# Shroom Cards: Playful Exploration of Human Positionalities for More-than-Human Design

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**Figure 1: Shroom Cards, a card game designed to explore and reflect on a concrete set of human roles and purposes in MtH design**

## ABSTRACT

This paper introduces Shroom Cards, a novel tool designed to engage with More-than-Human (MtH) design through playful exploration and reflection. Leveraging design cards and structured activities, Shroom Cards provides concrete starting points to practically engage with MtH approaches in design, such as embodying the roles and purposes of human and non-human entities. In this paper, we detail the design process, which includes Reflective Design Studio exercises to create positionality cards and incorporating playful strategies such as exploration, role-playing, and competition in the structured ideation and reflection activities. Initial testing of the Shroom Cards in an HCI design course students (N=23) shows that the cards and ideation activity effectively stimulate creative processes and diverse perspectives. However, challenges remain in fully adopting non-human viewpoints, suggesting that enhanced role-playing elements are needed for deeper engagement with non-human perspectives.

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## CCS CONCEPTS

• **Human-centered computing → Interaction design theory, concepts and paradigms**.

## KEYWORDS

More-than-Human, Design, Cards, Playful, Positionalities

## 1 INTRODUCTION

In More-than-Human (MtH) design, designers and researchers emphasize a shift from a human-centered view to design to acknowledging our connections with, as well as needs and active influences of, non-human entities (from animals and plants to fungi and even inanimate entities like AI and IoT devices) in design processes [23]. This shift criticizes our human-centered perspective to our existence that often leads to neglecting or exploiting non-human others for human needs [13]. Instead, MtH approaches advocate for a "Hybrid" perspective that positions humans and non-humans as integral components of interconnected systems, actively shaping our reality together [7, 24]. The translation of these approaches in design practices, however, varies significantly from targeting

designs by considering and emphasizing our interconnectedness to non-human entities [3, 20] to framing non-humans as co-designers by attuning to their active influences in shaping designs [8, 10], or by positioning non-humans as users to cater their needs [9, 17, 19]. These examples illustrate fruitful ways to engage with MtH design practices, but a comprehensive guide for designers to operationalize these nuanced MtH approaches in their design practice is still limited.

This paper addresses this gap by presenting a wide range of positionalities humans could embody in MtH design practices as practical starting points for individuals to explore and reflect on MtH concepts in design practices. These positionalities were identified through a Reflective Design Studio exercise that we conducted by creating MtH design concepts and elaborating on our assumptions and biases [12] we embodied regarding *roles that we allocated to non-humans* and the *purposes that we pursued* in our design processes. Through this reflective practice, we formulated "Shroom Cards," (Fig. 1) a set of design cards summarizing the positionalities in a compact form, accompanied by guidance for two playful activities - ideation and reflection-. By offering these as concrete and diverse starting points for designers and researchers to engage with non-human actors in design practices, our work contributes a playful approach to investigating MtH design practices. In what follows, we first describe the related work, then introduce the design process and detail the Shroom Cards kit. Finally, we report and discuss preliminary insights from a design exercise conducted by using the Shroom Cards in an ideation activity.

## 2 RELATED WORK

### 2.1 More-than-Human Design

Attempts to realize MtH approaches in the design processes have led to a variety of innovative design practices: For example, researchers explored designing menstrual care products with biomaterials following an MtH approach, highlighting how this perspective fosters an acknowledgment of the interconnectedness of humans and non-humans [20]. Similarly, designing interactive artifacts in collaboration with mushrooms and interactive technologies, Genç et al. [10] notes how non-humans are active partners in the design process. Another significant area of MtH design explores human-food interactions. Dolejšová et al. [8] showcase methods (i.e., crafting and speculation) that can be used to acknowledge the active influences of non-humans such as soil directly affecting the ingredients possible for designing human-food interaction. Human-animal relationships are also a subject of MtH design. Researchers explored interactive animal feeding stations that facilitate animal-human relationships through technology [3]. Researchers have also explored toys that cater to animal needs and experiences [9, 17, 19]. Furthermore, by reviewing such MtH design practices from the lens of theoretical underpinnings of posthuman theory, Nicenboim et al. [18] identify high-level dimensions that can be used to articulate MtH practices, e.g., by focusing on theories utilized, problems addressed, who is considered in the center of the design process, contributions the works aim and contexts of the design practices. Or in a panel proposal about MtH design, Coskun et al. frame approaches such as designing for and with non-humans [6] as broader lenses that could be embodied in MtH design practice. While these high-level perspectives and practical examples suggest some ways to engage with MtH design practice, we still lack a comprehensive guide that offers concrete directions to explore different interpretations of MtH thoughts in practice to support further exploration and reflection.

