
This is an electronic reprint of the original article.
This reprint may differ from the original in pagination and typographic detail.

Haapaniemi, Heini; Leinonen, Teemu

Towards a Pedagogical Model Applying Commedia dell'Arte and Art Workshops in Higher Education Design Studies

Published in:
Open Education Studies

DOI:
[10.1515/edu-2022-0199](https://doi.org/10.1515/edu-2022-0199)

Published: 07/09/2023

Document Version
Publisher's PDF, also known as Version of record

Published under the following license:
CC BY

Please cite the original version:
Haapaniemi, H., & Leinonen, T. (2023). Towards a Pedagogical Model Applying Commedia dell'Arte and Art Workshops in Higher Education Design Studies. *Open Education Studies*, 5(1), Article 20220199. <https://doi.org/10.1515/edu-2022-0199>

This material is protected by copyright and other intellectual property rights, and duplication or sale of all or part of any of the repository collections is not permitted, except that material may be duplicated by you for your research use or educational purposes in electronic or print form. You must obtain permission for any other use. Electronic or print copies may not be offered, whether for sale or otherwise to anyone who is not an authorised user.

Research Article

Heini Haapaniemi*, Teemu Leinonen

Towards a Pedagogical Model Applying Commedia dell'Arte and Art Workshops in Higher Education Design Studies

<https://doi.org/10.1515/edu-2022-0199>

received October 28, 2022; accepted July 28, 2023

Abstract: This study introduces a pedagogical model: “the parallel co-inquiry cycles with performative inquiry for character related design” for higher education design studies that focus on characterization. The disciplines benefiting from cross-fertilization provided by the model include game design, fashion design, graphic design, theatre, and actor’s art. Besides the model, the article discusses curriculum integration of a shared thematic denominator Commedia dell’Arte in higher education design studies. The model synthesizes progressive inquiry, drama pedagogical methodologies, and theories on theater with hands-on art workshops to create tangible and digital knowledge vessels for characterization. The research design relies on parallel co-inquiry cycles, participatory ethnography with elements from participatory design tradition. The model identifies three major components within the single 3E-inquiry cycles, namely exercise, experiment and experience. The entire process acquires complexity as each single inquiry cycle enters the next loop of Observe–Plan–Act–Reflect and more time and resources are allocated to the process. The pattern of action and reflection has an iterative cycle format in this model. Reflection has two distinguished purposes: first, to internalize reflective design and to become a reflective practitioner. Second, to see the importance of reflection as distancing oneself from the current process, to allow a reflective mind to linger on the process and learn from mistakes to turn them into assets. Reflection as a metacognitive skill has an all-encompassing purpose in both design and learning processes. The model distinguishes two types of knowledge vessels. Knowledge

objects are abstractions that condense knowledge in the co-design process, whereas knowledge artifacts are concrete items, such as masks, outfits, and accessories in both digital and tangible formats. The model connects maker-culture, practice-based inquiry, and performative inquiry in the inquiry cycles. The drama method with performative inquiry acknowledges shared knowledge building in a collaborative, dialogical inquiry that fosters both argumentative and reflection skills.

Keywords: Commedia dell’Arte, curriculum development, design studies, pedagogical model, performative inquiry, progressive inquiry

1 Introduction – Setting the Scene

Characterization is an essential skill in all the following areas: digital game design, digital and tangible costume design, theater, and actors’ art. These skills are often learned in their own domain without seeing the potential for connections between them. Learning character design in a multidisciplinary way, so that the focus is on characters themselves without the limitations of each other’s specific domain, which is beneficial. Pedagogical models for the cross-fertilization of the disciplines that rely on characterization are missing. Character design, however, is a centuries old art form in theater. When moving to design processes that strongly rely on digital technology, we can easily forget the existence of the old traditions. This study stems from the need of a pedagogical model for higher education design studies in a university of applied sciences (UAS) context. The focus is on collaborative inquiry on characters for a multiplayer digital game wall in a 3D space.

Farce comedy characters and the entire art form are based on Commedia dell’Arte and its aesthetic presentations. Commedia dell’Arte was an improvised popular street comedy, which originated in Italy in the sixteenth to eighteenth centuries. The unscripted art form was based

* **Corresponding author: Heini Haapaniemi**, Creative Industries Research Unit, South-Eastern Finland University of Applied Sciences – Xamk, Kouvola, Finland; School of Arts, Design and Architecture, Aalto University, Helsinki, Finland, e-mail: heini.haapaniemi@gmail.com, heini.haapaniemi@aalto.fi, heini.haapaniemi@xamk.fi

Teemu Leinonen: School of Arts, Design and Architecture, Aalto University, Helsinki, Finland

on exaggerated stock characters and scenarios. The comic dialogue and action were adapted to a few basic plots, the scenarios (commonly love intrigues), and to locally relevant, topical issues. Actors were masked, and the art form was particularly body conscious (Rudlin, 1994).

New pedagogical models are needed for teaching and learning character-related design processes that build on the knowledge of classical theater art. The drama method itself acknowledges a shared knowledge factoring in a collaborative, dialogical inquiry that fosters both argumentative and reflection skills. Drama-based pedagogy has gained ground both in phenomena-based learning in the comprehensive schools and communication and language learning in secondary education (Bowell & Heap, 2013; Dunn, 2016; Schneider, Crumpler, & Rogers, 2006). Although the use of drama pedagogy has been studied in relation to higher education design studies (Brandt & Grunnet, 2000; Jacucci, 2006; Jonas, 2001; Liao & Person, 2012), experiments and studies examining the integration of process drama and design knowledge objects in context of character design are missing. The potential for the applicability of a new pedagogical design model is very timely as immersive multiplayer walls and spaces that rely on both characterization and embodied experiences are becoming very popular.

The result was a new pedagogical model “*the parallel co-inquiry cycles with performative inquiry for character related design*”. This study models a pedagogical co-design process and UAS curriculum integration synthesizing progressive inquiry, drama pedagogical methodologies, and theories on theater by incorporating hands-on art workshops to create knowledge artifacts for characterization in both tangible and digital formats. The significance of this study is to show the benefit and impact of interdisciplinary collaboration on characterization and a thematic denominator Commedia dell’Arte through the UAS design curriculum.

Knowledge objects are defined as artifacts or abstractions that condense knowledge (Bereiter & Scardamalia, 2003; Merrill, 2000; Niedderer, 2013). We align with constructivist epistemology on how knowledge is produced via methods that build on collaboration, multiple modalities, reflection, and negotiation on the meaning. Knowledge objects are connected to maker-culture and practice-based inquiry for characterization in game design, fashion design, and graphic design. Commedia dell’Arte equips the character outfits, digital and tangible costumes, and masks with associations, meanings, and cultural codes. Other knowledge objects referred to in this study include more abstract items such as collaborative thematic mappings of character traits, character line-art studies and references, modular in-game characters, mini games multimedia contents, and reflective written documents of the

collaborative design process in technology-based platforms and repositories.

This study relies on visual grammar and the meanings created through Commedia dell’Arte genre specific association. Thus, the genre and its features are analyzed also from the perspective of its contribution to the characterization of a farce comedy at theater and digital games. The role of both the collaborative design processes and the made artifacts themselves in the collaborative knowledge construction are central to the emerging new model. A new approach commensurate with the aims of design inquiry is facilitated via drama pedagogical and character-centered means. Even though the potential of drama has been recognized in enabling designers to be oriented toward the end-users and support the development of empathy, it has not been widely and systematically applied to higher education design studies outside of theater departments. The dramatic process enables designers and versatile stakeholder groups to co-construct meaning together, study possible scenarios, and empathize with user groups.

For this study, co-design was facilitated in shared study modules with UAS and university students of game design, game programming, graphic design, service design, fashion design, and industrial design. End-users were represented by eighth graders from a comprehensive school specializing in drama and hi-tech.

In the following sections, we construct our theoretical framework and introduce the series of workshops as the parallel inquiry processes that produced student-generated data for the analysis. Following that, we analyze and categorize the data from the perspective of Commedia dell’Arte element. We discuss the relevance of comedy characters and carnival as examples of a reverted order and triumph of the powerless over the powerful. To conclude, we demonstrate why drama pedagogy and theories from theater are relevant to higher education design studies, especially with character design processes.

2 Theoretical Framework

2.1 Progressive Inquiry with Artifacts and Knowledge Work

Design inquiry is often considered to be experiential and iterative in nature and benefits from relative creative freedom. Nevertheless, design inquiry needs to be constrained and predisposed with the selected genre, form, purpose, modality, and material dictated by the end

product (Ledin & Machin, 2020). In this study, we focus on a digital multiplayer game in a 3D space. Progressive inquiry is a pedagogical model for structuring and supporting a group of learners in a deepening question-explanation process. Progressive inquiry consists of several parallel and simultaneous inquiry processes within which consecutive iteration cycles and collaborative knowledge construction take place (Hakkarainen, 2000).

