

Chapter 6

Case Example: KIKATOPIA Game—A Simulation Game on Diversity and Living Together with Children as Co-designers



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Abstract In this chapter, we illustrate some of the basic concepts of gaming simulation (see Chap. 1 for terminology and fundamentals). We also use a case example to provide context for subsequent chapters on the use of games for education. Our case focuses on a game for players aged 10–14 years, which a team of children co-designed with us. The game was concerned with how to coexist peacefully in a modern society (Germany) that is becoming increasingly complex and diverse. We also discuss how the design process and content of the game are associated with ethical challenges. We believe that this case example can shed light on some of the risks, challenges, and opportunities associated with the use of games as cultural commodities. In addition, we show that co-designing games offers opportunities for improving education, knowledge, and skills of children, by developing their values and attitudes and improving their self-concept.

Keywords Game design · Co-design · Education · Self-concept · Diversity · Living together · Culture · Ethics

6.1 Background of the KIKATOPIA Game

In 2017, the German children’s television channel, Kinder-Kanal (KiKA), proposed using a simulation game as the focus for one of its upcoming programs. KiKA is a free-to-air German television channel based in Erfurt. It is managed by the two main public-service broadcasters: ARD and ZDF. The channel is generally watched by children aged 3–14 years. KiKA ran programs with the theme “Living together, now

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Fig. 6.1 Design team

and in the future”, for 1 week. For children aged 10–14 years, one of the most popular shows was “Erde an Zukunft” (“Earth to Future”). The editorial office of KiKA proposed a 30-min special broadcast to address the following questions: “How can people of different origins, skin colours and religions live together harmoniously in Germany, given that their value systems may differ?” and “How do we want to live together in the future?” For this special broadcast, KiKA asked us to design a simulation game, the gameplay and debriefing of which would be recorded and shown on the television show. As one of our design principles (based on Duke, 1974) is to include the relevant stakeholders in the design process, we invited the editors at KiKA to accompany us and a group of children (selected as representatives of the target audience) to join the show’s anchorman, Felix, on a new “adventure”. We proposed that 12 children should act as co-designers of the game. We also proposed that the game design process, gameplay, and debriefing be recorded as content for the show (Fig. 6.1).

The following is a quote from the official press release, illustrating our approach and summarizing our remit:

How do we want to live together in the future?—To answer this question, ERDE AN ZUKUNFT is launching a unique project. Twelve young “future-makers” are developing a simulation game with guidance from two experts, with the aim of promoting harmonious coexistence in the future. The anchor-man of ERDE AN ZUKUNFT, Felix, will accompany and support our future-makers from Hamburg in this exciting process.

Six sixth-grade students from The Catholic School of Altona will meet with the game developers, Prof. Dr. Thomas Eberle and Prof. Dr. Willy Kriz, to discuss the project. Six students from class 6b of the Gymnasium Allee, Altona, will also participate. These students will visit special “places of diversity”, such as the former “problem district” of Wilhelmsburg, Hamburg Airport, a “melting pot” pop music studio with underage refugees, and a junior football team (FC St. Pauli).

Over a 5-month period, the children will help to develop the ERDE AN ZUKUNFT simulation game during three workshops in conjunction with the two professors, based on their personal experience. The game is aimed at promoting the coexistence of people from different origins and cultures and deriving solutions to conflicts. Felix will solicit the children’s perspectives and ideas during this exciting process. The EARTH TO FUTURE

simulation game (KIKATOPIA) will also be made available to other children and schools, inspiring them to develop their own ideas for harmonious future living.

This exciting project, the development and implementation of which will rely on the motivations and ideas of the future makers, reflects the thematic focus of KiKA.