### 2.2 Cards as Playful Tools to Engage with Design Knowledge

Cards have been widely used in design as tools for inspiration, collaboration, and reflection. By translating complex design knowledge into a compact and playful format, card games enable designers to engage with abstract concepts concretely. In fact, design cards are ideal for these purposes and have been used to introduce information and sources of inspiration in compact, tangible, and easily recognizable forms, allowing for playful and collaborative exploration of ideas. For instance, [16] created design cards for playfulness, using strategies like turn-taking, social play, and rule-based procedures to enhance playful card exploration. Cards are also useful for fostering reflection on complex issues in design processes (i.e., joyful human-nature relationships [1], societal issues such as international justice [15], and inclusiveness [2]). The cards and playful activities are especially relevant for a comprehensive and practical understanding of the different nuances of MtH design engagements. Their ability to encapsulate and communicate abstract concepts of the MtH approach promises accessible and engaging ways for designers to comprehend what MtH perspectives might entail in practice. "Shroom Cards," specifically, aim to address a wide range of possible human-non-human interplay in MtH design practice by providing concrete starting points for designers to explore and reflect on.

## 3 SHROOM CARDS

The "Shroom Cards" (Fig. 1) kit aims to serve as both a generative and reflective tool, offering concrete starting points for designers and researchers to investigate, contest, and iterate possible practical implications of MtH approaches within design practices. It includes *Positionality Cards* summarizing the concrete human positions (roles and purposes) that might be incorporated in MtH design based on our Reflective Design Studio exercises (see section 3.1), along with *Empty Positionality Cards* for individuals to create new positionalities if needed. Moreover, it involves two *Activity Cards* for guiding individuals in using the cards in a playful manner to ideate new MtH designs and to reflect on their positionalities. Below, we describe our design process, detailing positionality cards and playful activities.

### 3.1 Human Positionality Cards

To identify potential positionalities in MtH design, we employed a Reflective Design Studio method within our Research through Design (RtD) [26] process. This approach integrated sketching activities and iterative discussions to generate conceptual designs [21] and to critically examine our own positionalities that drove our design process. Our Reflective Design Studio process began with a *conceptual design exercise* where the first five co-authors (individually) created design concepts for a "mushroom basket," chosen for its metaphorical significance and practical engagement
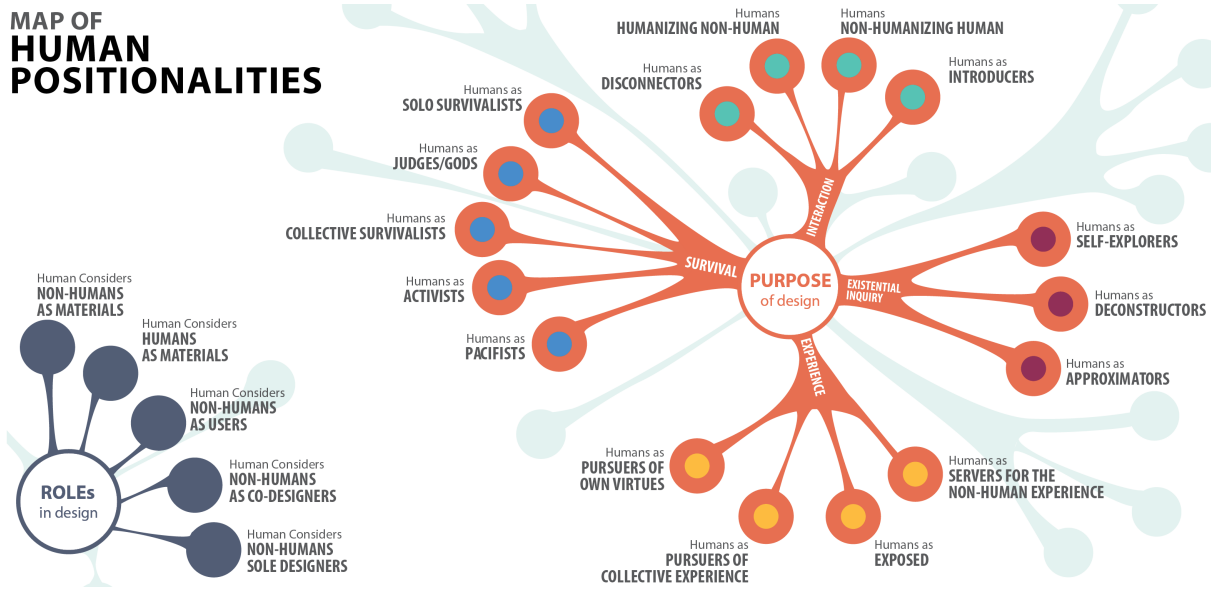
**Figure 2: An overview of human positionalities in MtH design**