In this study, we conceptualize and differentiate two inquiry vessels, knowledge objects and design artifacts (Bereiter & Scardamalia, 2003; Hakkarainen, Palonen, Paavola, & Lehtinen, 2004; Hakkarainen, 2009; Merrill, 2000; Niedderer, 2013) created by the students during their study project. Knowledge objects include a variety of digital contents and abstractions: the game design document, the design drivers, concept maps, character personality trait lists, early prototypes, student reports, visual learning diaries, and sketches done individually and produced as a group assignment. Design artifacts in this study refer to both digital and tangible masks and costumes with integrated Commedia elements. We acknowledge the role of creative exploration and workshop-based creative practice, which combines both theory and practice in the inquiry cycles for acquiring new interpretations and significance of the Commedia elements. Progressive inquiry on characterization centered around both tangible artifacts and intangible, abstract knowledge objects that were created in design workshops that studied the elements of Commedia dell’Arte, the thematic denominator.

Knowledge work can be conceptualized as work that focuses on advancing and articulating knowledge objects by the learning community’s collective efforts and resources (Bereiter, 2002; Bereiter & Scardamalia, 2003; Hakkarainen et al., 2004; Schatzki, Knorr-Cetina, & Von Savigny, 2001). In this study, multiple UAS study lines, university students, stakeholders, end-users, and theater professionals partook in knowledge construction and cognitive processes. Objects of knowledge are, according to Knorr-Cetina, “characteristically open, question generating and complex” (Cetina, 2016; Knorr-Cetina, 2001, p. 181).

Knowledge objects are abstractions that take shape when investigating the phenomena or task at hand in collaborative, iterative inquiry processes. Knowledge objects enable the process, as they evolve over time, are in progress, incomplete and in their nature open-ended (Cetina, 2016; Knorr-Cetina, 2001). Since knowledge objects are always in the process of being materially defined, they “continually acquire new properties and change the ones they have” (Knorr-Cetina, 2001, p. 181). Even though they are never fully and unambiguously complete, they can be used at any stage to analyze the current stage of the

progress of an inquiry (Merrill, 2000). Similarly, from a narrative point of view in negotiating shared meaning and value within co-design process, an epistemic object “embeds a story that enlists the support of others within the same inquiry, engages them in building upon the narrative or disputing it, and results in some form of collaborative understanding” (Khazraee & Gasson, 2015, p. 140).

To facilitate transfer of learning, it is essential to engage students in collaboratively solving complex and interlinked challenges. A thematic denominator in higher education design curriculum enables several parallel design inquiries to co-occur and benefit each other as the same interdisciplinary students are invited to participate in experimenting new modalities within the co-existing collaborative inquiry rounds. Parallel to the digital characterization process, the co-design process for the multiplayer digital game wall interface, the co-design for the game itself with integrated minigames and Commedia elements, as well as the design process of the tangible concrete wall took place. In these parallel co-design processes, students created, compared, and assessed various optional solutions to multifaceted challenges and became equipped to solve unanticipated, interdisciplinary problems both now and in the future (Marton & Trigwell, 2000; Tyler, 2021).

2.2 Computers as Theater – The Multiplayer Game Wall as an Example of an Interactive Interface

Brenda Laurel draws conceptual connections between theater, digital games, and digital interfaces in *Computers as Theater* (1993). In her seminal work, Laurel advocates an analogy between computers and theater with many shared concepts for comparison. She refers to Aristotelian (384–322 BC) principles when analyzing the similarities in computer interfaces, games on computers, and theatrical performances. Especially important is the emotional pleasure attached to well-designed affordances and the concept of agency in new media art with gamified content.

The techniques for orchestrating human response in theater and immersive digital interfaces are strikingly similar. First, there is a fundamental concordance in representing action with multiple agents, as both domains are action and character based. Second, theater provides a model of human–computer activity that according to Laurel is “familiar, comprehensible, and evocative” for wider public (Laurel, 1993, p. 30).

In this study, we recognize and use theoretical conceptualization for characterization from Aristotle’s *Poetics*,

which is the philosophical basis of analyzing performing arts. *Poiesis* refers to becoming of life, to start existing, the very essence of birth or becoming in an ongoing process – not the praxis or theory of it (Aristotle, 2006; Taminiaux, 1987). The computer, especially its latest development and usage in an immersive 3D space with an interface, allows gamers to participate in the becoming. The very essence of *poiesis* is an ongoing action of representation, which is established and strengthened by “the sensory immersion and the tight coupling of kinesthetic input and visual response,” very similar to audience engagement at the theatrical performance (Laurel, 1993, p. 21). Both domains, theater and computers, orchestrate and amplify experience. In this study, the end product for which students generated characters and game concepts was a digital interactive immersive multiplayer game wall, which has touch sensitive sensors.

A wooden multiplayer touch sensitive game wall was co-designed with the South-Eastern Finland UAS, Xamk multiple designing, engineering, and programming study lines together with stakeholder OiOi, a company specializing in experiment architecture. The game wall is located at the Xamk Kouvola campus in a 3D space Future Experiment Lab FUEL and has two additional side screens and a surround sound system to create an immersive environment. The game wall experience is unique due to its multiplayer aspect. It is operated as a huge touch screen with physical presence required.

The multiplayer game “The Great Escape” referred to in this article derives inspiration from a play called *The Comedy About a Bank Robbery*, a farce comedy which as a genre originates from Italian street theatre Commedia dell’Arte which relies heavily on set scenarios and stock characters with masks as further elaborated in this article. Besides Xamk and a Russian university of technology and design, collaborators of the multiplayer game included Kouvola City Theatre, OiOi, Art Testers, Taike Regional Game Artist Jaakko Kempainen, Kouvola youthwork and urban art sectors, as well as end-user representatives from Kouvola Eskonlanmäki comprehensive school students specializing in technology and drama.

In the pedagogical model, we have taken into consideration that the interface design, technical capacity, and performance of the multiplayer game wall were designed during the same set time frame of the project as the game itself. Both were part of the parallel co-design inquiries, set contents to the learning objectives, and finally contributed to the research setup, data collection and research results in the form of the pedagogical model.

In digital games, experience is machinated and validated via affordances, such as character-based affordances.

If the game has characters, as this study has, the protagonists and antagonists with their characteristic traits are designed according to the peculiar genre they represent, for instance, action, comedy, tragedy, or melodrama. In multiplayer games and digital experience environments, the action is based on a vast amount of shared information or common ground. In multiplayer games and digital experience environments, the action is based on a vast amount of shared information or common ground. Collective actions build on that accumulation, the perceptual common ground, which directs, and orchestrates interaction through the appearance and behavior of objects on the screen (Laurel, 1993). The dramatic interactions – collaboration, constraints, and engagement – all become shared information, the common ground. The multiplayer wall provides the shared context for action in which the players are agents, and the digital characters with their specific traits contribute to affordances.

2.3 Commedia dell’Arte, Aristotle, Carnival of Comedy, and the Paradox of a Wise Fool

Commedia dell’Arte, a popular street theater from the sixteenth–eighteenth centuries, designates how the audience engages with the characters and the fast-paced action specific to the genre. Commedia dell’Arte can be described as an unscripted improvised comedy with stock characters and set scenarios (Chaffee & Crick, 2015). The three words of the genre name translate to “comedy of the artists” distinguishing its performers as artists not as amateurs. *Arte* can be translated into English not only as *artists* and *art* but also as *craft* and *know-how* (Rudlin, 1994, p. 14). It is a genuine actor’s art, and therefore, we decided to integrate actors’ movement as workshop content for inquiry purposes.

Commedia dell’Arte stock characters’ nature and temperament were exaggerated, and they reflected the different classes of society. Within set scenarios, the characters’ entrances and exits were fixed, yet the content of acting was unscripted improvisation, a carnival of comedy with the *lazzo* – special witty or foolish jokes. The stock characters and fixed social types included such as foolish old men, devious servants, and military officers full of false bravery (Rudlin, 1994, pp. 62–63).

In *Poetics*, Aristotle provides a dramatic theory with elements of qualitative structure that are beneficial in building and analyzing digital computer-based fictional worlds of today that are built on representations (Laurel, 1993, p. 36). Even though Aristotle’s dramatic theories stem from the Classical period in Ancient Greece, they are

valuable in identifying and elucidating formal and structural characteristics of both narratives and actions of contemporary digital games. Aristotle analyzed how the Greeks employed drama and theater as tools for thought, in much the same way as we do today or in the way that we envision employing them in the not-too-distant future in digital fictive worlds, digital games, and immersive environments (Laurel, 1993, p. 40).

