

## Investigating perspectives on play: the lenses of play tool

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# Investigating Perspectives on Play: The Lenses of Play Tool

**Tilde Bekker**

Industrial Design Department,  
Eindhoven University of  
Technology, the Netherlands  
m.m.bekker@tue.nl

**Linda de Valk**

Industrial Design Department,  
Eindhoven University of  
Technology, the Netherlands  
l.c.t.d.valk@tue.nl

**Pepijn Rijnbout**

Industrial Design Department,  
Eindhoven University of  
Technology, the Netherlands  
p.rijnbout@tue.nl

**Mark de Graaf**

Industrial Design Department,  
Eindhoven University of  
Technology, the Netherlands  
m.j.d.graaf@tue.nl

**Ben Schouten**

Industrial Design Department,  
Eindhoven University of  
Technology, the Netherlands  
bschouten@tue.nl

**Berry Eggen**

Industrial Design Department,  
Eindhoven University of  
Technology, the Netherlands  
j.h.eggen@tue.nl

**Abstract**

This paper presents a new design tool for developing interactive playful environments. This design tool consists of a number of cards, which explain five perspectives or lenses on play. We describe three user evaluations that were carried out with the design tool and discuss how participants used the tool in their design activities and what they considered to be the value of the tool. The evaluations were mainly focused on two lenses: open-ended play and emergence. The tool provides inspiration for students, and other design researchers and practitioners working in the field of interactivity and play.

**Author Keywords**

Play, emergence, design, playful experiences, design tool.

**ACM Classification Keywords**

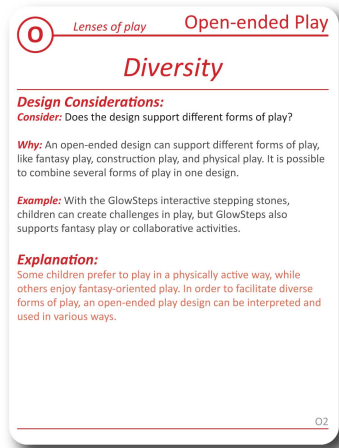
H.5.2. User Interfaces.

**Introduction**

Interactive technology is becoming more and more present in children's play activities. Sensors and actuators are integrated in for instance toys, game consoles and playground equipment. Play is a dynamic process and over longer periods, the play activities transform continuously. It is a challenge for designers

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**Figure 1.** An example card of the open-ended play lens.

of interactive play environments to provide opportunities for this. We explore how to design interactive play environments and other playful interaction solutions that motivate social and physical play behavior. In our approach we combine design aspects of open-ended interaction [9] and decentralized systems [6].

In Rijnbout et al. [7] an initial framework is presented that combines knowledge from different fields, including play, user experience, emergent behavior and human-computer interaction into a structured overview. The framework illustrates links between the designed objects and interactions on a low level and the emergent events and play experiences on a high level. Wood [10] presented one play lens, focusing on open and self-expressive play. In Bekker et al. [2] the background for four different perspectives on play was described: open-ended play, playful experiences (grounded in the work by [1]), forms of play and stages of play.

We have worked on the development of a hands-on design tool that presents different perspectives on play and emergence and that can support designers in creating interactive designs for play. We have added a fifth lens as compared to the work in [7], related to research focused on decentralized systems, namely: emergence. This lens is the result of explorations of interactive play environments inspired by occurrences of emergence in natural systems.

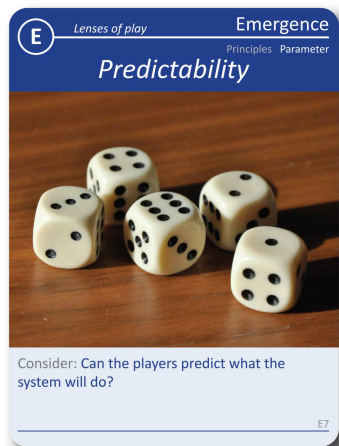
Designing interactive playful environments for open-ended play, create a challenge, on the one hand, in providing freedom for users to define play, and, on the other hand, in creating an interactive system that is

able to provide play opportunities in a meaningful way. The lens of emergence can help to enhance this balance. It helps the designer to switch between two perspectives: the perspective of play and the perspective of systems. [8]. Where the four lenses presented in [2] are related to the play perspective, the emergence lens is related to the system perspective.

