

# EDUCATING FOR CRISIS PREPAREDNESS THROUGH DESIGN STORYTELLING

Ole Edward WATTNE and Brita Fladvad NIELSEN

The Norwegian University of Science and Technology, Norway

## ABSTRACT

Preparing and designing for crises is an essential cross-disciplinary skill. This demand teaching methods that unite students from different fields and equip them with systematic tools to imagine, plan, and act to improve citizen preparedness. Across a series of workshops, we tested the well-established ‘personas and scenarios’ method with both design and non-design students to support storytelling, situational forecasting, and empathy with potential users. This article presents a pedagogical reflection on a case study that explores the use of personas and scenarios as tools for actionable storytelling in design education. It examines how effective this approach is in contexts that involve the interaction of people, technology, and crisis situations. We present methods, results, discuss student feedback, and argue that this approach can be adapted to a wide range of disciplines working with disaster preparedness and technology innovation.

*Keywords: Design methods, design education, design storytelling, crisis preparedness, forecasting*

## 1 INTRODUCTION AND BACKGROUND

The ongoing *polycrisis* of natural and man-made disasters demands that we, as educators, prepare future generations and equip them to empower people and communities in the face of disasters [1-3]. From a citizen’s perspective, navigating uncertainty requires understanding how people think, feel, and act, what past experiences they draw on, and which resources they can access during a crisis. Such resources may include technology, individual skills, and relational assets like social capital. To imagine different crisis scenarios and simulate how situations might unfold toward potential solutions, we need to explore and test various scenario-based formats in a learning environment. Using personas and scenarios in the way specified by Cooper [4] can be seen as a form of ‘proxy’ or surrogate user-representation, where a persona is established to represent a user profile based on our knowledge about a demographic segment. Followingly, a persona is a profile representing a particular group of people, such as a group of customers or system users, a market segment, a subset of employees, or any other stakeholder group. Using personas is also an effective way to anonymize data while retaining inherent complexity, and for communicating and discussing human experiences with interdisciplinary teams for problem-solving, design or forecasting.

### 1.1 Epistemological viewpoints on personas and scenarios and forecasting

Situated within qualitative epistemology [cf. 5], personas and scenarios remain contested because their accuracy cannot be verified and they rely on perceived credibility rather than just empirical facts [see for example 6]. Their intentionally fictitious nature also prevents scientific falsification, and even when supported by data, they can never be conclusively validated. These critiques highlight tensions between realist and socially – and narratively – constructed epistemologies. Their capacity to enhance designers’ empathy is likewise debated, as personas may unintentionally reinforce bias, misrepresent user groups, or reduce real-world engagement and testing. While acknowledging these limitations, we focus on their effective use in educational settings [cf. 7], particularly for development of design narratives and forecasting. Here, ‘future forecasting’ refers to using research-based insights to anticipate and shape emerging conditions through qualitative and quantitative signals rather than fixed predictions. Futuring methods, including visual tools that map temporal relationships, facilitate reflection on long-term sociopolitical and ecological implications. Because design lacks a standardised trend-forecasting methodology, multidisciplinary collaboration and scenario planning remain essential for developing resilient and adaptable future visions. [8-10]. Design educators highlight scenarios as valuable for

training students to design future products and services, while other researchers note their usefulness in preparing crisis managers. Moats et.al. (2008) [11] similarly emphasise the role of technology and scenario planning in supporting local decision-making and crisis management. In design education specifically, scenario building is identified as a core method for teaching students to ‘design futures’ and for fostering civic engagement [12-14]. Perspective-taking is fundamental to design – especially human-centred design – because it helps reduce bias and supports the identification of the ‘right problem’. Well-executed human-centred approaches are associated with improved productivity, quality, user acceptance, error reduction, and lower development costs [15-17]. Designers may involve end-users directly or represent them indirectly through personas, which help scope user segments early in a process. Co-creating personas can also strengthen organisational learning and inclusiveness [18]. Ultimately, anticipating how people will behave, interact with a design, and experience future contexts is central to all design activity. Storytelling is integral to constructing user scenarios, which Cooper [4] describes as an extension of persona creation. Cooper frames this as a form of role-play in which designers adopt the perspectives of their personas to empathise with them and narrate their encounters with a system, service, artefact or other future conditions. These stories may extend from basic interactions to broader descriptions of future ‘preferred situations’, in Simon’s terms [19]. In this case study, we show how combining personas with scenario development helps students construct stories about possible future situations, particularly those involving people, technology, and natural or human-made crises.