with both humans and fungi. From influencing human health to being involved in brewing beer to their role in psychedelics, and even growing unexpectedly in our bathrooms [22], the deep intertwining of mushrooms and humans provided a rich context for exploring diverse designer positionalities in MtH spaces. Following this, collectively, we engaged in *collaborative deconstruction sessions* [12] to formulate our positionalities focusing on the roles we allocate to the non-humans and the purposes we pursued in our conceptual designs. These discussions led to the initial formulation of possible MtH positionalities based on our own and the creation of initial positionality cards as a concrete starting point for other researchers and designers to explore MtH design practice through. The next stage involved an *internal workshop* to generate new ideas and refine these positionalities, utilizing the initial cards to spark fresh discussions and uncover previously unrepresented positionalities.

The final set of positionalities we identified are categorized into two higher-level categories: "Roles in" and "Purposes of" MtH Design (see Fig. 2). The roles describe how non-humans are involved in the design processes, while the purposes describe what the design activity aims to achieve. Within these categories, the positionalities offer nuanced perspectives on human-non-human interactions, ranging from human-centered approaches to those that prioritize non-human agency. Below, we first detail the positionalities, by naming examples that can be a design outcome if an individual position is embodied and, then describe the card designs.

*3.1.1 Role Positionalities.* The "Roles Positionalities" category includes five positionalities that describe how non-humans are involved in the design process. These positionalities range from viewing non-humans as passive resources to recognizing them as active designers: ***Non-Humans as Materials***, where non-humans are seen as passive resources shaped by human designers, such as a flower pot made out of mycelium; ***Humans as Materials***, which views human bodies and minds as passive resources serving the

needs of non-humans, exemplified by wearable devices that allow mushrooms to grow on human skin, absorbing nutritious materials such as sweat or microbes living on the skin; ***Non-Humans as Sole Designers***, where non-humans are considered the sole designers without human involvement, like mushrooms creating their own forms and webs in untouched habitats; ***Non-Humans as Co-Designers***, recognizing non-humans as active collaborators alongside humans, such as a human-designed habitable fabric with mushrooms over it, defining its form and function by growing in different and unforeseeable ways each time; and ***Non-Humans as Users***, treating non-humans as the end users of the design, exemplified by a robot that moves in urban areas and helps mushrooms find habitable places.

*3.1.2 Purposes Positionalities.* The "Purpose Positionalities" category includes sixteen positionalities divided into four sub-categories, each describing a group of different end goals united under similar themes:

The *SURVIVAL* sub-category focuses on pragmatic approaches to ensure the survival of species. This includes ***Solo Survivalists***, who prioritize human survival at the cost of non-human existence, such as a basket that assists humans in exploiting mushrooms by spotting them with a camera; ***Collective Survivalists***, who aim for collective survival benefiting both humans and non-humans, like a basket that guides people to mushrooms while dispersing spores to promote mushroom growth on the way; ***Pacifists***, who refrain from designing to avoid impacting non-humans, exemplified by not designing at all to prevent human harm to non-humans; ***Activists***, who prioritize non-human survival even if it harms humans, such as a skin patch that attracts other humans to touch and helps yeast infections spread to other humans; and ***Judges/Gods***, who decide which non-humans to care for through design, exemplified by antibiotics that regulate the competition between yeast and lactobacilli in vaginal flora.
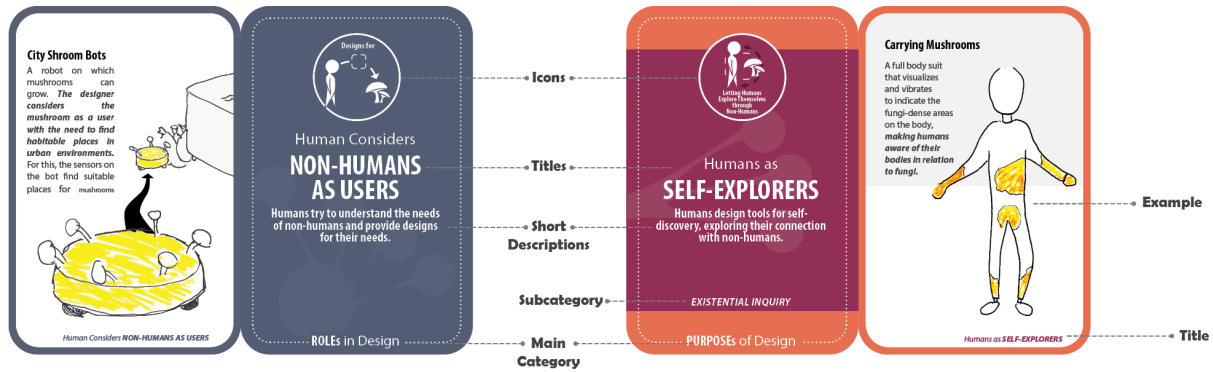
**Figure 3: Design of Position Cards**