Aristotle differentiates between Greek tragedy and comedy throughout *Poetics* by distinguishing between the nature of the human characters. While comedy focuses on depicting less virtuous people with their weaknesses and foibles, tragedy deals with serious, important, and virtuous people (Aristotle, 2006). By focusing on comedy – particularly in *Commedia dell’Arte* and *farce comedy* – we need to ask what does foolery and what do fools teach ordinary people and why should everyone embrace their inner fool. Foolishness entails many subcategories with aspects of trickery, entertainment, wittiness, verbal and physical acrobatics, folly, stupidity, idiocy, anarchy, sarcasm, and cynicism, to name some aspects. There is a social demand for accepted forms of foolery and thus a need for these exaggerated qualities in art and fiction. The fictive foolish characters are usually treated by the audiences with mockery, ridicule, and derision – but also saluted and welcomed with liberating laughter (Telfer, 1995).

Pearson (1991) divides the journey of the Fool archetype into four stages of which we learn different perspectives such as playfulness, naivety, comedy, and comical elements. The first and most elementary phase of a fool’s life cycle is similar to an innocent child for whom life resembles an enjoyable game to be played for the fun of it with not much responsibility or need to contribute to the society. In the next phases, Jester and Trickster live life fully in the moment. They teach the audiences to celebrate life and its offerings with a “carpe diem” mentality. The Trickster is able to use the acquired cleverness “to trick others, to get out of trouble, to find ways around obstacles and last but not least to tell the truth without impunity” (Pearson, 1991, p. 60). Therefore, according to Pearson, there is a deep philosophical meaning in the Trickster, who can help us see “unconventional approaches to problems or entertain an entirely different world view” (ibid.). Thinking outside the box metaphor is very similar to designers’ and artists’ position, role, and significance in society. The Trickster’s capabilities and qualities can become a genuine transformative power “in times of massive societal change, when the capacity to change course in midstream is vital and immensely socially useful” (Pearson, 1991, pp. 62–63).

Jester and Trickster characters have been granted the privilege and freedom to say aloud, often abruptly, things that are unconventional and yet might have a serious

message about the current state of affairs. This type of inadvertent verbal acrobatics containing puns full of meaning is common to characters in *Commedia dell’Arte* art form as well. In archetypes described by Pearson, both the Fool and the Sage search for balance and are complementary to each other at the end of their life cycle, when the transformation through four Fool stages is successful and a refined Wise Fool appears.

2.4 Drama as a Collaborative Inquiry

Drama with its emphasis on action provides strong social contexts for learning and supporting a motivated students’ desire to communicate (Dunn, 2016; Jackson, 1993; O’Neill, 1995; O’Toole, 1992; Winston & Stinson, 2016). The method has a special feature of simultaneous observation and action, research, and exploration of the fictive world to create understanding, negotiate meaning, as well as experience empathy toward the fictive characters (Jackson, 1993; O’Toole, 1992; Owens & Barber, 2001). In this study, drama pedagogical methods were used in characterization and creating the digital game storyline with aspects of community, empathy, and identity (Hand & Moore, 2006; Tanenbaum & Tanenbaum, 2015).

Transition from expression to experience through drama was used to evoke collective creativity in the *Commedia dell’Arte* related contents’ creation. The students’ teams were guided by applying process drama methods to enhance critical thinking and reflection for action, in action and of action (Bowell & Heap, 2013; Schneider et al., 2006; Schön, 2017). The link between intellectual understanding and the body, embodied learning in communicating with and through the body was employed in art workshops and process drama workshops, and was crucial for three causes such as the characterization, the *Commedia* mask element, and the multiplayer game wall end product (Brauer & Bräuer, 2002; Dunn, 2016; Khaner & Linds, 2015; Richards & Rodgers, 2001; Vettraino & Linds, 2015).

Process drama presupposes a shared fictive world and a mutual agreement between all participants including the facilitator, who also acts from within a role within a given scenario and occasionally invites participants to reflect and analyze the ongoing action by stepping in and out of the fiction (O’Neill, 1995; O’Toole, 1992; Owens & Barber 2001; Schneider et al., 2006). Process drama is an improvisational, unscripted form of drama in which participants are guided to imagine, enact, and reflect upon human experiences. Process drama includes the notion of “performative inquiry” (Fels, 2015) with a critical element of reflection. Reflection in action, reflection for action, and reflection on action all are integral parts of the process

(Schön, 2017). The process entails an extensive research and preparation phase prior to the dramatic action phase, which can contain reflection moments and is always followed by facilitated reflection phase that can consist of both written and verbal reflection (O'Neill, 1995; O'Toole, 1992; Owens & Barber, 2001; Taylor & Warner, 2006). The active acting part (the drama) is not intended for audiences but is nonexhibitional. It has many similarities with Commedia dell'Arte, which is also unscripted improvisation within set scenarios with stock characters that have specific predetermined qualities and traits.

Process drama was used in three workshops to map the connections, relationships, and tensions between the chosen game characters. The drama pedagogical learning process brings forth empathy toward the fictive personae, at best enlightenment and revelations about interconnected social relations, questions related to the scenario and issues or phenomena under study. The method is about agreeing to participate in a longitudinal process of thinking, planning, improvising, and engaging oneself in a dialogue according to the given role (O'Neill, 1995; O'Toole, 1992; Taylor & Warner, 2006; Winston & Stinson, 2016).

The values promoted through drama pedagogy include openness, empathy, engagement, and student-centeredness. Competences enhanced were creativity, reflection, metacognitive, analytical, and communication skills as well as team skills. The pedagogical philosophy relies on a constructivist approach and collaborative inquiry. The method requires the active role of a facilitator as a coequal and performing team member, capable of facilitating analyzes of power structures within the created scenarios and between the characters.

3 Research Design

3.1 Ethnographic Approach

The present study relies on participatory ethnography with elements from participatory design traditions (Blomberg & Burrell, 2009; Blomberg & Karasti, 2012). In this study, one of the researchers has been involved in the design of the learning environments and activities with an attempt to experiment with new forms of curriculum integration of a student-led design process. Within the experimental design, there has been an attempt to develop a pedagogical model that could be used as a framework to design learning environments and activities.

In line with ethnographic research, one of the researchers has been doing fieldwork with the students and at the same

time collecting data including artifacts created by the students. Participatory design is present in several stages of the students' study project, and the process has been iteratively justified depending on the field observations and discussions with students and teachers involved in the process. Therefore, part of the analysis and the development of the pedagogical model has taken place already during the study project. In this article, however, we focus on the analysis carried out after the study project and rely on the field notes and artifacts created during the study project by the students.

3.2 Data and Analysis

For our data analysis, we gathered multifaceted student-generated forms of data, such as visual mappings for mini-games relying on distinct elements of Commedia, mapped interconnectedness of characters, digital and tangible masks, outfit sketches, and hackathon prototypes for the multiplayer digital game. Data were collected at hackathons, study modules, and workshops held at the South-Eastern Finland UAS – Xamk, during years 2019–2021. Data were collected and clustered in folders in online cloud service repositories (Teams) to which students, instructors, and one of the researchers had access. Permission to use the data for research purposes was granted by the Xamk managing authorities, namely, the vice rector (Figure 1).

An ongoing and timely comparison of different student-generated knowledge objects including both preliminary sketches and polished versions of design artifacts was possible through participating and observing study modules. Students stored their output, both individual and co-produced in interdisciplinary teams, into a shared cloud service repository, which was accessible to their peers and researchers. Each phase of the process was also documented with pictures. Large volumes of initial data were compared, and compatible features were organized into content categories.

The second phase was viewing and categorizing the already sorted data by assigning labels, attributes, and features referring to Commedia elements and possible affections the data might produce in reference to the basic moods and emotions associated with each Commedia dell'Arte stock character. Subsequently, subcategories under previously mentioned content categories were opened as the categorization procedure advanced.

The comparative data analysis continued through workshop and study module entities as the design process proceeded. Concerning tangible masks, the data were gathered while taking part in creative design-action through a three-



Figure 1: Knowledge objects including mappings, minigame proposals, and character trait lists; design artifacts including pictures of digital and tangible costumes and masks. Photo credit Heini Haapaniemi.

day workshop event including demonstrations of actors’ art. Besides collecting student-generated data, pictures were taken from hackathons and workshops to ensure the triangulation of data collection methods.

Throughout the study modules, the researchers mapped data connections and feature categories which were used to form initial coding categories. Triangulation of visual and verbal data gathering methods enabled thick description. Combining drama method with design and theater theory and integrating these two into design practice in an iterative multidisciplinary design process can benefit the production of a new pedagogical model and thus advance the entire field of higher education design studies.

4 Results

In the following sections, we present the two main results of the study. We start by describing and reflecting on curriculum integration with several educational activities and students with different backgrounds. The twofold results, including a practical part with reference to theory in the higher education design context, are explained briefly under each subsection. After this, we present the pedagogical model developed based on the findings of the curriculum integration and students study project by applying Commedia dell’Arte and art workshops.

4.1 Curriculum Integration

With students from various programs of the university, it was important to consider how the interdisciplinary study project can serve the different learning needs and objectives of each program. Therefore, we relied strongly on relatively open-ended workshops and hackathons where students could freely explore different topics related to the study projects. With guidance from the teachers, students were able to rely on and develop their skills and competencies gained in their earlier studies but were at the same time challenged with very different thinking and practices from other disciplines.