6.2 Basic Pedagogical Principles

For many designers and companies, children and families are the target group for products, which are designed based on pre-existing studies to make them attractive. The “KIKATOPIA—City of the future” project is different; designing a simulation with children, as opposed to for children, was the key concept. We selected a diverse group of children as co-designers, because children in Germany are becoming increasingly ethnically diverse and because the game itself focused on dealing with the potential conflicts that might arise in a culturally diverse society. Therefore, the selected children had different cultural backgrounds, religions, genders, and identities. Some of the children had immigrated to Germany, others did not have German as their native language, and some came from families with below-average socioeconomic status. These children constituted the design team, and they were guided by the authors.

Many game design frameworks recommend including the target population as important stakeholders, not only in the prototype testing process but also in the whole design process (e.g. the well-known 21-step policy game design method of Duke & Geurts, 2004). However, children are not typically seen as co-designers. We have argued that the learning environment is enhanced when students are given the opportunity to design games (Kriz & Eberle, 2004; Kriz & Manahl, 2016). Including students (or more generally, representatives of the target group) offers them the opportunity to set their own learning goals, actively co-construct models of reality, and define game rules. During the design process, as a “self-organizing learning environment”, the communication modes of the group can be observed, as well as the mental models and systems of representation of the individual co-designers. Common values, goals, rules, social representations of reality, and strategies for managing complex systems can be mutually derived (Kriz, 2003; De Caluwé et al., 2008). A gaming simulation design task provides an ideal environment for acquiring social skills, (re)constructing sustainable social systems, and dealing with the complexity and ambiguity of modern life. Another advantage of including representatives of the target group as co-designers is that they not only acquire new knowledge, competencies, and strategies in the context of existing norms (single-loop learning) but also obtain a deeper understanding of convictions, judgments, and rules, as in a double-loop learning system (Argyris & Schön, 1996).

From an ethical perspective, to deal with the increasing complexity of society, as well as with the issues of coexistence and conflict resolution from the perspective of diversity, it is important that children are given opportunities to explore alternative futures that go beyond the conditions set by adults. As Albert Einstein stated, we cannot solve our problems using the same thinking that gave rise to them. Problems

created by adults must be resolved via innovative ideas, especially from the unique and fresh perspective of children. Regarding whether children are able to deal with complexity, our basic pedagogical position is that they should be given as much responsibility as possible and they should be trusted and supported in such a way that they develop a sense of competence. This approach also seems to be fruitful for developing the self-concept of children.

6.3 Opportunities for Experiential Learning and Improving Self-Concept via Simulation Games

Experiential learning, as a form of competence-oriented, student-centred education, can influence participants' attitudes, self-concept, self-recognition, motivations, skills, and actions (see OECD Learning Compass 2030 and the OECD Future of Education and Skills 2030 project; www.oecd.org/education/2030-project/). In the experiential learning cycle, Kolb (1984) describes the connection between experience and future action. According to the theory of experiential learning, learning is a circular process involving concrete experience, observation, and reflection, the forming of abstract concepts and generalizations, and the testing of concepts in new situations. Gaming can be seen as an experiential learning environment (Garris et al., 2002; Kolb et al., 2014; see also Chap. 1 of this book).

William James (1890) distinguished between I (the inner perspective) and me (the perspective of the social self). The tension between self-recognition and information conveyed by others fosters change. Major personality theories, such as the "Big Five Traits", are helpful. However, scientific debate regarding a sixth trait is intensifying, namely, the stability and flexibility of the self. Haußer (1995) published a model including situational and generalized components of identity. A 2×6 spreadsheet was devised showing cognitive, affective, and action-related components of identity, in situational and general forms. Situational components may be modified by actual experiences that lead to general representations of the self. During the past few decades, psychological research has changed society's view on the concept of personality. The notion of a stable character has been supplanted by a more flexible and situation-specific view of personality traits. In addition, self-related cognitions are no longer viewed in general terms, but rather as being situation dependent.