The *EXPERIENCES* sub-category centers on the type of experiences aimed for in MtH engagements. It includes **Pursuers of Own Virtues**, who focus on creating pleasant experiences for humans, like fashion items that allow mushrooms to grow on the body to provide a unique fashion expression for the wearers; **Pursuers of Collective Experience**, who promote shared positive experiences between humans and non-humans, such as a robotic ball that creates a play experience for a dog and its owner; **Servers for the Non-Human Experience**, who create experiences solely for non-humans, exemplified by a set of distributed technologies, giving notifications to mushroom colonies when another colony gets bigger, to provide a competitive game experience for them in the forest; and **Exposed**, who reduce human control, allowing non-humans to define the experience, such as a wearable habitat for yeasts that induces itching experiences to the human wearer.

The *INTERACTION* sub-category examines how non-humans and humans communicate. This includes **Disconnectors**, who obstruct interactions between humans and non-humans, such as shoes that camouflage mushrooms via projecting camouflaging visuals on mushrooms to prevent humans from noticing and picking them; **Introducers**, who build communication channels between non-humans, like shoes that leave organic matter traces to attract worms to mushrooms; **Humanizing Non-Humans**, who allow non-humans to have human-like communication features, exemplified by an extended reality device that generates screaming sounds from the direction of mushrooms; and **Non-Humanizing Humans**, who enable humans to adopt non-human communication features, such as a synthetic skin augmentation that translates the electrical pulses of mycelium webs for humans to perceive.

Lastly, the *EXISTENTIAL* sub-category explores ontological perspectives of human and non-human connections. This includes **Self-Explorers**, who design tools for self-discovery and exploring connections with non-humans, like a full-body suit that visualizes fungi-dense areas on the body; **Deconstructors**, who create designs to reveal humans and non-humans as interconnected beings, exemplified by an installation in which black bags are put in places mushrooms were supposed to be in the forest to make humans reflect on the absence of mushrooms in their habitats; and **Approximators**, who help humans experience non-human perspectives through role-play or simulation, such as an extended reality

suit that lets humans experience becoming a fruiting body of a mushroom.

*3.1.3 Design of the Positionality Cards.* The positionality cards were designed to translate the different human positions identified in our Reflective Design Studio process into a concise, informative form. Each positionality card features a carefully crafted front and back to communicate positionalities and facilitate concrete inspirational starting points for MtH design practices (Figure 3). The front side of each positionality card includes an iconic representation of the position, a title, and a short description of the positionality. High-level categories are mentioned and color-coded on the front side, aiding in quick identification and organization. The Purpose cards are further divided into sub-categories, which are also color-coded and mentioned on both the front and back sides to provide additional clarity. On the backside of each card, an example from our conceptual designs illustrates how embodying positionalities might be manifested in MtH design practices. These examples serve as inspirational instances, with the influence of the positionality highlighted in italic text to emphasize its role in shaping the design outcome. In addition to the standard positionality cards, we also designed empty positionality cards. These cards maintain the same layout as the other cards, with spaces for individuals to add a title, brief description, example, and category for a new positionality they believe is missing from the deck. This feature allows participants to expand the deck by creating new categories if suitable ones are not found within the existing framework, fostering an open-ended and adaptable design tool.