4.1.1 Service Design Workshops and Advergame Prototypes at and Interdisciplinary Hackathon

A mechanism often employed in UAS relies on adopting work-life practices, such as teamwork, commissioned customer assignments, project work, and multidisciplinary collaboration in pedagogical practices. In this study, students were commissioned to design an advergame as a side product of a theatrical play. The process started in 2019 by mapping the needs of the Kouvola City Theater in their audience engagement project for youngsters. In this framework, we wanted to explore whether gamification would be beneficial to further discuss the thematic content inspired by the farce comedy *The Comedy About a Bank Robbery* by Henry Lewis, Jonathan Sayer, and Henry Shields. The piece was adapted to the town of Kouvola, which has an industrial background and working-class community identity.

Kouvola theater invited 1,800 eighth graders from the region to see the play, learn about making theater productions, and participate in pedagogical workshops as part of the nationwide Art Testers project. The UAS decided to make a digital side product, a multiplayer, interactive game wall and game narrative with characters, and an advergame to the theatrical play. Therefore, Commedia dell’Arte was studied in detail and integrated into the curriculum throughout the UAS design studies in fashion, graphic, service and game design, as well as game programming. To make this design process end-user focused, eighth graders from a local comprehensive school specializing in technology and drama were invited to participate.

Design drivers for the multiplayer game and the immersive wall were created concurrently in a service design workshop series with stakeholders, including end users. The series consisted of three meetings, two of which involved preliminary assignments. During the workshops, the participants worked in four small groups most facilitated through Teams.

The groups were mixed for each workshop session to ensure participants with different approaches, ideas, skills, and competencies became acquainted with each other.

User insight was collected from the eighth graders through a pretask of creating *fictive personas* (12) of their age group representatives. The *fictive personas* enabled integrating valuable information on specific niche groups, attitudes to gaming, digital competencies and platforms used, and views on creativity and different genres of art, e.g., literature, movies, digital games, music, dance, fine art, and theater and served as co-designed knowledge objects and data for the research (Stickdorn, Hormess, Lawrence, & Schneider, 2018). The versatile expectations, social and cultural meanings of the product, were made visible through creating *future headlines* in the third workshop (ibid.).

Five *design drivers* synthesized the service design inquiry phase to guide the next phases of the design process. The *design drivers* were youth at the focus; accessibility; multiplayer feature was highly recommended for the community aspect; gamification elements should require versatile skills, such as bodily movement, reaction speed and intellectual skills, quick reasoning, collaboration, and relying on support from your peers; intuitiveness, playing the game is easy and self-imposed; testing prototype-versions was seen as crucial by the youngsters.

Integrating end-users at an early stage of the design process enables the collection of insight from them. Most were positively surprised how much expertise they had on virtual games, multiple player games, different art forms, and social media channels.

Collaborative construction of knowledge continued in an interdisciplinary hackathon between the UAS and a Russian university of technology and design. Experience architecture keynotes and actors' art demonstrations on Commedia movements with masks were followed by co-designing and step-by-step mentoring of the participating university and UAS students. Scaffolding the learning process was done in collaboration with OiOi specializing in game walls and experiment architecture; The Smirnov School of Art, Moscow; and regional game artist Jaakko Kempainen from the Arts Council of Finland alongside the UAS and university staff.

4.1.2 Process Drama for Characterization

Process drama as a pedagogical tool is an invitation to co-create a fictive world with scenarios. The drama inquiry process can be used to study any chosen phenomena or societal issue regardless of its origin or cultural historical

time it stems from (O'Neill, 1995). The imaginary scenario, which is mutually agreed and built by participants, is time and place specific and entails characters that have linkages with each other (O'Neill, 1995; Schneider et al., 2006). Characters initiate action and dialogue, all having their own motivations, value sets, and goals according to which they act and react to each other. These motivations have been discussed, justified, and constructed prior to acting the scenario out (Jonas, 2001; Schneider et al., 2006). The motivations and psychology of each character can be built with a larger group of collaborators, yet how these characters react to each other and socialize is a matter of inquiry in the acted-out scenario (Dunn, 2016; O'Neill, 1995; Owens & Barber, 2001).

The essence and constitution of the character are revealed when they act and make moral choices (Aristotle, 2006). Process drama was carried out in three multidisciplinary designer workshops to enable the participants to try out roles, explore motivations, and reflect in action. First, traits of the Commedia dell'Arte stock characters were mapped. Students formed teams and used this phase as an inquiry into the art form. Second, these character-based mappings were applied in the drama personae referring to *The Comedy About a Bank Robbery* and characters derived from it for the multiplayer wall. These comedy characters in their nature already are exaggerations of temperament archetypes, and their traits were studied and used in further mapping the game character traits, motivations, and their fictive life stories. Third, drama scenarios were created in which the students and the facilitators acted out to enhance the characterization process by exploring and building a consistency on their character's reactions and personality to find versatile context-specific explanations for behavior and action.

The last workshop consisted entirely of facilitated reflection in an oral format, and a written reflection was delivered by the groups as a course reflective learning diary. Students were further challenged with such questions as, what is the profound purpose of comedy and what can comedians, tricksters, and parodied fool archetypes such as the Wise Fool teach us about being humans.

Aristotle describes the principles of constructing a character with four main principles. The protagonist, the main character, should be good, appropriate, realistic, and consistent. A special request for consistency in inconsistency diminishes confusion in the audience. Avoidance of unexpected shifts in character behaviors applies to every aspect, values, morals, and reasons why the characters act and react the way they do. Temperament and basic mood are linked to the commedia masks and were thus examined. Temperament dictates whether the character is easily

irritated, optimistic, talkative, open minded, reserved, introvert, extrovert, elegant, arrogant, well mannered, and so forth. Aristotle further divides the character types into three categories according to their status: superior to the audience, inferior, and at the same level – all of which have an influence on how the audience reacts to them. Each characters’ social status was studied by constructing status maps through experimenting with the characters within the process drama workshops. When the characters are agents in a virtual game, the player takes a stance toward the status of the agent. In other words, the status is relevant for engagement and how the player is related to the character.

Acting within a scenario brought the motivations, temperament, and other researched qualities of the character alive within the shared fiction, in both action and dialogue. The creative exploration of the collectively constructed fictive world together makes the method suitable for an interdisciplinary group of designers.

Fictive characters were assigned with features related to their appearance and mental aspects: ambitions, values, guiding principles, mottos, and stories from their past to enliven the design process. The list of character attributes worked as an evolving knowledge object that was supplemented throughout the process by the participating interdisciplinary students.

4.1.3 Mask Workshops

In Commedia dell’Arte, masked characters are often referred to as “Masks” (*maschere*) (Chaffee & Crick, 2015). The “fixed type” and “stock character” are loaded with human reference and cultural meaning in the context of a stage but can never be mixed with a representation of a human being – they are not alive in that sense, but caricature types (Rudlin, 1994, pp. 34–35). Female characters, including servants, were most often not masked. The female character in the masters’ group was called *Prima Donna* and could be one of the lovers as in our study *Isabella*, the Bank Director’s daughter. At the time of the flourishing of the genre, the Holy Mother and the Church could not be mocked (Chaffee & Crick, 2015). Therefore, there were no mother figures in Commedia dell’Arte.

We held masks workshops that investigated Commedia dell’Arte as an art form by making plaster masks. Experimental hands-on inquiry was complemented with theoretical knowledge on Commedia characters and actors’ art demonstrations. The plaster molds were made on each participant’s face and thus perfectly fitted the bearer. The most relevant part of the inquiry was to realize how to show emotions on the mask as facial expressions are hidden behind the mask. Costume and accessory designers also understood the focal position of the body and body

consciousness with a mask not only to the actors themselves but also to the audience.

Two demonstrations on actors’ art with a mask (Figures 2–4) were given to workshop participants on the first and last day to enable them to learn how to move and act with their own designer artifacts. This pedagogical decision to include an inquiry on actors’ movement was crucial to highlight the body and its movement.

Figures 2–12 show the embodied element in learning through material, movement, actor’s art, and imitation of the characters created while molding and designing the mask. The iterative process is a holistic approach integrating embodied learning through actor’s art and material-based hand-on design in making the design artifacts. Learning takes place not only when designing, adjusting, molding, fitting, and readjusting but also when watching, performing, and reflecting. This approach is derived from the inquiry cycle format, which enables distancing oneself from the process for reflection purposes prior to the next design activity. The very first actors’ demonstration revealed to the students that if movement is not accented or there is a lack of bodily engagement, the connection to the observers and audience is impeded – or in the worst case lost. This was clearly indicated in the workshop pictures by both successful and not so successful audience engagement, which was dependent on posture and clarity in movement. Thus, embodied learning was integral to knowledge construction.