The tool can support students and design practitioners in designing interactive playful environments. In order to explore the usefulness and value of the tool, we carried out three user explorations. Two of these studies were with university design students, the third study with students from vocational education in multimedia design.

### Card-based design tools

Card-based design tools are often used to make intermediate design knowledge easily available to designers. Intermediate design knowledge is knowledge grounded in theory [3], but translated to be more easily applicable to designers. Examples are guidelines and heuristics. Design researchers have created diverse card tools already. For example, Hornecker developed cards to present information from her tangible interaction framework to designers [5]. Deng et al. have developed Tango Cards, which provide information about tangible learning games [4]. Korhonen et al. created the PLEX Cards to communicate the PLEX framework for playful experiences [1]. Card tools are an easy way to provide information. They can help structure discussions and help designers consider different perspectives in design [5, 4]. Deng et al. paid special attention to developing a template for presenting intermediate design knowledge. We have followed her template on our cards, including what to



**Figure 2.** An example card of the emergence lens

consider when making design decisions, why this is important and an example.

### Design tool

We developed an initial card set of two of the lenses (which are the core lenses of our research): open-ended play and emergence. With these cards, we aim to make design knowledge on these two perspectives of play that we gathered through several design research activities accessible to designers.

#### Cards design

The cards all have the same global layout. Each card's front side has a title, a picture, a design consideration, a rationale and an example as well as a label "Lenses of play: Open-ended play" or "Lenses of play: Emergence" (see Figures 1 and 2).

For the open-ended play lens, we developed six cards. Some cards, address considerations on a abstract level, like design context and design decisions, others are more concrete such as being open to interpretation.

The emergence lens consists of 12 cards and included two subsets: six cards with *emergence principles* and six cards with *emergence parameters*. The principles are known examples of emergent behavior inspired by nature or culture, such as swarming and clustering. Those principles can be used as inspiration during ideation of dynamics in system for open-ended play. The emergence parameter cards provide 6 different characteristics (such as visibility, relatedness and progression) that influence (e.g. strengthening or weakening) the dynamic behavior, The parameter cards can be used to elaborate, evaluate or develop play-concepts further.

In order for our cards to be applicable in the design process, we made the information on the cards to-the-point and quickly understandable. Moreover, we added inspiring pictures and examples to the cards to further illustrate the considerations.

In Fig. 1 and 2 the final design of the cards is presented. This design has slightly changed between the user evaluations presented in the following. In specific, explanations of the principles were moved to the back of the cards and the images have been enlarged. One emergence parameter card was added. On some cards the explanations and examples were improved.

### User evaluations

We carried out three explorative user evaluations to examine the usage of the cards. These evaluations consisted of two design workshops, of half a day each, and a one-week module on the design of interactive light objects. All participants were students.

#### User evaluation 1: Summer school workshop

During an international summer school on games and play research (in Utrecht in the Netherlands), we gave a design workshop. A total of 21 Bachelor, Master and PhD Students participated in the workshop. These participants represented a wide variety of backgrounds. The participants were divided in five groups of four to five persons to work on the assignment.

First, the organizers of the workshops gave a presentation about the five lenses and the design tool. Then the design assignment of the workshop was also explained: to make a **redesign** of an interactive play environment consisting of interactive tiles that light up

in different configurations according to the play dynamics of the users. This gave the participants a concrete start and as time was limited they could immediately start with the actual design process.

We made real-time observations of all groups working on the design assignment. The workshop ended with group interviews during which the researchers asked each group about their experiences of using the cards. The feedback of participants was used to make a next iteration of the cards.

#### *User evaluation 2: Zadkine workshop*

Forty Human Technology students (intermediate vocational education) participated in this workshop, divided over two sessions (morning and afternoon).

The program of the workshop was the same as User evaluation 1. After the presentation, the participants worked on the design assignment in groups of 2 to 5 students for approximately one hour. They chose a number of cards to work with (2-5). The students used the cards to reflect on, and to create a redesign of a game they had already designed for a specific urban location in Rotterdam (The Wilhelmina Pier). During the workshop, the researchers walked around to carry out informal observations. At the end of the workshop, students were asked to give feedback on the Lenses of Play cards.