## 3.2 Playful Activities

The Shroom Cards include two specially designed playful activities, Reflection and Ideation, aimed at facilitating deeper engagement with the MtH design space. These activities are designed to provide designers and researchers with structured yet flexible methods to explore and reflect on human positionalities in MtH design. By using these activities, participants can critically engage with and iterate on their own positionalities, fostering a more nuanced understanding of human-non-human interplays.
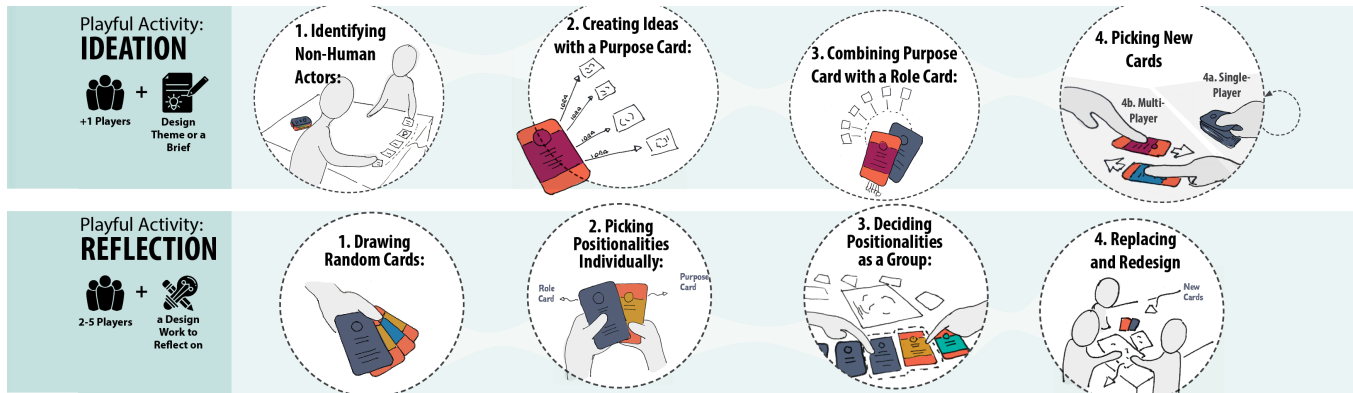
**Figure 4: Steps of Ideation and Reflection Activities**

*3.2.1 Ideation Activity.* The Ideation activity is designed to help designers generate new MtH designs by iteratively exploring different positionalities. This activity can be played by one or more participants and requires a design theme or brief to focus on. Here, while a theme might be a simple direction for the design activity (i.e., designing a forest technology or a playful wearable), a design brief may be a detailed description of requirements. The steps of the Ideation activity are: ***Step 1 - Identifying Non-Human Actors:*** Player(s) identify all the non-human actors that might exist in the context of the design theme or brief. A non-human actor can vary from living actors such as bacteria, plants and non-human animals to non-living actors such as Artificial Intelligence and the Internet of Things. ***Step 2 - Creating Ideas with a Purpose Card:*** Each player picks a random Purpose card, embodies it, and creates as many ideas as possible for the design context by considering one of the non-humans identified in 15 minutes. ***Step 3 - Combining Purpose Card with a Role Card:*** Each player picks a random Role card, combines it with the previously chosen Purpose card, and generates more ideas for another 15 minutes. ***Step 4 - Picking New Cards:*** Player(s) randomly picks a new card from the deck, replaces it with the one that they had in the same category and creates a new idea based on the new combination. This step can be done differently based on whether the activity is single or multiplayer: *In a single-player setting (Step 4a),* the player replaces one of their cards with a new one from the deck and continues generating ideas. This step is repeated until participants are satisfied with their ideas. *In group settings (Step 4b),* participants exchange one of their cards with each other and create more ideas based on the new combinations.

The ideation activity leverages playful strategies such as exploration [16] and role-playing [11]: It lets individuals embody different designer roles to create ideas and shift these randomly to foster exploration of many (*steps 2, 3* and *4*). Especially in a group setting, we envision that the same cards may be interpreted differently by different individuals (*step 4b*). While this would enrich the variety of design approaches in the ideation activity, strengthening the generative aspects of our tool, it might also let participants observe similarities and differences in their understanding of MtH positionalities, potentially providing a space for individuals to elaborate their own positionalities in relation to others.