Experiences accrued in our everyday private and professional lives promote changes in self-concept. However, changing negative self-conceptions has proven more difficult than expected. Researchers have investigated people (especially pupils) with low self-esteem and negative self-concepts; such individuals have also been the target of interventions. During reattribution training, success is experienced according to the individual's self-esteem: people with a poor self-concept may tend to say "it was easy" or "I was lucky", whereas those with a higher self-concept are more likely to say "I am competent", "I have abilities", or "I am gifted".

The self-concept pertains to one's thoughts about the self, while self-esteem can be defined as evaluations of the self that can be positive or negative (Smith & Mackie, 2007). Self-concept is one of the most frequently researched constructs within the field of adventure education (Hattie et al., 1997; Eberle, 2005). The self-efficacy scale of Schwarzer and Jerusalem (1995) is highly popular among studies on the effects of experiential learning on the self-concept. Sub-concepts include physical, emotional, and cognitive aspects of self-efficacy. Simulation and gaming often focus on the learning of concepts, understanding of interrelationships, and development of skills. However, simulations and games may have even greater potential for influencing self-concept (Eberle, 2003). Studies have shown immediate positive effects of experiential learning on the self-concept. Long-term effects have also been demonstrated (Neill, 2008), which can be explained in terms of reflections on experiences and proof of concept in daily life. Gaming simulation promotes reflection on gameplay through debriefing and application to the real world (Eberle & Kriz, 2017). Therefore, simulation games are well suited for effecting positive changes in the self-concept and self-efficacy beliefs (Eberle, 2019). Involving children in gameplay and design may promote the development of a more positive self-concept. As co-designers, children have the opportunity to experience themselves as competent and responsible. By participating in the entire process of gaming, children perceive their interests, ideas, and knowledge to be valuable. Through positive feedback, debriefing, and reinforcement by adult game facilitators, game designers, and peers in the design team, children are encouraged to attribute successful game development and gameplay outcomes to their own efforts.

6.4 Design Steps and Results of the Project

The main steps of the three design workshops are listed below. Each step was recorded and used in the production of the TV show.

1. Allowing the children to play simulation games and providing information about simulation and gaming.
2. Discussing in small groups the most important aspects of the children's future lives. What are their own core values? Are there any particular values that have a higher priority? What do they and their loved ones need to ensure humane, future-oriented lives?
3. Experiencing situations that are relevant in terms of diversity and its associated challenges, risks, conflicts, and opportunities (Figs. 6.2, 6.3, and 6.4).
4. Executing an as-is analysis of real-world data. After identifying some places of diversity, the children, in four small groups, visited and interviewed people to understand how they live and work together (a multicultural former "problem district" of Hamburg; Hamburg Airport, including a prayer room for several faiths; a "melting pot" pop music studio with underage refugees; and a diverse junior football team of FC St. Pauli).



Fig. 6.2 Children playing simulation games to get an understanding (left), defining own core values and aspects of a good life (right)



Fig. 6.3 Children defining places of diversity, challenges, risks, conflicts, and opportunities in a modern society



Fig. 6.4 Children doing as-is analysis with interviews at chosen places of diversity in the real world



Fig. 6.5 Children developing the game



Fig. 6.6 Main elements designed by children: idea of game board representing space in a city; idea of infrastructure elements and their representation, kids discussing ideas

5. Generating ideas for designing a simulation game. The children discussed potential game ideas and mechanisms (roles, rules, events, decisions, etc.) based on their own perceptions.
6. Designing and developing the game through iterative cycles.
7. Development of ideas (during a workshop) for regulations and laws that the children believed would help the future population of a city (not only children) have a good life.
8. Testing and playing prototype games and continuing to develop them (Figs. 6.5 and 6.6).

