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Published in:
Proceedings of the ServDes2018 Conference

Published: 05/07/2018

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

Please cite the original version:
Hannula, O., & Harviainen, J. T. (2018). User perceptions of design games as settings for organizational learning : Case Topaasia. In A. Meroni, A. M. Ospina Medina, & B. Villari (Eds.), *Proceedings of the ServDes2018 Conference* (pp. 417-439). Article 034 (Linköping Electronic Conference Proceedings; No. 150). Linköping University Electronic Press. http://www.ep.liu.se/ecp/article.asp?article=034&issue=150&volume=

PROOF OF CONCEPT
ServDes.2018
POLITECNICO DI MILANO

POLITECNICO MILANO 1863
SCUOLA DEL DESIGN
DIPARTIMENTO DI DESIGN
POLI.DESIGN

ServDes2018 - Service Design Proof of Concept
Politecnico di Milano
18th-19th-20th, June 2018

User perceptions of design games as settings for organizational learning: Case *Topaasia*

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Abstract

Design games are a co-design tool used in diverse environments including service design, improving organizational processes and creating strategies. In this paper, we expand the role of design games to include organizational learning and outline a theoretical framework for analysing how design games provide a creative space which supports processes of *expansive learning* (Engeström, 2001) within organizations.
We illustrate the framework by presenting preliminary results about the use of *Topaasia*, a design game for supporting co-development of organizational practices. Based on the user perception of *Topaasia*, we argue that design games can support organizational learning even in the absence of a design project by providing a space for creative dialogue through which practices are transformed. Finally, we propose a research approach further study the effects of using design games as tools of organizational co-development.

KEYWORDS: design games, organizational learning, interventions, expansive learning, creativity, playfulness

Introduction

Design games are a method of collaborative design in which highly context-specific physical games are used to invite stakeholders to participate in design processes. Design games have been shown to be powerful tools for creating spaces for creative dialogue, as evidenced by their use in the creation of new services, the improvement of organizational processes, and the creation of new strategies (Harviainen, Vaajakallio, & Sproedt, 2016; Klapztein & Cipolla, 2016; van Amstel & Garde, 2016). In this paper, we expand the role of design games by describing how design games can be used as settings for organizational learning.
We discuss design games as a method for developing practices and organizational processes by providing a space for playful creativity. Multiple authors have described design games as playful spaces and activities in organizational contexts (Vaajakallio, 2012; Hannula &

Irrmann, 2016), and the link between playfulness and creativity acknowledged in also organizational research (Mainemelis & Ronson, 2006). However, the patterns and processes connecting the use of design games to learning have remained largely unexamined.
In this paper, we propose that the potential of design games as an organizational co-development intervention has not been fully explored. Especially the design games applied in service design have been used to interrupt routines and focus on building new understanding about a particular context (Kaario, Vaajakallio, Lehtinen, Kantola, & Kuikkaniemi, 2009) and support the abilities of "everyday people" to design their own environments and working practices (Sanders, 2006). This, in turn, supports organizational learning, as people expand from individual to organizational knowledge and adapt idea gained in play and simulation into organizational life (see Kim, 1993). To examine this, we answer the research question:
How do design games function as playful organizational learning tools?
To answer this, we first introduce expansive learning as a framework for studying organizational learning.

Organizational learning as the development of practices

We look at organizational learning as the development of practices relevant to the collective capabilities of organizations (Gherardi, 2011) in contrast to e.g. individual learning in organizational contexts. Practice theory is interested in the practical knowing that is behind competent everyday action and posits that knowing in practice is inseparable from doing, i.e. that knowledge is not a possession of individuals but rather a continuous social achievement (Gherardi, 2011). The continuous performance of intelligible collaborative action – the *practice* – is always dependent on the social context and shared tools of a *community of practice* (Cook & Brown, 1999; Lave & Wenger, 1991) and always situated in space and time (Gherardi, 2011). Because the capabilities of organizations are ultimately comprised of the continuous, recursive practices of their members, organizations must be able to support the development of practices for organizational learning to take place (Brown & Duguid, 1991; Gherardi, 2011). We believe that design games have previously unidentified potential in supporting this development of practices in organizations.
Activity theory, a strand of practice theory, posits that the unit of analysis when studying practice knowledge should be the activity of a group, i.e. a community of practice. One of the key proponents of modern activity theory has been Yrjö Engeström (1987), who introduced expansive learning as a model for understanding how practices are developed over time by their members. According to expansive learning, the development of practices takes place when the members of a community identify contradictions in their collective activity and respond to the contradictions by reorganizing their activity through identifiable steps (Figure 1). The resulting transformation of the activity represents a change in the practice, and as such organizational learning.