## 2 RESEARCH METHOD

This study aims to offer a replicable example for teaching, accompanied by qualitative pedagogical reflections within the context of interdisciplinary crisis preparedness education, rather than presenting a quantitatively driven, evidence-based assessment of impact. Our study is hence a descriptive case study presenting an approach developed for – and tested in – an educational setting involving both designers and non-designers, hereafter referred to as the Workshops (WS). Because crisis preparedness relies on interdisciplinary collaboration, we applied this approach with a mixed group of students [20, 21]. The cases described consist of four workshops: **WS 1** (2024), involving 20 international full-time Erasmus Mundus students in Portugal with varied backgrounds; **WS 2** (2024), involving 22 international full-time Master’s students in Portugal; **WS 3** (2025), involving 24 full-time Master’s students in service, technology, and interaction design in Norway; and **WS 4** (2026), involving 20 international full-time Erasmus Mundus Master’s students in Norway. After each WS, students completed an anonymous online survey containing both fixed-response items and open-ended questions for qualitative feedback. Based on these cases, we present our experiences teaching design and non-design students how persona creation and scenario development can be used to forecast crisis situations from a human perspective. We outline our storytelling approach, describe the workshop structure, and conclude with lessons learned regarding tool relevance, student responses, and areas for improvement.

### 2.1 Storytelling about crisis scenarios

Across four half-day workshops with students we used personas and scenarios to support actionable storytelling. The students learned to create plausible narratives by adopting a character with specific abilities and resources, identifying a challenge, proposing an improvement, and explaining how it becomes possible through context and available technology. Focused on crisis scenarios, the workshops introduced four variables: **crises, people, disabilities, and technology**. Crises – natural or human-made, such as hurricanes, wildfires, earthquakes, floods, crime, terrorism, cyberattacks, pandemics, or conflict – may be short- or long-term and can be understood through three phases: pre-crisis, active crisis, and recovery [22, 23]. Although the workshops focused on situations requiring immediate individual response, students were free to explore interventions across all crisis phases. Together with the students, we also identified groups likely to be affected – such as local residents, children, the elderly, tourists, non-native speakers, refugees, and displaced or homeless individuals [24]. The aim was to expose students to the potential diversity of people impacted by crises and their differing needs, fostering empathy for individuals whose circumstances differ from their own. Because vulnerability is central to humanitarian response, we integrated varying vulnerability levels into the exercises. This reflects growing expectations that public and private services support at-risk individuals through inclusive ‘Leave No One Behind’ approaches. Awareness of vulnerability is therefore essential for designers and related professionals both in education and future practice. [25]. Accordingly, we specified that the

people students should consider may have temporary or permanent disabilities, ranging from behavioural and emotional conditions to sensory impairments, physical disabilities, brain injuries, respiratory disorders, and developmental disabilities such as ADHD, cerebral palsy, autism spectrum disorders, or learning disabilities. Building on the range of crises and user characteristics, we then introduced *technology* as another element, using the modern smartphone as a familiar and accessible example. By highlighting its diverse input, output, and sensing capabilities, we encouraged students to recognise the technological resources available to their personas before developing their scenarios.

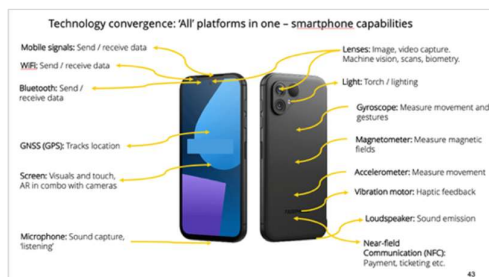


Figure 1. An illustrated overview of smartphone hardware capabilities as described and used in the workshops