The mask features took shape within a process of molding, designing, polishing, decorating, and coloring (Figures 5 and 6). The students realized that additional material and elements to punctuate the shapes of the mask needed to be as light in weight as possible. Even heavy-looking rough structures such as a long trunk-like



Figure 2: Actors’ art with mask demonstrations. Photo credit Rosamaria Nevalainen.



Figure 3: Actors' art with mask demonstrations. Photo credit Esko Ahola.

nose peculiar to Commedia Zanni character, or materials imitating heavy materials, such as steel, needed to be constructed light and hollow, to be wearable.

Throughout the design process, the masks were tried and fitted on the designers' own face (Figures 7 and 8). When worn, the mask resembles artificial skin. The mask, whether half mask or covering the whole face, obstructs facial expressions. Within the performative inquiry, students took shifts in



Figure 4: Actors' art with mask demonstrations. Photo credit Esko Ahola.



Figure 5: Adding texture. Photo credit Heini Haapaniemi.

observing and acting to experience both sides of the mask – from both the bearers' and audiences' point of view (Figures 10 and 11). This phase was followed by further molding the masks and giving them shape, polishing, and texture according to the chosen character traits and lessons learned from movement (Figures 9 and 12). Encouraged by the combination of arts-based and movement-sensitive design inquiry, three fashion design students created versions of the characters as tangible costumes from the past and present with the Commedia aspect as the supporting thematic denominator (Cunningham, 2019).

4.1.4 Minigames within the Game to Orchestrate Action

Game design document is an evolving knowledge object constructed to guide the game design process. To design the game structure, the initial ideation phase was organized and facilitated in a learning café arrangement and open for all interested students from all design and game



Figure 6: Trunk-like nose denotes lying and untrustworthiness in Commedia dell'Arte. Photo credit Heini Haapaniemi.



Figure 7: Adjusting the artifact on the face. Photo credit Esko Ahola.



Figure 9: Polishing and giving texture. Photo credit Esko Ahola.

programming disciplines at the UAS. This produced both action- and character-centered minigames and game loops that could be integrated into the overall (ideal) game structure with several minigames.

The proposed minigames within the game integrated distinct complementary elements of *Commedia*: fast paced decision making, changing activities and affordances piling rapidly on each other, triggering analytical skills in lock picking with collected codes and clues, communicative

activities, verbal and visual clues and responses received from *Commedia* characters, disguise and masks used to fool the guards, and different types of rooms and hallways to collect valuable loot while escaping from the vault. Other proposed co-designed elements included a collaborative maze puzzle and a specific movement-sensitive rhythm game about slicing obstacles such as furniture. The minigames were suggested to contain timers and a quick pace if a person relies on peer gamers in the multiplayer game.



Figure 8: Adjusting the artifact on the face. Photo credit Esko Ahola.



Figure 10: Acting with the masks and embodied learning. Photo credit Esko Ahola.



Figure 11: Acting with the masks and embodied learning. Photo credit Esko Ahola.

Communicative elements relied heavily on the Commedia stock characters. The characters were suggested to give tips on the progress for each minigame, and each gamer was suggested to be assigned an own character with specific traits and affordances. Elements of dialogue created between characters according to their relationships emphasized the communicative aspects.

For each game entry, new versions would unfold through partial random selection to make the game enticing and



Figure 12: A finalized and decorated mask. Photo credit Esko Ahola.

maintain the surprise element. Unfortunately, due to limited time resources, not all the minigame propositions were realized in the alpha version. An included narrative element was a news item with striking headlines and wanted signs with a randomized character face of the three robbers. The news item explained that a robbery had occurred and announced a reward for tips that lead to the detention of the robber team.

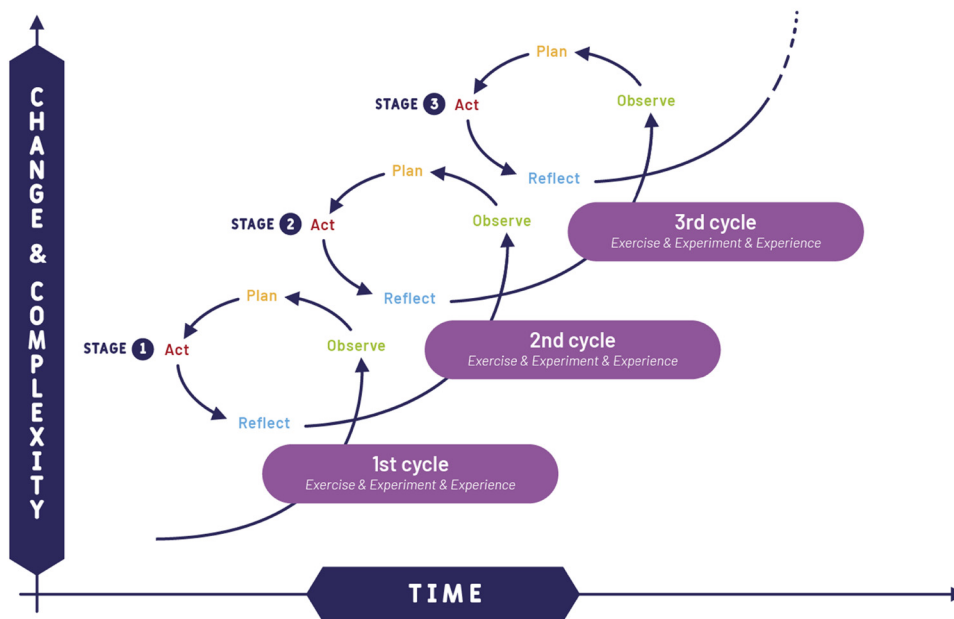
4.2 Pedagogical Model with Inquiry Cycles: Interdisciplinary Mask Drama and Game Design

The formed pedagogical model “*the parallel co-inquiry cycles with performative inquiry for character related design*” consisted of several interlinked inquiry processes within which iterations took place. All the inquiry types, the art-based, design-based, drama-based, and technology-augmented inquiry, processes together contributed to the collaborative knowledge construction similar to the definition of progressive inquiry “a pedagogical model for structuring and supporting a group of learners in a deepening question-explanation process” (Hakkarainen, 2000).

Recurring iterations are characteristic of design processes and therefore can be practiced also in design education. Each single co-inquiry cycle (Figure 13, below) has, according to Heron and Reason, a pattern of Observe–Plan–Act–Reflect (Heron & Reason, 2002, p. 167 as cited in Khaner & Linds, 2015, p. 134), which we decided to use as the bases of our model. Without first observing, defining the problem, and studying the context, the shift to planning is not possible. Planning entails thorough research on issues identified in the Observe phase and choosing the best methods to elicit more knowledge on the challenge or task at hand. Establishing criteria and considering constraints are part of the Planning phase which steers the Action phase. The Action phase is based on a selected approach aligned with the methodology, which then leads to reflection on the process and its outcomes. Reflection can contain a comparison of alternative solutions and lead to another loop or stage with more complexity based on the previous findings in the iteration cycles.

The new model identifies three major components within the single 3E-inquiry cycles, namely, Exercise, Experiment, and Experience. The entire process acquires complexity as each single inquiry cycle enters the next loop of Observe–Plan–Act–Reflect (stage 1, 2, 3, and so on), and more time and resources are allocated to the process. For each stage, more time is invested in the knowledge-building activities based on the previous findings, prototypes, or other outcomes. Testing is

SINGLE CO-INQUIRY CYCLE Exercise & Experiment & Experience



Modified from Heron & Reason, 2001 / by Heini Haapaniemi & Teemu Leinonen / visualization by Saara Kumpulainen

Figure 13: The single co-inquiry cycle consists of a recurring pattern of Observe–Plan–Act–Reflect, modified by Haapaniemi and Leinonen from Heron, & Reason (2002), visualization by Saara Kumpulainen and identifies three major components within the single 3E-inquiry cycles, namely Exercise, Experiment and Experience.

imbedded in the Action and Reflection phases, whether it is alternative qualities, traits, or behavior (inquiry 1); theoretical abstractions and mappings (inquiry 2); sketches, drafts, layouts, blueprints, patterns, and prototypes (inquiry 3); and interface design, alpha or beta version of the prototype, or test results with the end users (inquiry 4).

Exercise consists of repetition that can at times be tiresome and mundane. Exercise requires determination, concentration, discipline, and a growth-mindset that is not discouraged by difficulty, complexity, setbacks, incompetency, or failures which admittedly always occur at some point in the co-design learning process. Constant repetition builds up confidence in the newly acquired practical skills and gradually enables creative freedom as the method, material, platform, or equipment used becomes familiar to the young designers. This applies to *performative inquiry* as well. The method enables improvisation within certain limits, yet the courage to improvise is acquired only through small exercises, rehearsals, and repetition. Most important from the facilitator point of view is to establish a learning environment that encourages repeated exercise to refine competencies, which is essential to capacity building.

Experimenting is a mindset that requires courage to explore and navigate between alternative solutions, make propositions, build prototypes, visualize, and test the ideas.