#### *User evaluation 3: Biotopia course*

The third evaluation was during the course 'Biotopia' at the Eindhoven University of Technology in which 18 master design students created a system of personality based interactive light objects. Students were engaged in the activity for a full week, and worked in teams of 4

to 5. The cards were shortly introduced at the start of the week, and proposed as a tool to be used freely at their own discretion. This way we aimed to explore for what activities within the design process students would use the cards.

Students were free to use or ignore the cards, and apart from the short introduction at the start of the week there was no further coordinated guidance on the use of the cards, yet students were free to ask questions where needed. At the end of the week, the use of the cards was evaluated in separate meetings with each student team.

## **Results**

#### *User evaluation 1: Summer school workshop*

All participants were able to work with the card sets during the workshop. They remarked that the cards supported them in various ways, such as giving inspiration, helping in analyzing initial concepts for play design and structuring their ideas even further. During the initial phase of idea generation, the cards were helpful to get some inspiration for first ideas. Further on in the process of developing new ideas, the cards gave inspiration for further thinking and discussions and as a reference to clarify certain concepts. The cards helped to modify initial ideas by optimizing different ideas such as emergent behavior of the play system, by tuning different parameters. In this way, the cards were helpful in looking at a design problem from different perspectives.

The participants experienced differences between the information described in the two lenses. The cards of the open-ended play lens were more abstract than the cards of the emergence lens. For some groups, this also

influenced how they used the cards. Depending on the background of the students, the knowledge of the different cards were more novel to them, e.g. the students who has less game design experience, were inspired by the open-ended lens cards, whereas the students who already had more game design experience were more inspired by the emergence cards. Participants reported some improvement points for the cards. For instance, they discussed that there was a high density of information, which could be better divided over the front and back of the cards.

#### *User evaluation 2: Zadkine workshop*

Despite some initial frustration about reopening a project that they had believed was already completed, students were unanimously positive about the workshop. They mostly liked the hands on character of the tool and had a lot of fun during the activity. At the end of the workshop, they explicitly asked if the activity could become embedded in their curriculum structurally. Only the short – less than 15 minutes - introduction was less appreciated. They preferred starting the activity as soon as possible. They did not experience problems understanding the cards; however we did observe that they merely selecting the ones that made most sense to them.

#### *User evaluation 3: Biotopia course*

The cards were used by two of the four teams, and in a variety of ways, during different stages of the design process. At an early stage they were used as a broad explorative brainstorm tool. Typically, students would select 2 to 4 cards at a time from the toolkit that were most appealing to them and start brainstorming. Combinations of emergence and open-ended play cards were made spontaneously. In a later stage the cards

were used as a tool to develop the concepts in more depth. Finally, at the end of the week cards were used as a reflective tool that helped to better ground their design decisions in literature.

The main advantage of the low-profile approach of this exploration was that the tool was used in a very natural way, during a full week activity. The downside was that evaluation of the cards was at the end of a very intense design week, and only half of the participants had actually used them.

### **Conclusion**

In this paper, we present a new design tool for designing playful interactive environments. This tool presents information to designers on five different perspectives or lenses: open-ended play, playful experiences, forms of play, stages of play and emergence.

We evaluated the usage and value of two of the five lenses of the tool: open-ended play and emergence. The results from these first explorations are promising; they indicate that the lenses are broadly applicable for a wide variety of users. More specifically, the cards provided inspiration in different phases of the design process, including initial brainstorming and later redesign activities. They proved helpful in analyzing initial concepts and in structuring information to clarify, reflect upon and ground design decisions. We expect the tool to be valuable for design practitioners and researchers who are not yet experienced in this field, as well as for students learning to design for open-ended play and other playful interactions.

## Discussion & Future work

We only used two of the five lenses, with a total of eighteen cards, in the explorations reported in this paper. In practice we saw that participants select only two to maximum four of these cards were at any time during any concrete design activity. When presenting all five lenses, it would be useful to provide suggestions on how to select which and how many of the lenses to consider during the design process.

So far our evaluation has covered the use of the lenses during shorter design activities with students. In presentations to industry, we have already received interest in the card tool.

Future work will concentrate on the improvement of the individual cards, the lenses, and the total card set. We will evaluate the cards in workshops in which design professionals are invited to participate, and also examine further the applicability to other playful systems such as location-based games.

## Acknowledgements

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