Students worked in groups to identify a crisis scenario based on their own lived experiences, preferably one they had directly or indirectly encountered. After selecting a crisis, they chose a target user segment and created a feasible, credible persona. Using this persona, they then developed a realistic scenario set within the chosen crisis and described – through visual and verbal storytelling – how a smartphone and its capabilities could support the persona in that situation. The workshops were structured as rapid design processes aimed at producing design narratives, with defined time frames for each task: **Step 1, 10 minutes:** *Share stories from your home place, or memory, of a crisis event. This can be natural or man-made catastrophe. Decide on using one of the situations shared in the group as a starting point.* **Step 2, 20 minutes:** *Decide which segment of the population (from demographic variables) you want to focus on in your design. Create a persona based on this segment. Include at least one disability as a part of the characteristics of the persona.* **Step 3, 20 minutes:** *Identify and brainstorm how the smartphone can be of use for the persona in this crisis-situation. Write and draw together a story describing this scenario and how the persona can use the smartphone in the crisis.* Between steps 1 and 2, groups briefly presented their work, and after step 3 they shared their final stories. Because each step had strict time limits, students relied mainly on existing knowledge in the group to create credible personas, scenarios, and narratives. Although they could search online or use AI tools, the short timeframe encouraged them to draw primarily on shared insights. This distinguishes this method from standard persona and scenario development, which typically relies on extensive research and diverse datasets. We refer to our adapted approach as ‘rapid design for storytelling and empathy’. After each workshop, students completed a short anonymous online survey. A total of 49 responses were collected. The purpose of this feedback was to support ongoing evaluation of the class in order to enhance the student experience and foster an interactive learning environment in which students could share their perspectives. The responses are used to inform pedagogical reflection and guide improvements of teaching practices. However, it is important to note that this feedback is not intended to serve as scientific evidence of the method’s impact on student learning. Assessing outcomes such as increased empathy, reflection, or depth of learning would require additional approaches beyond a single, one-time survey. The students rated the exercises highly for their usefulness and for helping them empathise with the people in their stories. They also expressed interest in applying these methods in their future work. Scores were somewhat lower regarding how much the exercises prompted reflection on their role as designers, and the more general claim that they ‘learned a lot’ received slightly lower ratings as well. In the qualitative comments, students were asked what worked well, what could be improved, and whether they had additional feedback. Table 1 presents some selected responses.

Table 1. Displaying some of the written answers from the survey

| What worked well? | What could be improved? | Any other comments or feedback |
|-------------------|-------------------------|--------------------------------|
|-------------------|-------------------------|--------------------------------|

|                                                                                                                           |                                                                    |                                                                 |
|---------------------------------------------------------------------------------------------------------------------------|--------------------------------------------------------------------|-----------------------------------------------------------------|
| <i>The fact that we can exchange ideas about possible solutions for the segment we want to reach</i>                      | <i>it could be longer and involve some research</i>                | <i>This class has made me more interested in service design</i> |
| <i>The explanation about all the functions on the smartphone was really helpful! Some of them are not that well known</i> | <i>More time to explore the background of the persona</i>          | <i>I really liked the theory part of the workshop</i>           |
| <i>hands on creation of designing personas</i>                                                                            | <i>Explain more Why and how it relates to humanitarian action.</i> | <i>thank you !!! it was very rewarding</i>                      |

### 3 RESULTS: DESIGN OUTCOMES AND REFLECTIONS

WS 1, 2, and 4 included diverse international cohorts of non-design students, while WS 3 consisted mainly of students with design training, alongside a smaller group without such backgrounds. Across all workshops, participants drew on crisis experiences from varied geographical and personal contexts.



Figure 2. Students developing scenarios during workshop 4

All students produced high-quality outcomes that were diverse, realistic, and well presented. The results from the first WS exceeded our expectations given the short time available, and this performance was repeated in the subsequent WSs. Students were highly engaged in sharing knowledge and used scenario-based storytelling to explore innovative ways smartphones could support disaster victims. Below, we present two synthesized, example stories.