It has an inbuilt element of play in it. Creativity and experimenting are integral parts of design processes. An important aspect of creativity is not being afraid to fail. Not all experimenting is successful in terms of usable solutions. The more complex the task, in terms of multidisciplinary challenges and wicket problems, the bolder experimenting within the inquiry loops is required.

Experience in this model refers first to embodied multisensory learning through design artifacts to construct knowledge, and second to multisensory end-user-oriented aspects of the end product, service, or solution. Drama pedagogy as a method is a multisensory experience. The character, the scenario, the relationships, and tensions between the characters are experienced in *performative inquiry*. Experience benefits the design process with a very special type of knowledge consisting of empathy, situational smartness, overall understanding of the context and the connections of one character with the rest. Besides *performative inquiry*, experience is provided particularly through the tangible masks: reflections on body consciousness when making and adjusting the masks, embodied learning through the presence and through senses in the actor’s art workshops, keeping in mind the final product (a touch sensitive interactive wall in a 3D space) that aims at providing meaningful, multisensory, shared experiences to the users.

PEDAGOGICAL MODEL Parallel co-inquiry cycles

DESIGN DIMENSIONS | Methods synthesized in inquiries:

Process drama, progressive inquiry, art workshops, actors' art workshops, technology augmented inquiries in online platforms

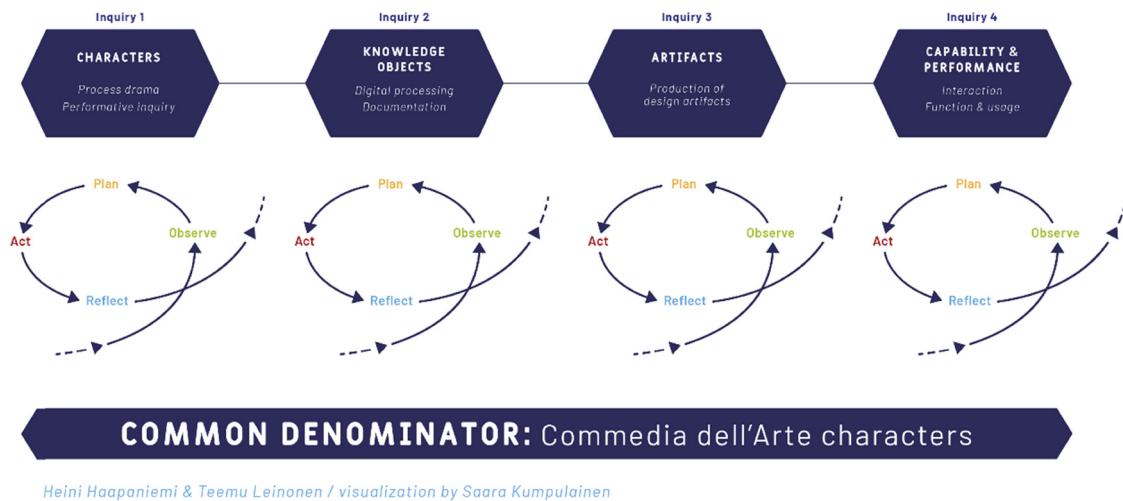


Figure 14: The Pedagogical model with parallel co-inquiry cycles consists of Characters, Knowledge Objects, Artifacts and Capability & Performance and refer to the central content objectives of each inquiry. Pedagogical model with parallel co-inquiry cycles by Heini Haapaniemi and Teemu Leinonen, visualization by Saara Kumpulainen.

The commensurate parallel co-inquiry cycles in this pedagogical model are called Characters, Knowledge Objects, Artifacts, and Capability & Performance (Figure 14). The names refer to the central content objectives of the inquiry. In this model, the four inquiries have a dynamic influence and impact on each other as they take place in a shared time and space – whether digital or tangible. Most importantly the same students, teachers, and experts form the learning community and can enroll and participate in each inquiry cycle freely if they wish. In other words, within the model, there is no traditional division for higher education study lines but equal access to students of design (such as game design, fashion design, graphic design, service design) and technology (such as programming) (Figure 15).

After each iteration round the Reflection phase enables a thorough analysis of the outcomes of each stage. Well-facilitated reflection entails elements of learning outcomes, learning process, learning tools, and methodology used. This study contained several co-inquiry cycles that were structured through interdisciplinary workshops and study modules listed previously. They formed a pattern of action and reflection in an iterative cycle format. Each cycle of Observe–Plan–Act–Reflect builds on previous inquiry cycles, leading to more complex and nuanced relationships between each phase of the cycle embedding reflection into it (Heron & Reason, 2001, p. 179 as cited in Khaner & Linds, 2015, p. 133). This four-phase inquiry cycle was used as

a base of the model with iterative stages and increasing complexity as Heron & Reason's inquiry cycle flows between action and reflection to "approach the interplay between making sense and action" and building praxis through experiential learning (2002, p. 167 as cited in Khaner & Linds, 2015, p. 134).

Reflection in this pedagogical model has two distinguished purposes: first, to internalize reflective design and to become a reflective practitioner (Schön, 2017) and second, to see the importance of reflection as distancing oneself from the current process, to allow a reflective mind to linger on the process, learn from mistakes, and turn them into assets. Reflection as a metacognitive skill has an all-encompassing purpose in both design and learning processes. In this model, higher education design students' competence building for reflection in action (when the design activities take place), on action (in hindsight), and for action (prior to the next loop in the iterative cycles) is scaffolded (Schön, 2017). Within each cycle, reflection is used to plan, monitor, and assess one's own and the teams' design process and performance as well as lead to the next level in the iteration. Thus, reflection has a fundamental pedagogical purpose, not only in celebrating the successes but learning from the failures. The most beneficial reflection is on aspects that did not work out well. For a reflective designer, failures become victorious through reflection as they provide insight into the process and the design task from multiple perspectives: concept, users, usability, aesthetics, function,

inquiry 1	inquiry 2	inquiry 3	inquiry 4
drama pedagogical tools	drama pedagogical tools	drama pedagogical tools	multiplayer game wall: interface
process drama	process drama	process drama	touch sensitiveness
performative inquiry	performative inquiry	performative inquiry	3D space dimensions
embodied learning	embodied learning	embodied learning: actor’s art with mask, performer, and audience	embodied learning: presence, multiplayer aspect
characterization: personality, status, relations and values through action	knowledge objects: verbal and visual digital mappings	design artifacts: hands-on creation	qualities, capacity & performance
characterization: traits, temperament, attributes and qualities listed	abstractions: ideas and notions of an abstract or theoretical nature	designerly practices with materials	OiOi Pinta interface & wooden wall structure
documentation	processing & documentation	documentation	documentation
Commedia dell’Arte a common denominator: both a constraint and the guiding principle	Commedia dell’Arte a common denominator: both a constraint and the guiding principle	Commedia dell’Arte a common denominator: both a constraint and the guiding principle	Commedia dell’Arte a common denominator: both a constraint and the guiding principle
	service design tools: personas, future headlines		service design tools: personas, future headlines
	design drivers		design drivers

Figure 15: Complementary methods in single co-inquiry cycles by Heini Haapaniemi and Teemu Leinonen.

and embedded qualities. In successful learning processes, adequate time and facilitation are allocated to learn reflection strategies, which will be beneficial later in the working life context in business-driven assignments with less time for reflection. Through reflection, the design process becomes a source of important information. The candidate – the future designer – can assess his or her own design contributions, even the mistakes made, in a constructive manner.

The formed pedagogical model “*the parallel co-inquiry cycles with performative inquiry for character-related design*” does neither recommend nor limit the number of consecutive loops or stages within the single inquiry cycles. From the learning perspective, the number of loops is determined not only by the task but also by the collective skills and competencies of the participating learners within the interdisciplinary team.

Constructing knowledge together requires transferable skills, which should not be underestimated. Central to success are the teams’ capability to communicate, distribute responsibility, define tasks according to the objectives, share knowledge, and refine ideas into the requested form. The inquiry processes are best enabled and scaffolded by well-selected tools, platforms, and facilitation, which all together form the learning environment.

Societal and communicative aspects of co-design refer to a group of persons engaged in making new meaning

together (Kennedy & Kennedy, 2010; Khaner & Linds, 2015). Discussion, asking and answering questions, peer teaching, and critiquing are used to better transfer understanding gained through the learning process to real-world problems (Park, 2007, pp. 192–193, as cited in Khaner & Linds, 2015). This emphasizes the relationally oriented nature of the learning process, requiring the “mutual constitution of participants in a dialogue” to generate conceptual knowledge objects referred to earlier (ibid.). These knowledge objects also build on Weiss’ (1999) statement that “being embodied [is] never a private affair” (Weiss, 1999, p. 5 as cited in Khaner & Linds, 2015, p. 147) as a fundamental component of the intercorporeal nature of inquiry. This formulation of meaning is essential to the process of collaborative inquiry in the context of immersive space-specific digital multiplayer games with emphasis on characters and in reference to theater.