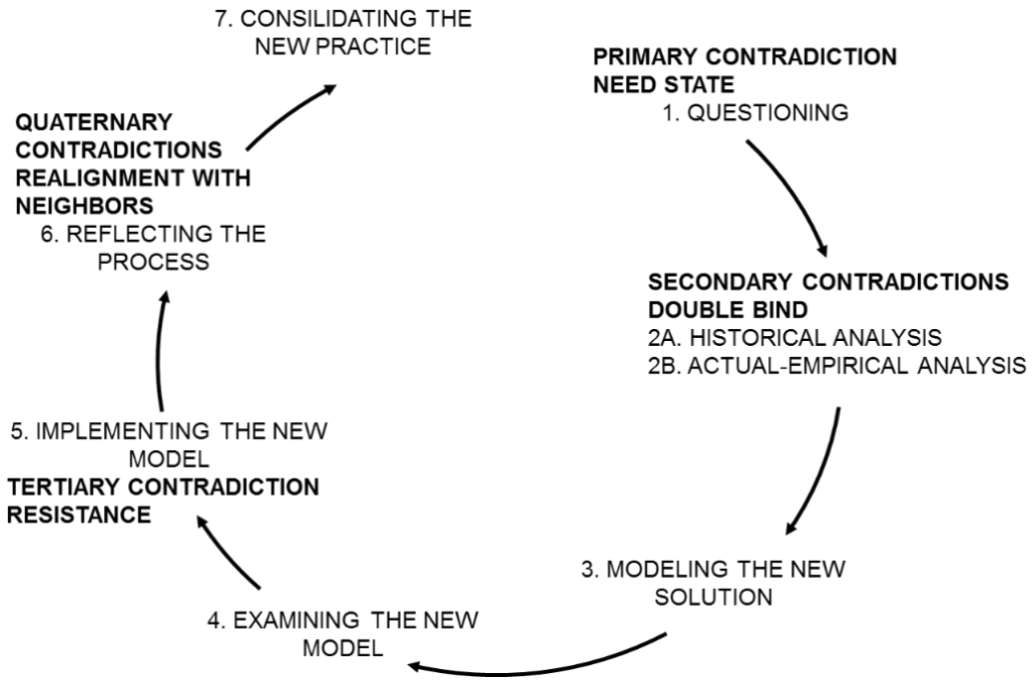

Figure 1 – The expansive learning cycle by Engeström (1999).

In order to transform their activity, members of a community of practice has to overcome four key contradictions associated in expansive learning – although all steps do not necessarily appear in all instances and the steps may appear in a different order (Engeström, 1999). First, when the members identify some fault in their existing practice, they face a *primary contradiction* in which the existing stable practice shifts into an unarticulated *need state* which motivates further inquiry. Through questioning the existing practice, the community faces a *secondary contradiction*, the *double bind* of finding fault in the existing practice without having a new practice to replace it with. As the members begin to construct and test new solutions, the community must overcome the *tertiary contradiction* of matching the new elements of their local practice with the new. As the tertiary contradiction is reconciled, the old local practice is gradually replaced by the new one, and the new practice begins to settle in place. As the new practice is being implemented, neighbouring practices need to be realigned to overcome the *quaternary contradiction* of change in the interconnected practices. (Miettinen & Virkkunen, 2005).

For example, Engeström (2001) describes expansive learning in the complex environment of a children's hospital where different units and departments addressed challenges in working with children with multiple illnesses. First, practitioners *questioned* their current practices by voicing challenges in sharing patient information. Second, the questioning lead to deepening *analyses* which produced more articulated questions regarding the challenges in fragmented patient information and lack of physician in charge. Third, the practitioners collaboratively *modelled* solutions, the first of which were rejected as a part of *examining* the new model. After creating and examining a second model, it's *implementation* was started, setting off its own process of negotiation and alignment. (Engeström, 2001).

While creativity has not been central in the prior research of expansive learning, research in the role of playfulness in creativity in the workplace gives us some guidelines for evaluating the role of creativity in expansive learning. Mainemelis and Ronson (2006) have studied the role of playfulness in fostering creativity in organizations, and named five creativity-relevant cognitive processes supported by play: *problem framing, divergent thinking, mental transformations, practice with alternative solutions,* and *evaluative ability*.