KIKATOPIA was played several times by groups of children, and then further developed and modified. Six children who were unfamiliar with the final simulation game's rules and events played the game in the studio. The final version differs somewhat from that provided to schools and educational institutions, with the latter being simplified for reasons of cost and feasibility, but nevertheless having good educational possibilities with respect to diversity. For example, when played by several groups in parallel in a classroom setting, players can visit other KIKATOPIA cities and reflect on the aspects that make their own city attractive to tourists and potential immigrants. Players may be inspired by these other cities. The final steps in the studio were as follows:

1. Playing the final version of the game using materials designed to meet the requirements of a television studio.



Fig. 6.7 Test play in workshops (left) and final play in TV studio (right)

2. Obtaining feedback on decisions made as players.
3. Participating in the game debriefing.
4. Participating in interviews for the show (Fig. 6.7).

An evaluation of the design process was also conducted, involving all stakeholders. In interviews, the following feedback was provided by the design team, KiKA stakeholders (program managers, editors of the television show, etc.), and its viewers (children and parents):

- Being involved in the design process was important for developing the self-concept of the design team members.
- The design team members were proud of the game developed based on their own ideas, and the television studio context enhanced their feeling of self-efficacy.
- The project proved that children can be effective co-designers.
- As co-designers, the children could create a simulation reflecting their own values and ideas.
- The children felt actively involved and displayed critical thinking regarding harmonious coexistence in a heterogeneous, complex world; the game design process helped them identify issues that are particularly important.
- The children perceived our trust in them and confidence in their capacity to act independently, feeling that we were interested in their points of view and trusted them to make responsible decisions.
- The children viewed the opportunity to think seriously about the future as a positive experience and identified themes and concerns relevant to future development (e.g. nature, social cohesion, social welfare, migration, prosperity, and economic development).
- The children identified with their role as urban developers aiming to ensure the well-being of all citizens.
- Children learned through designing, playing, and watching the simulation game, which involved complex situations. The children observed the effects of their decisions and regulations on several relevant aspects of life and cohabitation.

- The simulation and game offered realistic opportunities for action, decision-making, and learning. The children viewed this as a challenging but highly motivating task.
- The stakeholders were pleasantly surprised by how the children made professional and thoughtful decisions when designing and playing the simulation game; they developed a city, responded to natural disasters and terrorist attacks (i.e. took measures to mitigate the negative effects thereof), and sought to develop a positive future.

6.5 Main Characteristics and Elements of the KIKATOPIA Game.

The basic idea of KIKATOPIA is to promote harmonious coexistence within a simulated city. The children developed game design elements that were implemented into the simulation as much as possible.

In KIKATOPIA, players assume several different roles, including planning and building a city gradually as urban planners, starting with an undeveloped plot of land. The cities built in KIKATOPIA are relatively small scale and based partly on the structures inherent to a modern state, particularly those that are important for the learning process. The children made decisions on types of investments, managed the city budget, and developed residential neighbourhoods, infrastructure, and service companies, as well as educational, commercial, and industrial institutions (Fig. 6.8).

Additionally, they played the role of city councillors, making investment decisions and enacting laws and regulations to facilitate the coexistence of the simulated population (in the game, they have slightly greater powers than actual city councillors).

Third, the players assumed the role of a self-determined character. To create an in-game avatar, the so-called player pass is used, based on the central theme of diversity among other elements of the game. Here, it is important to emphasize that the players have considerable freedom; they can use their “true self” as a template or

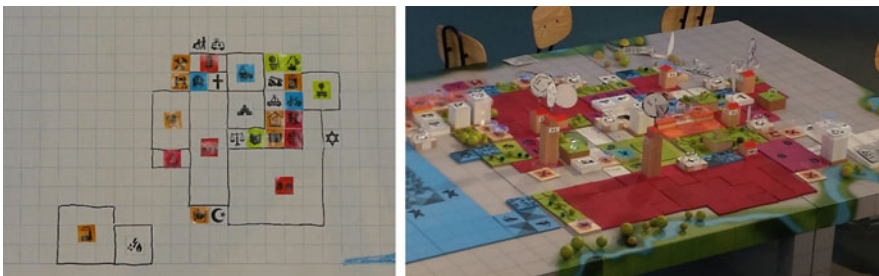


Fig. 6.8 City-of-the-Future KIKATOPIA develops in the school version (left) and in the TV show version (right)