*3.2.2 Reflection Activity.* The Reflection activity is intended to help individuals critically examine existing designs and reimagine them through the lens of positionalities. This activity is designed for two to five players and requires selecting a design work to reflect on. The design work can vary from an idea or sketch to a product or prototype. The steps (Fig. 4) of the Reflection activity are: ***Step 1 - Drawing Random Cards:*** Each player draws one role and three purpose cards randomly from the deck. ***Step 2 - Picking Positionalities Individually:*** The players review the cards they have at hand and select two positionality cards (one from Roles and another from Purposes) they believe are embodied in the design work and keep them for themselves at this stage. Participants can also create new positionalities if needed. ***Step 3 - Deciding Positionalities as a Group:*** The chosen cards are shuffled and placed anonymously on the table grouping roles and purposes together. Each player votes for one purpose and one role card, other than the ones they have chosen, considering their relevance to the idea best. The player whose cards were voted the most wins the round, though, upon the round they collectively discuss and agree on two cards (considering also the ones that are not drawn) that best represent the designer's positionalities. ***Step 4 - Replacing Positionalities and Redesign:*** The group replaces the selected positionalities with different ones and collaboratively redesigns the work based on these new positionalities.

This activity is inspired by the conversation game Dixit [14]. In Dixit, participants anonymously select and put cards on the table from a random set given to them based on their relevance to a given topic. They then vote to determine the winner who chose the most relevant cards. Similar to this, the activity engages participants with a particular design work through the lenses of our positionality cards: This activity lets participants identify MtH approaches in design practices by individually choosing randomly drawn to them or creating positionalities (*Step 1*). Then they vote and discuss, creating competition and revealing frictions among participants (*Step 2*) as a way to playfully comprehend, discuss and contrast positionalities.

## 4 PRELIMINARY FEEDBACK & DISCUSSION

We tested Shroom cards with the involvement of 23 students in the scope of the Interaction Approaches Course. The students were

given the design brief for designing "playful wearables for more-than-human interaction." This was part of a three-day workshop-type course where students designed their projects through activities such as brainstorming, bodystorming, video sketching and experience prototyping. Students used Shroom Cards in the brainstorming phase in a group ideation session alongside a framework for playful wearables as outlined by [5]. The session lasted around 1 hour.

Initial feedback from the students was mostly positive. The Shroom Cards' ideation activity effectively jump-started the creative process. While initial ideas were not necessarily playful as the theme suggested, the cards helped students begin from a MtH perspective and later adapt their ideas to the playful wearables framework. Students appreciated that the cards "helped to open up your mind to other ideas because the topic of non-humans is new and it helped think about non-human perspectives." They valued the multiple perspectives presented and were enthusiastic about using them in future design cases. Furthermore, although the students were instructed to play the ideation activity, many students used the cards iteratively, reflecting on their initial ideas and adapting them to better fit the selected positionality cards, which matched the intended use of the Reflection activity.

However, students found it challenging to grasp the variety of perspectives in the cards quickly. Designing from non-human perspectives was new and challenging, leading one group to note, "We mostly created ideas that match with the role of 'non-humans as materials'. This was the easiest!" This reflects criticisms that human-centered design (HCD) often prioritizes humans while treating non-humans as passive materials [23]. In this regard, the MtH perspectives posited in the cards were not as successful as we hoped in terms of switching the mindset of the students from HCD to MtH. To address this, enhancing the role-playing aspect of the activities by adding character creation sheets for and enactments as non-humans [25] could deepen engagement with non-human perspectives. Additionally, the focus on mushroom-related examples limited creativity, suggesting a need for more varied examples to inspire diverse thinking.

## 5   CONCLUSION & FUTURE WORK

In this paper, we introduced Shroom Cards, a novel tool designed to engage with MtH design through playful exploration and reflection. Our paper contributes an innovative approach to CHI PLAY and HCI communities by leveraging design cards and playful activities to guide designers and researchers in the MtH design space, an area typically less explored with playful methods. Initial feedback from students indicates that Shroom Cards effectively stimulate creative processes and foster diverse perspectives, although challenges persist in fully understanding non-human viewpoints and shifting from a human-centered to an MtH design mindset. Future iterations of Shroom Cards will incorporate enhanced role-playing elements (e.g., character sheets and fictional enactments as non-humans) and structured evaluation studies to assess not only the tool's impact on creative and reflective practices but also the play-related parameters (e.g., enjoyment, competence, immersion) of the proposed activities. Insights from the CHI PLAY community are

crucial for refining these aspects by sharing our tool, inviting usage, and discussing the cards and activities to improve them.

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