed was previously developed and tested within both educational and research activities leading by ImagisLab research group (Department of Design, Politecnico di Milano).

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Figure 2: The methodology and tools used to design different narrative elements and their evolution over the three years.
3.1 Experimentation #1. From archetypes to characters

The first year of experimentation (AY 2015/16), students were asked to develop character-driven interactive stories starting from the statues on the Dome of Milan’s facades. Since the communication design students were unfamiliar with narrative concepts beforehand, we proposed a design methodology and a set of tools to ease the approach of the designer to storytelling and world building. We chose Tarot as a character-driven narrative engine for creating *dramatis personae* [44]. Challenging the complexity of the writing activity with nonexperts, we proposed a three-fold process:

1. We initiated with an immersive guided tour at the Cathedral and its museum, allowing students to experience the Dome and its apparatus of sculptures as an ancient system of storytelling. According to the stories told by the statues, each student chose a character present on the facades. Students started a personal background research on the chosen fictional/factual character to narratively develop and built it making use of Tarot – especially the Minor Arcana system – as a tool. [Tool: Tarot deck]

2. The second phase was devoted to the identification of clusters from which develop a storyworld with its stories. Inspired by the interpretations attributed to their Dome characters made use of Donaldson’s Bardic Technique [45, pp. 18–19] to form groups in line with the representations of their Minor Arcana cards. [Tool: Bardic Technique]

3. Then students started designing their own project and producing working prototypes, developing the storyworld and its stories in the meanwhile. [Tool: Storyworld Canvas]

After the Dome visit, we started using the *Tarot deck* as a storytelling system, and in particular as a character-driven narrative engine. Far from the common use of Tarot as a system to unveil the hidden story and investigate the inner self, we proposed the students to apply the Minor Arcana system to the development of compelling characters. Challenging its common use, we looked at the Tarot deck as a sort of instrumental system functional for designing characters: a grid of archetypal values and behaviours. Raising from the card a set of values, potentially able to initiate infinite stories, students developed their own version of the Minor Arcana cards. We provided a poster with a grid containing all 56 Tarot deck cards and their meaning. According to their Minor Arcana, each student posed their own character in the provided grid. Each group was required to identify the characters’ Transformational Arc [46], leading them to consider their intentions and drivers. Then we asked students to provide a visual to the Minor Arcana, making a summarizing A5 card for each character with a short bio as a storyline, and visual representation. Each card/character was then presented in front of the class and collectively discussed in order to make a critique of the outcome and the values represented.

The following phase made use of the *Bardic Technique* [45] to team up students relying on the narrative consistency of their characters. In *The Castle of Crossed Destinies* [47], [48], Calvino used Tarot as a narrative experiment where illustrations are used by characters as visual aids to build and communicate their own storylines. According to the Bardic Technique, inspired by the interpretations attributed to their Dome characters, students made design teams in line with the representations of their Minor Arcana cards, conceiving interactive narrative structure as a consequence. To support the interactive narrative design, we equipped students with the so-called *Storyworld Canvas* [30], [42]. The tool leads students to make a qualitative description of the created imaginary world, following seven items identified by Pinardi and De Angelis [49]: *topos* (environment), *epos* (background story), *ethos* (value system), *telos* (life goals & objectives), *logos* (language), *genos* (system of relations).

The course resulted in nine interactive narrative projects. Even though the characters and their storylines were well defined, some problems remained in terms of structuring the interactive narrative as an overall system, and create synthetic characters shaped in a believable and meaningful way [44]. Each group built the main structure of the overarching story, however, we observed a general lack of cause-effect connections between the narrative itself and the user experience, probably due to narrative structures that were not deeply developed.

Therefore, while the learning-by-doing approach worked out in providing students practical knowledge about how to build interactive narrative systems, the set of tools used resulted not fully functional to help students in understanding and hence structuring the contents of their stories. The use of Tarot as a character-narrative engine was instrumental to the development of relatable characters, but it didn’t properly function as a suitable tool when it comes to supporting students in the design of consistent interactive narrative structures. One of the main challenges was indeed building the storyworlds starting from characters. In fact, we obtained fascinating interactive artifacts with interesting levels of
agency, that did not succeed in conveying the story imagined and the values students wanted to transfer.

As a consequence, we decided to start the following experimentation from stories that embedded richer storyworlds, introducing the Story Map tool for supporting them in writing their stories.