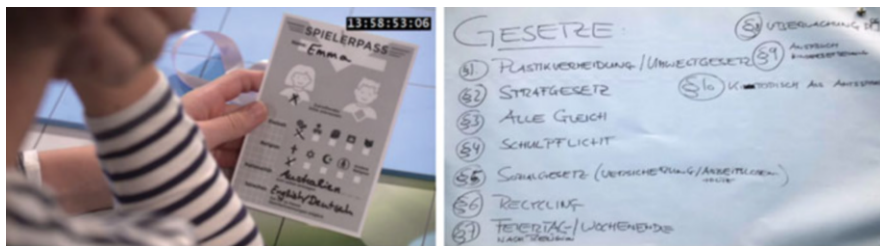


Fig. 6.9 Player passport (left) and example of rules and laws for a city (right)

design a completely different, fictional persona. In both cases, the goal is to make in-game decisions that serve the interests of one's own character/avatar. The players choose their name and gender and one of the four main leisure preferences: sports, nature, culture, or reading. They also decide on a religion (or atheism), nationality, and (one or more) languages to be spoken in their homes. The back of the player's passport provides information about the ethnic and demographic makeup of Germany and the languages most widely spoken therein. However, this is only intended to serve as a guide; the players can opt for a completely different nationality and language. This character aspect of the game and the player passport are important elements in the overall experience and for the embodiment (Fig. 6.9).

All decisions made during the game have an impact on the development of the city. The simulation provides feedback via scales for clearly defined key indicators. The main indicator is "quality of life", but other key areas of life for the inhabitants of the city (health, food, security, environment, prosperity, education, recreation/play/leisure, jobs, and community) should also be developed as much as possible. These nine areas of life represent the most important values and needs of the simulated citizens.

To make the simulation playable, an application that calculates complex relationships and clearly demonstrates their effects was programmed. The children codeveloped the variables and their interconnections, but the software was ultimately programmed by professionals. To ensure that the game realistically models the interactions between investments and decisions pertinent to urban development, experts were interviewed. Players also enact laws and regulations promoting harmonious coexistence and assess their impact on urban development and the lives of citizens (Fig. 6.10).

In the simulation, various dimensions are interconnected. For example, public parks and transportation have a positive effect on the environment, and building schools and universities increases education, etc.; in turn, this leads to growth of the population and tax revenues, which can be reinvested to further develop the city. Important aspects of diversity should be catered for by the infrastructure. For example, players with an interest in sports should be able to find facilities like soccer stadiums and public baths, and players that follow the faith of Islam should be able to find a mosque in the city, etc. When building residential areas and houses to provide living space for the population, players are also required to make decisions about the

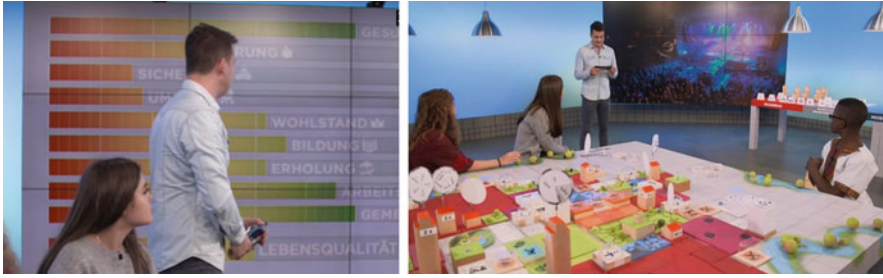


Fig. 6.10 Indicators of quality of life (left) and example of an event situation (right)



Fig. 6.11 Players making infrastructure decisions (left and middle) and decide on diversity characteristics of population within a district (right)

diversity of the simulated population in a given district, taking into account the infrastructure (Fig. 6.11).