We propose that the creativity-relevant cognitive processes may support overcoming the contradictions in expansive learning. *Problem framing* is the act of deciding how a problem will be solved – a specific formulation of a problem will most often lend itself to some specific solution, and the ability to reframe problems often leads to undiscovered solutions. This is

why design thinking, in contrast, considers problem framing to be the act of understanding the problem from one or more specific perspectives (Dorst, 2011). When challenges are brought into play, the flexible and associative attitude in play encourages the recontextualization of old problems, allowing people to defamiliarize themselves from the known solutions to the existing problems, and instead find new problems and new solutions that make sense in the flexible reality of play. (Mainemelis & Ronson, 2006) This ability to find alternative possibilities in existing formulations of activity may facilitate the identification of contradictions in current practices and to identify the *need-state* that will trigger expansive learning.

Divergent thinking and *mental transformations* are cognitive processes that generate novelty in different ways: while divergent thinking focuses on generating variety of output from the same source in terms of number, variety and breadth, mental transformations generate newness by reconfiguring existing knowledge. Both forms of ideation are plentiful in play in the form association, combination, metaphoric reinterpretation, analogical thinking and similar reconceptualization (Mainemelis & Ronson, 2006). These sources of novelty are important in overcoming the secondary contradiction of expansive learning, the *double bind* of understanding the fault of the current practice without yet having an alternative solution.

Practice with alternative solutions means that decisions are not made prematurely but instead multiple possibilities are entertained simultaneously until they have been given due consideration. The flexible reality and lack of external pressure in play means that alternatives can be considered and come back to without the need to decrease uncertainty or appear decisive. By allowing for multiple answers, play also fosters evaluative ability, and elements from multiple answers can be combined. (Mainemelis & Ronson, 2006) The ability of play to sustain parallel and even contradictory propositions in play gives participants a possibility to better *examine the new model* for a practice before it is implemented, and take steps back to iteratively model and evaluate multiple alternatives.

Based on the understanding of expansive learning as the development of practices and some guidelines on how playfulness might support they points in the expansive learning process, we next describe design games as a potential solution for creating spaces and activities for the playful development of practices.

Design games, from a learning perspective

Design games are a group of games more defined by similarities in use than common factors in their design (Agger Eriksen, Brandt, Mattelmäki, & Vaajakallio, 2014). They can be for example card games, board games, or role-plays, but typically have at least some physical components (Brandt, 2006). The main goal of such games is to foster innovation and reflection through play (Hannula & Harviainen, 2016). The rules of the game function as not just limits, but also facilitators for inspiration, tools for giving all participants equal voices, and ways for keeping the involved stakeholders focused on the task at hand (Brandt, 2006; Hannula & Irrmann, 2016 Klapztein & Cipolla, 2016). They have traditionally been used more in the fuzzy front end of service design, but are increasingly seeing use in also other contexts, from strategy work to organizational applications for knowledge transfer (Harviainen, Vaajakallio, & Sproedt, 2016; Luojus & Harviainen, 2016; Sproedt & Boer, 2011).

To describe the use of design games, we use the Play framework by Kirsikka Vaajakallio (2012) in which design games are simultaneously viewed from three points of view (Table 1). For the designer, the design game is a tool for gathering input from several participants in an organized manner. For the player, the game is a mind-set that allows associative and representational thinking across space and time. Finally, for the designer of a particular design game, the game forms a structure for creating materials and roles for the participants (Vaajakallio, 2012; Vaajakallio & Mattelmäki, 2014).

Table 1 – Play framework, adapted from Vaajakallio and Mattelmäki (2014)

Design Practical application context with its objectives and characteristics	**Designer's perspective:** **design games as a tool** • Organizing dialogue – combining purposes of instrument, competence and an agenda • Supporting empathic understanding – combining subjective and collective interpretations • Gaining several contributions – designing with users and other stakeholders building on direct and indirect user involvement
Games Play-qualities drawn from design and games, play and performance	**Player's perspective:** **design games as a mindset** • Transporting participants into another world – a magic circle as physical and ideal playground • Proceeding within its own boundaries of time and space – symbolic time for moving between past, current and future • Creating positive tension by providing boundaries while being open for new interpretations – action governed by rules
	Game designer's perspective: **design games as a structure** • Supporting idea generation, collaboration and interplay between now and the future by game materials, which work as: visual stimulus for exploring alternatives, boundary object, visual reference for shared focus of attention, documentation, reminder, illustration of progress and as visual indicator of being in a special game world • Utilizing performance roles appointed by the game

Playfulness and creativity are central to design games. In the design game research of Kirsikka Vaajakallio (2012), the magic circle of play (Huizinga, 1949) is an essential part of design games because design games transport players into an ideal playground in which time moves symbolically backwards and forwards, and new connections and interpretations can be created within the constraints of the game. Players are afforded much freedom in interpreting material artefacts and explore diverse possible worlds through open-ended and ambiguous tasks (Vaajakallio & Mattelmäki, 2014).