Characterization was central in selecting the inquiry methods keeping in mind the end product, a digital game wall. According to Lynn Fels, “arts-based researcher and drama facilitator, *performative inquiry* offers students opportunities to voice their presence, to interrogate issues, to work collaboratively across disciplines in a creative environment that welcomes who they are and what they have to offer” (Fels, 2015, p. 151). *Performative inquiry* has a strong communication and collaborative effect as it is an action site of

research in which knowledge construction takes place or “emerges as participants create together” (Fels, 2015, p. 152). Fels emphasizes reflection “as an action site of inquiry, a shared engagement of reciprocal learning” (Fels, 2015, p. 154).

A key to impactful pedagogy and the success of the formed pedagogical model “*the parallel co-inquiry cycles with performative inquiry for character related design*” is in multisensory, multiplatform, embodied learning that acknowledges learners as active contributors in constructing knowledge together and uses technological platforms to enhance learning practices and iterative processes (Durrall Gazulla, Bauters, Hietala, Leinonen, & Kapros, 2020; Friedman, 2003; Muukkonen, Hakkarainen, & Lakkala, 1999). The focus was given to team processes and practices that can be traced in the data as well as students’ reflections regarding learning and collaboration experiences in the UAS study modules and hackathons.

Drama pedagogical methods, *performative inquiry*, and embodiment as a natural element of constructing knowledge means the students’ mind and bodies react to relational experiences and work as a reference on how they might receive them in the future (Khaner & Linds, 2015, p. 147). These generated learning experiences are of utmost importance in the ability of imagining someone else’s experiences, interpreting their responses, and feeling empathy – which all are at the core of drama pedagogical processes. The process of thinking, acting from within a role and the reflective practice the drama method entails and requires.

This study demonstrates how learning takes place when both the mind (cognition) and the body (senses) are present. In addition, storytelling with embedded imagination plays an important role. Drama methods use active and dramatic approaches to engage students in academic, affective, and aesthetic learning through dialogic meaning-making (Dawson & Lee, 2018). Drama-based pedagogy generates and cultivates many skills. Learning through drama enables cognitive development in the areas of problem-solving, critical thinking skills, decision-making, creativity and imagination, collaboration skills, reflection in action, communication, and analyzing personal contributions in collaboration. Therefore, *performative inquiry* is beneficial for character-related design throughout the higher education design study curriculum and beyond – applicable and recommendable to processes concerned with deeper end-user understanding.

5 Discussion

A trajectory of a character development process was facilitated through process drama to encourage the students to enter the designer phase of the process – drawing optional

digital versions of the outfits, starting the mask workshop process, and embarking on tangible outfit production for historical and circular-economy inspired performance costumes.

The character traits and qualities were co-designed in three process drama characterization workshops and further developed in a compact 10-day study module on illustration with experts from UAS and the Smirnov School of Arts, Moscow. Concept art tutorial sessions were combined with the game design group workshops, resulting in generating a coherent set of game character designs and optional mini-games. Students produced an impressive array of work including character profiles, illustrations, and a selection of initial game concepts.

Inquiry into the Commedia elements and character visualizations continued through game design study modules, which were open to all interested. Digital platforms used in the ideation phase included Discord, Miro, Teams, and Jamboard. Digital character design was enabled by Sketchbook Pro, Gimp, Krita, 3DBrush, Photoshop, and Invision Freehand, which were especially used for collaborative drawing, planning, and ideation amongst the UAS game design students. The platforms selected needed to be easily accessible for all invited to participate. Even though game developers were familiar with Discord, Teams was selected as a platform to deliver lectures, learning cafes, student workshops, and reflective feedback sessions.

The entire co-design process took 2 academic years and was planned based on the design drivers. For each module, interdisciplinarity was an asset. The game designers were competent to suggest minigames, define the game loops, and define the role of the player. The fashion and costume designers together with graphic designers should define the overall artistic and visual style and how the chosen characters would look related to their social roles and commedia counterparts. Further on, service design students brought ideas for accessibility and usability to the game design process, whereas the game programmers integrated technological advancement into the game to make it entertaining, fast paced, and user centric through its affordances.

The framework agreed included a color palette from the 80s combined with Commedia dell’Arte elements. These constraints enabled the production of individual character styles based on interpretations within the limits negotiated within each group. None of the Commedia elements were imposed, yet the student groups mutually agreed to integrate its elements into the game and follow the Commedia mask tradition. In designing the outfits, the character was placed within a narrative and the group negotiated what color, shape, pieces of clothing, accessories, and other detailing would best actualize the character qualities. The overall color palette was bright, as the Commedia

element is best inscribed using bright colors, instead of hues of gray or black and white.

Designs were a result of negotiated and shared considerations, and the groups voted between alternatives to ensure a democratic decision-making process. Therefore, the costume and outfit design followed a trajectory, starting with the exploration of the genre-specific costume designs from the past and moving toward an exploration of fashion design, eventually indicating ways in which digital games and digital fashion design can become mutually beneficial.

Integrating the theme throughout the design study curricula enabled the exploration of different dimensions of design with interdisciplinary teams. It also invited students to participate in creative knowledge practices in both hands-on design workshops and digital platforms, facilitating cross-fertilization of the findings. In summary, the described participatory learning environment cultivated students’ capabilities to work in interdisciplinary teams, to deal with complex problems, and foster their skills and competencies in a democratic design process.

6 Conclusion

This study illustrated the relationship between the students’ social interaction, performative inquiry, shared construction of both knowledge objects, and design artifacts facilitate reflection and learning. It provides support for understanding how parallel inquiry processes for different study lines with different methods can facilitate collaborative learning within UAS design studies. Further research would be to assess the applicability of this model to other thematic content than Commedia dell’Arte as a unifying curricula element in higher education design studies.

Design artifacts and knowledge objects were created in shared art-based and hands-on workshop inquiry processes, yet the processes were augmented with digital platforms and digital dimensions of design. According to Hakkarainen, “knowledge practices are the personal and social practices related to working with knowledge” (Hakkarainen, 2010). More generally, social practices are assemblages of human activity that involve goal-directed sequences of actions using particular method or technology and rely on a sociohistorically developed system of knowledge (Hakkarainen, 2009; Schatzki et al., 2001; Scribner & Cole, 1981). In relation to higher education practices, institutional settings and curricula provide the frame for practices applied in learning. The knowledge practices are increasingly technology augmented since technology has become such a fundamental mediator of work with knowledge.

Adding drama pedagogical inquiry was beneficial. It entails both scenario creation – characterization, acting, and movement – and a natural interlinkedness with artifact creation, such as performance masks or costumes. We discussed what roles could be assigned in knowledge construction to the co-designed artifacts and objects, both digital and tangible. Reflective elements in process drama enabled learners to address the knowledge components and structures for purposes of classification, generalization, and elaboration for characterization. Different design and art approaches worked as frames for constructing knowledge objects and design artifacts.

The parallel inquiries helped in systematic analysis, molding, visualizing, and designing of the wanted Commedia dell’Arte characters and their traits for the digital game. Students compared their research findings, discussed their aesthetic choices, and finally designed seven fictive characters that contain notable elements of the original Commedia characters. Drama methods are applicable in design processes that have characters and the action involved. They are also applicable in other design processes studying end-user groups, their behaviors, values, mindsets in experiences in purchasing and using a certain service or device.

Future experience labs that integrate immersive environments and digital multiplayer games are becoming a new norm of open learning environments created for shared learning. The end product, the digital multiplayer game wall, is physically located in one of these labs.

This new pedagogical model “*the parallel co-inquiry cycles with performative inquiry for character related design*” is applicable to the advancement of curricula development in higher education design studies. It aims to be academically rigorous and contribute to design university praxis: first, defining a theoretical framework for collaborative inquiry with one thematic unifying element; second, naming the components used in this study to synthesize a new model; third, designating relevant methodology for character-related inquiry concerning interdisciplinary creative practice of knowledge construction and artifacts design in higher education design studies.

Funding information: There has been no funding concerning this article.

Author contributions: Corresponding author Heini Haapaniemi Conceived and designed the analysis; Collected the data; Contributed data or analysis tools; Performed the analysis, Wrote the paper. Second author Dr Teemu Leinonen Conceived and designed the analysis; Contributed data or analysis tools.

Conflict of interest: The authors state no conflict of interest. There is no Conflict of Interest between Xamk and Aalto or any other parties.

Data availability statement: The datasets generated during and/or analyzed during the current study are available from the corresponding author on reasonable request.