#### 3.1 Example story 1

*Fátima is 30 and lives in a refugee camp with her young children. She's an artisan, selling the items she crafts to others in the camp. After losing part of her hearing in an explosion while fleeing her home, she relies on her smartphone. She posts daily stories and markets her work through social media, and her phone keeps her connected in other ways too: it flashes and vibrates if her baby wakes up out of sight, and it alerts her to nearby military incidents. When talking with customers who speak other languages, she uses her phone to translate messages. Most news and updates about camp life also reach her through her phone, making it an essential tool for staying informed and keeping her family safe.*

#### 3.2 Example story 2

*Miquelina is 84 and lives alone in the Aveiro region of Portugal. Thanks to a local police program, she's learned how to use her smartphone and smart bracelet if a wildfire breaks out. One day, a fire creeps toward her area, and her phone flashes and speaks a warning. She unlocks it with face recognition, which quietly tells emergency services she's home, safe for now, and aware of the alert. If the situation gets worse, Miquelina can simply press her phone's main button three times. That triggers a distress signal, shares her location, and opens a video and audio link to emergency operators, automatically launching a rescue mission. If she doesn't trigger it but the fire escalates, her initial biometric confirmation ensures she's placed on the evacuation list, so responders know where she is without having to search for her.*

As shown, the students were able to produce realistic, life-like stories about their persona Fátima and Miquelina, and how a smartphone can support life in a refugee camp, and in an ongoing wildfire.

#### 3.3 The focus on technology, relational and contextual factors

Observations from the workshops suggest that using the smartphone as a technological frame offered a familiar technological basis for building scenarios. Students, regardless of background, understood how smartphones function and could draw on their own and others' experiences. Although phones provided

a practical anchor, many stories centred on the relational aspects of crises. Students often began by asking whom their personas would contact first, and who they had turned to the last time they needed information or guidance. They assumed that communication with another person would be essential for emergency decision-making. Connecting scenarios to familiar contexts and memories of crisis events also made the storytelling concrete and detailed. A diverse classroom proved essential for meaningful learning about preparedness. When students came from varied disciplinary, geographic, cultural, and gender backgrounds, they contributed a broader range of crisis examples and firsthand insights into how people and communities think, feel, and act during difficult situations. Such diversity also encouraged consideration of crises from multiple socio-economic perspectives, enriching the overall learning experience [26]. In our experience from the workshops, the technological component of the smartphone functioned like a catalyst for discussions and development of stories of crisis preparedness while still retaining a focus on people and their relations and communities as the main factors. The role of the smartphone as an enabler for, and mediator of, social relations and connections was evident in all the resulting design stories. This focus on relational aspects – and accordingly design [27] – was at the centre of all future scenarios, ranging from narratives of crisis in the form of refugee situations, displacement, earthquakes, floods and wildfires.

## 4 DISCUSSIONS

Actionable knowledge differs from traditional scientific scholarship by explicitly connecting theory and practice [28]. Although design practice routinely involves this type of knowledge, personas and scenarios can help make it accessible to non-design students. Many are familiar with analysing data but find it less intuitive to translate data into stories and proposals for improvement. Even so, we observed that interdisciplinary and diverse groups generated stronger and more relevant ideas, while the more homogeneous group of mainly design students of the same nationality in the third workshop showed slightly lower engagement and less varied storytelling, though our sample is too small for firm conclusions. While intentionally ‘breaking the rules’ of best-practice persona and scenario development – by giving strict time limits – we found the method remained well-suited for rapid design exercises in educational contexts, serving seven purposes: 1) Sharing experiences within participant groups. 2) Establishing a situation and context for the story. 3) Identifying stakeholders to design for, including demographic factors and potential disabilities. 4) Building empathy and awareness of people in specific emergencies. 5) Proposing design interventions that show how technology can help. 6) Using storytelling to forecast improved future solutions and increase awareness and preparedness for crises, and: 7) Encouraging reflection within groups and across groups through sharing results and stories. In sum, we believe the approach can contribute meaningfully to disaster preparedness.

### 4.1 Limitations and conclusion

These workshops functioned as bottom-up exercises in imagining and visualising future situations, with students pooling existing knowledge to generate propositional insights. The resulting stories about human-technology interactions in crises were realistic but not evaluated for feasibility, cost, privacy, or other second-order constraints. We acknowledge potential priming effects from the workshop framing predefined contexts, and participants’ memories or biases. However, the aim was not factual accuracy but the creation of imaginative, future-oriented concepts to support vulnerable users. Overall, the ‘rapid design’ workshops were productive and engaging, as reflected in student feedback, and effectively introduced storytelling as a design method in crisis-preparedness education.

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