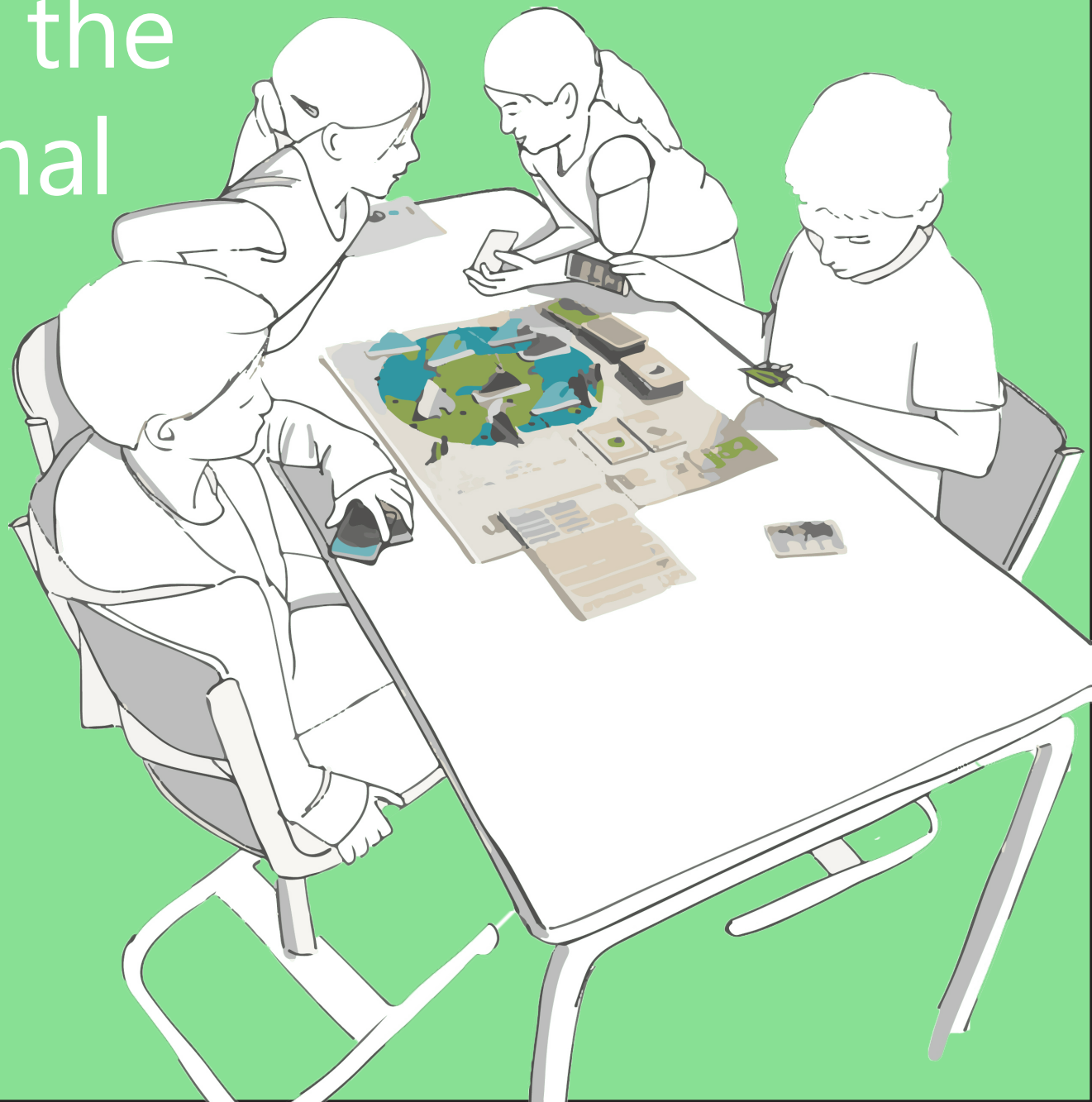
Designing an entertaining game that measures the social/emotional development



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Master thesis
July 2020
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Acknowledgements

I would like to thank my two supervisors from the TU Delft, Mathieu and Niko for their support, feedback and ideas throughout the entire project. I would also like to thank the Lab Rats from the Play Well Lab who I could always ask for feedback or just a chat about the struggles of graduation.

I would like to thank Manja from SWKGroep for her support and resources. From the moment COVID-19 threatened to be a problem, she did everything to make it possible for me to continue. She also put me in contact with the next two people I would like to thank, two experts from SWKGroep, Ilse and Hinke. They helped me throughout the entire project with new ideas and knowledge, and always wanted to help me, even if they did not know the solution yet.