Despite of their shared elements with games in general, design games are a kind of game where players do not compete against one another, game rules are open to interpretation, and game pieces have intentionally vague meanings (Vaajakallio & Mattelmäki, 2014). This provides the players with opportunities to project their own meaning onto the game material in a process of negotiating a shared language (Vaajakallio & Mattelmäki, 2014). There is, however, a tension in the game of whether the players can overcome the design challenge and what will the eventual product of the game be.

The Play framework describes that for the designer utilizing design games, the playfulness and creativity in design games exist in service to the design process. Design games are employed to organize dialogue and collect contributions from multiple participants, while maintaining close ties to stakeholder groups (Vaajakallio & Mattelmäki, 2014). They are very efficient in fostering collaboration, cooperation, and co-design (Brandt & Messeter, 2004). Design games often also promote exploration at the expense of negotiation or compromise (Brandt, Messeter, & Binder, 2008). Based on accounts from projects in which design games were used at specific points to involve stakeholders, design games excel at building up player capabilities but hold ultimate agency with the designer who keeps ownership of the project surrounding the design game encounter.

We propose that the potential of design games as an organizational co-development intervention has been downplayed: an organization does not need to have a design project underway to use the explorative qualities that design games enable. Especially the design games applied in service design have been used to interrupt routines and focus on building new understanding about a particular context (Kaario et al., 2009). Developing design games to better empower the players in applying creative thinking to their own problems resonates with views that the evolving role of the designer in general involves providing scaffolds for the creativity of "everyday people" (Sanders, 2006).
To bridge the gap between the theoretical understanding of expansive learning in organizations and the use of design games to support reflection which would trigger expansive learning, we aim to conduct empirical research to identify how design games encourage creative discussions. In the following section, we describe our preliminary study of *Topaasia*, a design game created for such a purpose.

Case Topaasia

We examine the learning process in the context of an organizational learning game, *Topaasia* (Figure 2), earlier studied by the authors (Hannula & Harviainen, in press). It is designed and sold by a Finnish company Gälliwashere, which advertises the game as a "consultancy without a consultant". This is because it can be played without a facilitator. From the point of view of service design, *Topaasia* is clearly a design game (as per e.g., Vaajakallio & Mattelmäki, 2014), even as neither of its creators is a service designer. *Topaasia* games combine a dialogue for developing practices (as per Hannula & Harviainen, 2016) with simple game rules that structure the discussion on shared topics and provide some competitiveness to the interaction. *Topaasia* is intended to be played in multiple short sessions over a longer period for continuous reflection. For discussions around different topics, decks such as "Sales", "Projects" and "Agility" are available, which follow the same rules with different cards. The creators of *Topaasia* constantly produce new decks and improve old ones through both experimentation and customer interaction.

Figure 2 – A *Topaasia* deck, package and hourglass timer. (Promotional picture, Gälliwashere.)

In *Topaasia*, players draw cards from the deck they are using to form a hand of four cards. Each deck has 52 cards, each with a suit corresponding to a theme of development within

the deck, as well as a keyword which refers to a specific item of within that theme. Each round begins by drawing a perspective such as "our strongest" or "our hardest" after which each player selects a card from their hand that best fits the perspective. The played cards are shuffled to hide which player chose which card and then revealed for everyone to see (Figure 3). Through discussion, the players together choose the most important card to fit the perspective within a time limit enforced by an hourglass included with the game. Finally, the player whose card was selected is revealed, that player gets a point (if scoring is used) and the group moves to a new perspective. One game takes from 30 to 45 minutes of play, and can optimally accommodate four to eight players.

Figure 3 – Actual play: players discuss which of the four cards to choose. (*Gälliwashere*.)