### 3.2 Experimentation #2. From stories to storyworlds, and backwards

According to the results obtained, the second year we asked the class to unpack and reframe given storyworlds. As a starting point, we chose Calvino’s *Invisible Cities* [41]: a collection of 55 fictitious cities told by the explorer Marco Polo to the emperor Kublai Khan. We chose Calvino’s book because of the multifaceted levels of meaning it contains, as the fact that each city portrayed can be read as an allegory and reflection on the nature of human experience, from culture to interaction, language, time, memory, and death. In this iteration, we started from the imaginary cities to develop character-driven storylines to be distributed across multiple channels, exploiting the interaction and the audience engagement. The method was based on three phases:

1. The students grouped in heterogeneous skill-based teams picked one of the 55 short stories, clustered in eleven thematic groups by Calvino, unpacking them following the items of the Storyworld Canvas tool to re-frame them as new storyworlds. [Tool: Storyworld Canvas]

2. Students were asked to individually design their own character within the fictional world created relying on Vogler’s archetypes [50], providing a textual storyline, a visual representation in the shape of a moodboard, and defining their mutual relationship according to the aforementioned archetypes [50]. It was an individual assignment that forced them to consistently take into consideration the work of the other members of the group. [Tool: Character Wheel; Vogler’s archetypes]

3. To shape the interactive narrative structure, students were asked to design the spreading of the character-driven storylines across the media, accordingly to a communication aim and a specific audience. [Tool: Story Map]

Working on the issues emerged from the previous experimentation, we started the narrative development from the storyworld itself (instead of the character design). To do that we equipped students with the aforementioned Storyworld Canvas. Then, to develop characters it was used the Character Wheel, helpful in identifying their inner and external worlds – where the first refers to the age, gender, ethnicity, nationality, physical and mental skills, and personality, while the second to the character’s environment (where she/he lives), social class, civil status, religion/beliefs, education, work experience, habits, physical appearance, and favorite activities. In parallel, we asked them to make explicit the archetypal roles and relationships among characters [50]. The aim of providing these two tools was supporting the definition of each character at a deeper level, defining its background story, personal motivations, and drivers as objectives.

In order to sustain and feed the process of writing the overall story, in which the singular characters’ narrative braids are included, we provided students with the Story Map tool. It uses the theory of equilibrium [51], creating a basic narrative structure with four main parts: 1) initial equilibrium, presenting context and characters; 2) disruption, as the part in which conflicts emerge; 3) resolution, as the moment in which conflicts are fully or partially resolved; 4) new equilibrium, as the establishment of a new stability.

The second year of the course produced eight interactive projects. This iteration showed us how narrative by itself represents a design issue, and as such it requires a systemic approach of ideation, planning, and production, in order to find the right balance between narrative content and structure. The set of tools provided was generally perceived as helpful and supportive in the overall design activity, even though we noticed some problems with the Story Map tool. Indeed, the extreme simplification of the tool proved not to be suitable to handle the complexity of an interactive narrative project. Concerning interactive narratives, if splitting the story according to Todorov [51] works in terms of content development, it does not allow to designerly unpack any reasoning regarding the audience’s agency, that is to say designing the various levels of interaction between users and the storyline(s). These reflections lead us to introduce a more structured tool that we named Interactive Narrative Architecture. Moreover, from this second iteration, nurtured by the contemporary possibilities in terms of interaction and participation, it emerged the desire of experimenting new forms of hybridisation, taking advantage of different media and their affordances [32]. As a consequence, students underwent the practice of building stories embracing a transmedia approach.
3.3 Experimentation #3. From storytelling to worldbuilding

To push forward our research, in the third experimentation (AY 2017/18), we asked in-training designers to develop character-driven interactive narrative projects starting from given testimonies. The course was part of a granted research project Cascina 9 (www.cascina9.polimi.it), a co-design project of social innovation for sharing knowledge, stories and creative productions coming from migrants and refugees. The process followed a bottom-up creation of storyworlds [52] from real stories and testimonies shaped in the form of miniatures or short texts, developed by the students of the association Asnada (asnada.it) during a previous workshop. The process consisted of three steps:

1. The students group themselves and picked up one of the twelve testimonies selected. After the analysis of the text, designers in-training highlighted the pivotal values emerged from the story picked, building an imaginary world. [Tool: Storyworld Canvas]

2. According to the team storyworld developed, students individually developed their own characters employing the Character Wheel and the Story Map, identifying their characteristics and storyline, and visual representation (moodboard). [Tool: Character Wheel; Story Map]

3. To build the interactive narrative concept and produce of a working demo, defining media, touchpoints and interactions, students used the structure framed in the Interactive Narrative Architecture. [Tool: Interactive Narrative Architecture]

Recognizing that tools can be seen as creative constraints, we also acknowledge their being functional when dealing with complex artefacts, as projects that entail entire storyworlds and narrative braids. In this specific case, in addition to the Story Map, which is used for the development of characters' storylines, we designed a tool able to support students in understanding and designing the audience’s agency. The Interactive Narrative Architecture encourages students to describe in a synthetic way the branching story structure and the multiple pathways permitted. Although there is not a standard format for this tool, since it could assume different configurations, it is usually shaped as a decision tree with several levels aimed at outlining contents, media, and touch-points in which the audience can take actions and interact. The intent at the basis of this tool is pushing communication designers to think about not only the distribution of contents, but also the agency of the audience, especially across media. Despite the difficulty of using a tool without a defined visualization, but rather consisting of a set of elements to be integrated into a multi-level tree diagram, depending on the project needs, students have proved to be able to use it in a conscious and agile way. In fact, we noticed that the absence of a predefined form encouraged students to reflect on the structure and learn how to best represent the complexity of the design object.