References

- Aristotle. (2006). *Poetics*. ReadHowYouWant. Com.
- Bereiter, C. (2002). Education in a knowledge society. *Liberal education in a knowledge society* (pp. 11–34). Chicago: Open Court.
- Bereiter, C., & Scardamalia, M. (2003). Learning to work creatively with knowledge. *Powerful learning environments: Unravelling basic components and dimensions* (pp. 55–68). The Netherlands: Pergamon.
- Blomberg, J., & Karasti, H. (2012). Ethnography: Positioning ethnography within participatory design. In *Routledge international handbook of participatory design* (pp. 86–116). New York, NY, USA: Routledge. doi: 10.4324/9780203108543-6.
- Blomberg, J., & Burrell, M. (2009). An ethnographic approach to design. In *Human-computer interaction* (pp. 87–110). London: CRC Press. doi: 10.1201/9781420088892-11.
- Bowell, P., & Heap, B. S. (2013). *Planning process drama: Enriching teaching and learning* (2nd ed.). Routledge. doi: 10.4324/9780203125335.
- Brandt, E., & Grunnet, C. (2000, November). Evoking the future: Drama and props in user centered design. In *Proceedings of Participatory Design Conference (PDC 2000)* (pp. 11–20). New York: ACM Press.
- Brauer, G., & Bräuer, G. (Eds.). (2002). *Body and language: Intercultural learning through drama* (Vol. 3). Westport, Connecticut: Greenwood Publishing Group.
- Cetina, K. K. (2016). Objectual practice. In *Knowledge as social order* (pp. 97–112). London: Routledge.
- Chaffee, J., & Crick, O. (Eds.). (2015). *The Routledge Companion to commedia dell'arte*. Abingdon, Oxfordshire, UK: Routledge.
- Cunningham, R. (2019). *The magic garment: Principles of costume design*. Long Grove, Illinois: Waveland Press.
- Dawson, K., & Lee, B. K. (2018). *Drama-based pedagogy: Activating learning across the curriculum*. Bristol, UK: Intellect Books.
- Dunn, J. (2016). Demystifying process drama: Exploring the why, what, and how. *Nj*, 40(2), 127–140. doi: 10.1080/14452294.2016.1276738.
- Durall Gazulla, E., Bauters, M., Hietala, I., Leinonen, T., & Kapros, E. (2020). Co-creation and co-design in technology-enhanced learning: Innovating science learning outside the classroom. *IxD&A*, 42, 202–226. http://www.mifav.uniroma2.it/inevent/events/idea2010/doc/42_10.pdf.
- Fels, L. (2015). Performative inquiry: Reflection as a scholarly pedagogical act. In *Playing in a house of mirrors* (pp. 151–174). Rotterdam, The Netherlands: Brill.
- Friedman, K. (2003). Theory construction in design research: criteria: Approaches, and methods. *Design studies*, 24(6), 507–522. doi: 10.1016/S0142-694X(03)00039-5.
- Hand, M., & Moore, K. (2006). 10 Community, identity and digital games. *Understanding digital games*, 166. doi: 10.4135/9781446211397.n10.
- Hakkarainen, K. P. J. (2000). *Epistemology of scientific inquiry and computer-supported collaborative learning* (pp. 3604–3604). Toronto: University of Toronto.
- Hakkarainen, K. (2009). A knowledge-practice perspective on technology-mediated learning. *International Journal of Computer-Supported Collaborative Learning*, 4(2), 213–231.
- Hakkarainen, K., Palonen, T., Paavola, S., & Lehtinen, E. (2004). *Communities of networked expertise: Professional and educational perspectives*. Amsterdam: Elsevier Scientific Publ. Co.
- Hakkarainen, P. S., Viilo M., & Hakkarainen K. (2010). Learning by collaborative designing: Technology-enhanced knowledge practices. *International Journal of Technology and Design Education*, 20, 109–136.
- Jackson, T. (1993). *Learning through theatre – New perspectives on theatre in education* (2nd ed.). London: Routledge.
- Jacucci, C. (2006). Guiding design with approaches to masked performance. *Interacting with Computers*, 18(5), 1032–1054. doi: 10.1016/j.intcom.2006.05.005.
- Jonas, W. (2001). A scenario for design. *Design issues*, 17(2), 64–80. doi: 10.1162/07479360152383796.
- Kennedy, N. S., & Kennedy, D. (2010). Between chaos and entropy: Community of inquiry from a systems perspective. *Complicity: An International Journal of Complexity and Education*, 7(2), 1–15.
- Khaner, T., & Linds, W. (2015). Playing in entangled spaces - Exploring ethical know-how through embodied inquiry. In *Playing in a house of mirrors* (pp. 127–150). Rotterdam: SensePublishers.
- Khazraee, E., & Gasson, S. (2015). Epistemic objects and embeddedness: Knowledge construction and narratives in research networks of practice. *The Information Society*, 31(2), 139–159.
- Knorr-Cetina, K. (2001). Objectual practices. In T. Schatzki, K. Knorr-Cetina, & E. von Savigny (Eds.), *The practice turn in contemporary theory* (pp. 175–188). London, UK: Routledge.
- Laurel, B. (1993). *Computers as theatre*. New York: Addison-Wesley Publishing Company.
- Ledin, P., & Machin, D. (2020). *Introduction to multimodal analysis*. Bloomsbury: Bloomsbury Publishing.
- Liao, T. Y., & Person, O. (2012). Drama in design: An open brief to design for wellbeing. In *DS 74: Proceedings of the 14th International Conference on Engineering & Product Design Education (E&PDE12) Design Education for Future Wellbeing, Antwerp, Belgium, 06-07.9. 2012*.
- Marton, F., & Trigwell, K. (2000). Variatio est mater studiorum. *Higher Education Research & Development*, 19(3), 381–395. doi: 10.1080/07294360020021455.
- Merrill, M. D. (2000). Knowledge objects and mental models. *Proceedings International Workshop on Advanced Learning Technologies. IWALT 2000. Advanced Learning Technology: Design and Development Issues, 2000* (pp. 244–246). doi: 10.1109/IWALT.2000.890621.
- Muukkonen, H., Hakkarainen, K., & Lakkala, M. (1999). Collaborative technology for facilitating progressive inquiry: Future learning environment tools. In C. M. Hoadley & J. Roschelle (Eds.), *Proceedings of the Computer Support for Collaborative Learning (CSCL) 1999 Conference*. Palo Alto, CA: International Society of the Learning Sciences.
- Niedderer, K. (2013). Explorative materiality and knowledge. The role of creative exploration and artefacts in design research. *FormAkademisk*, 6(2), 1–20. doi: 10.7577/formakademisk.651.
- O’Neill, C. (1995). *Drama worlds – A framework for process drama*. Portsmouth: Heinemann.
- O’Toole, J. (1992). *The process of drama: Negotiating art and meaning*. London: Routledge.
- Owens, A., & Barber, K. (2001). *Mapping drama*. Carel Press.

- Pearson, C. S. (1991). *Awakening the heroes within: Twelve archetypes to help us find ourselves and transform our world*. San Francisco: Harper Collins.
- Richards, J. C., & Rodgers, T. (2001). *Approaches and methods in language teaching* (2nd ed.) New York: Cambridge University Press.
- Rudlin, J. (1994). *Commedia dell'arte – An actor's handbook*. London, New York: Routledge.
- Schatzki, T. R., Knorr-Cetina, K., & Von Savigny, E. (Eds.). (2001). *The practice turn in contemporary theory* (Vol. 44). London: Routledge.
- Schneider, J. J., Crumpler, T. P., & Rogers, T. (2006). *Process drama and multiple literacies*. Portsmouth, NH: Heinemann.
- Schön, D. A. (2017). *The reflective practitioner: How professionals think in action*. Routledge.
- Scribner S. & Cole M. (1981). *The Psychology of Literacy*. Cambridge, MA and London, England: Harvard University Press. <https://doi.org/10.4159/harvard.9780674433014>.
- Stickdorn, M., Hormess, M. E., Lawrence, A., & Schneider, J. (2018). *This is service design doing: Applying service design thinking in the real world*. O'Reilly Media, Inc.
- Tanenbaum, T. J., & Tanenbaum, K. (2015). Empathy and Identity in Digital Games: Towards a New Theory of Transformative Play. In *FDG*. http://www.fdg2015.org/papers/fdg2015_paper_49.pdf.
- Taminiaux, J. (1987). Poiesis and praxis in fundamental ontology. *Research in Phenomenology*, 17(1), 137–169. doi: 10.1163/156916487X00076.
- Taylor, P., & Warner, C.D., (Eds.). (2006). *Structure and spontaneity: The process drama of Cecily O'Neill*. London: Trentham Books.
- Telfer, E. (1995). Hutcheson's Reflections upon laughter. *The Journal of Aesthetics and Art Criticism*, 53(4), 359–369. doi: 10.2307/430971.
- Tyler D. (2021). *How to build your first game design document*. <https://www.gamedesigning.org/learn/game-design-document/> [accessed on 24.9.2021].
- Vettrano, E., & Linds, W. (Eds.). (2015). *Playing in a house of mirrors: Applied theatre as reflective practice*. Springer. doi: 10.1007/978-94-6300-118-2_1.
- Winston, J. & Stinson, M. (Eds.). (2016). *Drama education and second language learning*. Routledge.