To facilitate a dialogue on developing practices, the game uses cards to act as shared points of reference. First, the text on the cards act as a trigger for the player to consider the potential of each card in their hand and choose the most important out of those cards (Hannula & Harviainen, in press). Second, once each player has played their most important topic, the collective best cards are discussed without going into the details of how each challenge might be solved. In this way, many topics get considered each turn but the players are forced by the game rules to compare the topics and come to a shared conclusion on the most important topics for development.

Because of the randomisation, some important subjects may not come up for discussion, simply because the card of that topic was not in anyone's hand at the right time. Gälliwashere therefore recommends that for best results, the game should be played multiple times at intervals of e.g., once per month.

A key feature of *Topaasia* during this research was the explicit goal of getting the most points by playing cards that will be picked the best by the group. Because of this competition, the game might be perceived to be more engaging than design games without competitive elements or explicit winners (such as ATLAS, documented in Hannula & Irrmann, 2016). However, the competition created an anticipatory mechanic to the game: if players wanted to win, they might play cards that are likely to score a round of the game, instead of choosing subjects based on their importance for the organization. Because of this possible problem, later editions of the game turned formal scoring into an optional mechanic. Nevertheless, there too the presence of "whose idea was picked" remains strong.

Empirical study

Examining any sort of game-based organizational learning is difficult, because of the number of factors involved (Klabbers, 2003b). No commonly shared theory of game-based learning exists and the field therefore often relies on case study based extrapolation (Harviainen, Lainema, & Saarinen, 2014). We therefore set out to study a game used for the express purpose of organizational learning and knowledge co-creation, using data provided by the game's players through a summary system. In addition, we reviewed customer stories on the use of *Topaasia*, which Gälliwashere presents on their website, and looked for direct expressions of game-based learning experiences. From these, we formed a preliminary set of data, used as the basis of testing whether the theory of expansive learning would answer questions about play, learning, and time-efficiency experiences with *Topaasia*.

As noted by Ketokivi and Choi (2014), case studies are useful for three different but connected purposes: theory generation, theory testing and theory elaboration. In this paper, we focus on initial testing as well the directions for potential elaboration, through the presentation of the tested framework, expansive learning. Case research may be descriptive, exploratory, or explanatory (Eisenhardt, 1989; Yin, 2009). Here, we use it to describe time-efficiency experiences as well as to develop and initially test our theory.

The data used in this paper comes from Gälliwashere. Their players have access to a summary/feedback system, *Kiteyttäjä*. It provides the designers with use and evaluation data, while summarizing the results of each session for the players, and sends reminders for e.g., next play session and for putting the results of the play into actual use in the organization. The system has been altered over time, as have the decks. We have therefore focused our analysis in this paper to only the set of five questions that was used in all versions. It is presented in Table 2.

Table 2 – Core feedback questions of *Topaasia* (Hannula & Harviainen, in press).

How useful was the session, compared to the time you used? (1=No benefit compared to time; 3= Equally useful compared to time [as other methods]; 5=Produced significantly more value compared to time.)
How well was the play session organized on a scale of 1-5, with 5 being the best?
Do you have suggestions on how the session could have been improved?
What functioned well in the session?
Other feedback?

At the time of writing this article, about 500 *Topaasia* decks have been sold, to over 100 companies. We do not have precise numbers on actual use, because using the feedback system, *Kiteyttäjä*, is voluntary. It furthermore has no user satisfaction marker right now, so we have relied on older sets of data, as well as written statements by Gälliwashere's clients. A total of 53 *Kiteyttäjä* answers were received from play sessions with the older version (January 1, 2015 to May 12, 2016), and 54 with a new version (May 13, 2016 to August 19, 2016). We next analyse those results.

Results

Kiteyttäjä requires that people answer together in teams, through group consensus, and not as individuals. Two central findings could be determined from the data set, the first of which was also analysed by the authors in an earlier work (Hannula & Harviainen, in press), and is re-iterated here for further discussion in a new context: Numerical scales pointed to the perception that the game was consistently found to be useful and time-effective. Average time-effectiveness ratio was in the older *Kiteyttäjä* 3.74 (n=53), and 3.78 (n=54) in the new one. The most common answer was 4, "somewhat more time-effective than other methods" (n=66), with 10 respondents considering it "extremely useful" (rating 5). This means that 71% off the respondents considered *Topaasia* a superior learning tool, compared to others.

28 respondents, in turn, found *Topaasia* as useful as other methods they had tried, i.e., gave it a rating of 3. No ratings of 1 (the lowest) were in either data set, and they had only one rating of 2 each. Later sessions scored significantly higher than the early ones. This strongly suggests that Gälliwashere's iterative approach to constantly improve the game and its rules is working. The results also suggest that regardless of whether actual learning took place, the players thought they, and thus the organization, was learning.