The players of KIKATOPIA have considerable freedom to plan urban development. In fact, there is an almost unlimited number of possibilities as to how cities are developed, including building locations, infrastructure investments and the temporal order thereof, and the people moving into new districts. Players need to ensure that tourists feel comfortable and that native and immigrant populations are working together in the community. The needs of the heterogeneous population must be taken into account and balanced. Each group of players makes their own decisions, so there are an unlimited number of ways in which the cities develop from round to round. Furthermore, in each round of play, an unforeseen negative or positive event occurs. In their role as city councillors, players must discuss and decide how to react, implementing new laws and regulations or investing funds. The players must explain their decisions via press statements.

During debriefing, the players evaluate their experiences with the simulation game. Emotions evoked by the gameplay are discussed, experience is reflected upon, and the structures in the game are compared to the real world. In other words, the players are encouraged to transfer what has been learned into reality. Debriefing is done not only at the end of the game but also between rounds.

The simulation game, which is played for an entire day, has several rounds:

- Warm-up and briefing (30 min; teams of 3–4 players are formed).
- Preparation phase (30 min).

- Landscape elements—generate map topography.
- Complete the player pass—set avatar personality.
- Choose a city name.
- Place the town hall.
- Implementation phase (4–5 rounds of play, all following the same basic procedure and lasting 60–70 min).
 - Land partitioning and construction of buildings.
 - Definition of population.
 - Decisions regarding laws.
 - Decisions regarding events.
 - Decisions regarding tourism, if applicable.
 - Simulation of quality of life and tax revenues.
 - Feedback on the simulation results and a short debriefing session for each round.
- Final debriefing (60–90 min).

6.6 Lessons and Ethical Considerations

Feedback from the various stakeholders, viewers of the television show, and, most importantly, the co-design team of sixth grade (aged ~12 years) school peers indicated that allowing children to take responsibility during the design phase is valuable. The children showed competence and the ability to reflect on the topic at hand throughout the design process. They also felt competent and valued. In the game, the players received feedback on their decisions, including when their decisions had negative consequences. Through debriefing, the children developed a profound understanding of the underlying dynamics of the system and devised strategies to cope with the challenges presented by the game.

Involvement in the design of the KIKATOPIA simulation game promoted new perspectives, teamwork, decision-making skills, and awareness of the challenges to harmonious coexistence in a complex world. The self-concept of the children was also enhanced.

It was deemed important to give children as much freedom as possible to express their ideas when designing simulation game. They defined their values and priority life areas, identified places of diversity for field work, created events, defined game roles and rules, and designed materials representing resources. They also defined the main scenario and elements of urban planning, to simulate the challenges posed by an increasingly diverse society (including social conflicts), with the goal of a high quality of life for all citizens. The players were free to implement their own strategies and make their own decisions.

As a final point, we would like to reemphasize that the freedom to explore, design, and play the simulation game is essential from an ethical perspective. The

inclusion of variables such as gender, religion, language, and nationality, which are connected with basic values and needs, and of emotionally challenging events (like terror attacks, refugee influxes, etc.), was important for the realism of the game, but could also be stressful. Thus, we aimed to reduce stress levels by also including some positive and fun events, and we did not explicitly simulate race or skin colour. Although these attributes play an important role in the real world, we did not directly simulate them due to their sensitive nature, which may have caused distress for some participants. However, we explored all aspects of diversity during debriefing.

We also considered it important not to “manipulate” the possible future outcomes, according to the principle that decisions leading to a highly multicultural population are not automatically “better” (and were thus not more rewarded compared to decisions leading to a more monocultural population). In other words, we tried to avoid biasing the simulation towards a particular model of society. The game was designed to provide players with opportunities to develop creative and innovative solutions to the challenges of modern societies and to promote discussion of the advantages and disadvantages of the various possible futures with respect to cohabitation. In that regard, having several teams play, the game simultaneously was important to ensure different perspectives and visions for the future. During play and debriefing, the participants could visit the other simulated cities as tourists and provide feedback as to whether their needs and expectations were met.

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