4 CONCLUSIONS

The present study is mainly positioned in the communication domain, and analyses interactive narrative from the perspective of design, offering a methodology and a set of tools to help designers in training to conceive and produce interactive narrative projects based on character-driven stories. From distributed narratives to narrative games, interactive narrative projects are challenging the communication ecosystem introducing further degrees of complexity. In doing so, it stood as an ideal space to be explored within the domain of the design education. Hence, we approached the interactive narrative field as an area where young designers can experience a through-design learning process based on theoretical debates and hands-on activities based on trial-and-error cycles.

The course presented multiple objectives, including in-field testing a design methodology with specific processes and tools for the different phases of construction of narratives. In particular, recalling the learning taxonomy presented by [3], through the experimentations we asked students to master often tangled topics through design processes, activating a formal learning on how to design complex interactive narrative artifacts that go across media (L1), embed meanings and convey values (L1+L2), aiming at activating significant experiences in those who consume such stories (L3). These projects were indeed designed in the communication domain as ways to portrait situations, discuss certain topics or even expose the logics beyond specific systems, purposing to encourage reflections.

In the following, we further advance the discussion already proposed in the specific paragraphs. In general, characters were seen as holistic narrative entities, through which is it possible to enter vicariously the narratives. This established a situation in which the interactive narrative field has became a space of experimentation not only for the entertainment (where a growing number of projects deals with controversial themes), but also for the social good domain, tackling ethical and
moral issues in an engaging way. The first year of experimentation we posed our focus on the role of characters in fostering the audience engagement, establishing an empathic relationship with people. From the point of view of design education, the challenge was empowering the students to design characters as narrative entities and holistic elements. Tarot became a narrative engine for character building: functioning as a grid of archetypal and behaviours, they were used to develop the storyline according to the evolution of the character as a hero with his/her journey. Although the characters obtained were rounded and well-designed, the worlds built lacked in invention, completeness, and consistency [13]. As a consequence, for the second and third iterations we rearrange the phases of the methodology and added new tools.

Both Calvino’s Invisible Cities [41] and migrants’ and refugees’ testimonies, shaped as short stories, were used as triggers for the world building activity, acting as a powerful narrative design boost. Moreover, we provided students with two tools for the definition of the characters at a deeper level, in terms of motivation, reasons, and storylines. While the in-training designers perceived the instruments developed as helpful and supporting within the design process, the resulting outcomes were still unsatisfactory looking at the interactions between the audience and the narrative interactive artefacts. We detected a significant improvement from the first to the second iteration, but still, the audience interaction and engagement with the narrative projects remained vague: a big issue when designing narrative interactive artefacts that are meant to allowed people to act with stories and storyworld. This led us to add a tool aimed at representing a decision tree with contents, media, and touch-points for the interactions. In that case, we decided not to provide a standardized format for the tool, leaving the communication design students free of shaping it accordingly with the specific aims of the projects.

To conclude our analysis, combining the knowledge gathered during the ethnographic analysis and the information obtained from the evaluation reports and feedback forms provided by our university, we confirmed that the learning activity chiefly covered three main areas. First, looking at storyworlds, characters and stories according to an interactive system logic, the students’ learning activity consisted in a practical-based awareness on the relationships and dependencies among a narrative topic, its structure, and the VUP role, especially considering paramount concepts as believability, agency and immersion. As a consequence, in terms of language and media, students could gain experiential knowledge of what it means designing narratives that spread across media and include audience participation. As a matter of fact, the main design issues regarded the definition of meaningful interactions among the VUP, the media, and the narrative. Especially in the first experimentation, although students knew that interactive narratives should be grounded on achieving consistent and coherent interactions, we observed that the way in which their complex artefacts have been designed resulted often lacking the expected depth and hence perceived as ending in themselves. Just in the last experimentation we managed to tackle the issue by introducing a tool that forced students to unpack the complexity in its several levels resulting functional and effective in supporting the design of sound and consistent narratives. This reasoning is connected to the third area in which we achieved significant learning results, that is the one of interactive narratives’ rhetorics of expression. Such narratives, independently of the medium or media they use to be consumed, should be windows to broader systems of meanings/values, framed into a storyworld.

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