Figure 4 – Actual play: discussion on a difficult topic, with several time-extension "Joker" cards in use. (*Gälliwashere*.)

The new data - player stories, provided on the company website (Gälliwashere: Asiakastarinat) and other media - expand on the experience of time-efficiency and add points of learning. For example, corporate client Johanna Pystynen of the company *Vincit* states that they regularly use *Topaasia* at the start of projects.

> *The game eases the team's discussions and guides participants to talk about the project's practices, praxis, challenges as well as successes. It grants a way to bring up also difficult subjects more easily. In addition, every member of the team gets an equal say on things during play. Feedback from our employees has been positive and the [game-based] project starts have been considered useful almost every time." (Johanna Pystynen, translation by 2nd Author).*

Saana Rossi, from the same company, also described the reception of the game positively.

> *The game has been a well-liked, functional, and efficient way to close in on risks and areas of development. It forces people to participate in open discussion, and enables that discussion. It also brings forth things from the perspectives of both risks and successes, in ways that one would not otherwise think of. The play sessions have been solution-oriented: we focus on the essential and think of the steps we need to take to proceed. (Saana Rossi, translation by 2nd Author).*

Other player-client stories included successfully changing the structure of sales meetings, increased focus on discussion during play, and participants engaging in much more active and productive discussions facilitated by the game's rules.
All customer testimonials feature elements of expansive organizational learning, facilitated through shared, fruitful dialogue made possible by the game as a boundary object (Bergman, Lyytinen, & Mark, 2007; Tsoukas, 2009). We propose that examining the *Topaasia* games

from the point of view of expansive learning provides an opportunity to address an important issue of employee empowerment and utilization of creativity in organizations. It must be noted, however, that *Topaasia* proved to be backcasting-oriented, i.e. based on revisiting past experiences rather than designing possible futures like in the design games described by Vaajakallio and Mattelmäki (2014). This is not necessarily a bad thing: the identification of existing challenges, risks and potentials through the examination of current understanding is an important part of organizational learning that can be facilitated though organizational gaming. From this viewpoint, *Topaasia* games provide a crucial insight on the current state of the organizations in which they are played.

Conclusions

The main goal of a design game, we believe, is to foster creative discourse on an equal basis that takes many stakeholders into account. User responses from *Topaasia* very strongly point to this taking place. With players reporting time-efficiency, commitment to play and dialogue, and hint at actual implementation of the found ideas, we can perceive expansive learning processes taking place. Makings sure that the dialogues are productive and positive is not easy, but it appears that design gaming can make people share, rather than hoard, what they know, and to appreciate ideas brought forth by others.

Topaasia appears to work as a productive scaffold for knowledge creation. Like many other good design games, it contains its own debriefing and assessment to some extent, as the play itself is a form of reflection (As per Hannula & Harviainen, 2016). By playing, participants have access to each other's tacit knowledge and emerging new insights. They may also be able to together locate problems and advantages that would otherwise not be found, as the written responses especially noted. They furthermore make their players see time spent on them as more effective, and thus more easily contributed, a factor known to increase learning through time-on-task (Landers & Landers, 2014). Their playful nature, in turn, makes people more motivated to participate, shields them from social repercussions of critique, and enables the sharing of temporal propositions that are necessary for efficient strategizing (Apter, 1991; Vesa, Hamari, Harviainen, & Warmelink, 2017). The expansive learning potential of these kinds of games is in providing methods for interrupting the routines of organizations by allowing players to "bring in" their existing practices and contradictions and setting up a space in which the players feel at liberty to engage in playful examination of the existing practices and modelling new solutions.

A central question for further research remains: even as players and organizations using *Topaasia* found the use of the game to be efficient and useful, we do not yet have concrete evidence of their efficacy. A gap exists between idea generation and actual implementation (Vaajakallio, 2012). To foster functional design, the game's processes have to reflect the external world, and in turn provide results for that work (Klabbers, 2003a). While no direct data exists yet, it appears that *Topaasia* follows the first criterion because it brings existing processes in organizations into play. The next step is to analyse whether the insights created or found through play become actual practices and developments.

Ethical and Funding Statements

The authors have no connection to Gälliwashere excluding this research project. Pictures used with permission from Gälliwashere.

Parts of this research were supported by grant 10-5514 from Liikesivistysrahasto.

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