I would like to thank my test subjects, the 24 children from groep 3/4 from primary school De Dolfijn in Haarlem for always being excited to help me and improve my game.

I would like to thank my family and friends for mentally supporting me through this process. They have always believed in me, at the highs and the lows.

Summary

In order to support the development of children, they are continuously monitored at all types of care they go to. The goal of SWKGroep is to improve this support of the development. In order to do this, and enrich their portfolio, they want to know the possibilities of measuring the development with the use of a physical game.

This report describes the design process of this game and the research to the possibilities of implementing the measurement in this game. Research, interviews and observations have shown that the social and emotional development domain at 6-8 year old children shows the most potential for a development measuring game, both because of the large changes in this domain for this age and the fit with the values of SWKGroep.

In current monitoring systems for the social and emotional development, supervisors observe children and score them on a list of statements. However, the supervisors do not always have time to monitor each child individually. Because of the role of the supervisor, this can also create subjective outcomes. Therefore, it is concluded that the game must measure independently.

By combining two current social and emotional measurement systems, a full understanding of the social and emotional spectrum was created. With this, a list of 23 categories was setup which the game must include to measure.

By performing brainstorm sessions, current game analyses and collaborating with experts, a variety of game ideas have been created. After testing, improving and combining those, three concepts were created. By testing these with the target group, the most promising concept was selected.

After this, through a process of testing with the target group and iteration, the game was improved to be an entertaining and understandable game. In the game, teQ's adventure, the players have to work together and execute assignments. Each assignment requires skill points, which each player has assigned to himself, to fit him best. The game can both be played on a board as in a 'life size' version.

After the entertainment level and understandability were confirmed, the focus shifted to the measurement. Throughout the entire design process, the 23 social and emotional categories were taken into account, but could now be improved further. The categories are implemented in the assignments. The decisions that the players make and the answers that they give to questions, create the data for the measurement. During the game, the players use an app to log their process and insert their answer and decisions. These are then used to transfer into measurement scores. The supervisor can now process them in the same way they do with the current system.

After the design of the game was completed, the game was evaluated. Because in the game the data is collected in a consistent way, through the app, the results have a high reliability. However, because this way of measuring is new and the implementations were created by a non pedagogical expert, the validity has to be assured through further research.

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1. Assignment

This report describes the design process of a game for children at afterschool care and the research to the possibility of measuring the social/emotional development with the game. The assignment is executed for the Play Well Lab of the TU Delft, in cooperation with SWKGroep.

In 2018, more than a third of the children between 4 and 12 years old received afterschool care in The Netherlands (Centraal Bureau van Statistiek, 2019a). With over 250 locations and 25.000 children, SWKGroep has a big share in this sector, especially in Zuid-Holland. Besides afterschool care, the SWKGroep Foundation provides all varieties of child care, extra care for children with special needs, education and community work from eleven sub-organizations.

In order to keep growing and distinguishing themselves from other companies, they have to keep innovating.

Vision

The vision of SWKGroep for children is to let them develop optimally. Their pedagogical vision is to accomplish this by decreasing the fault lines of the life of the children, by providing as much closely working together support as possible, like the afterschool care. In the future, SWKGroep wants to be able to shape the development of the children even more.

The keywords of SWKGroep are innovative, cost efficient, social, quality and teamwork (both with employees as with children).

Figure 1.a Logo of SWKGroep

Portfolio gap

In order to keep innovating, SWKGroep has a broad range of products in their portfolio; besides offering child care, community work, education and support, they organize events, like the Playground at the World Harbour Days in Rotterdam, they partner with organizations, like the Special Olympics, and they publish activity books around their yearthemes.
However, this portfolio does not fit the future vision of SWKGroep to be able to shape the development of the children, as can be seen in figure b. In this figure, all products are placed on a scale of how much it supports SWKGroep to be able to improve the development and two of their keywords; innovative and involvement of the children. For more details about the numbers, see appendix B.

Based on this portfolio analysis, it becomes clear that at this moment, shaping the development even more is only a vision for the future.

Project aim

Therefore, it is a logical move of SWKGroep to ask for a new product that fits their future vision; an entertaining, physical game for the children at afterschool care, in which the yeartheme is incorporated, that also measures the development of the children.
However, since it is not known to what extent it is possible to make an entertaining game that also measures the development, the following assignment was set up:

Design, prototype and test an entertaining, physical game for SWKGroep that will be used at their afterschool care locations, and explore how and to what extent it is possible to measure the development of the children with the use of the game.

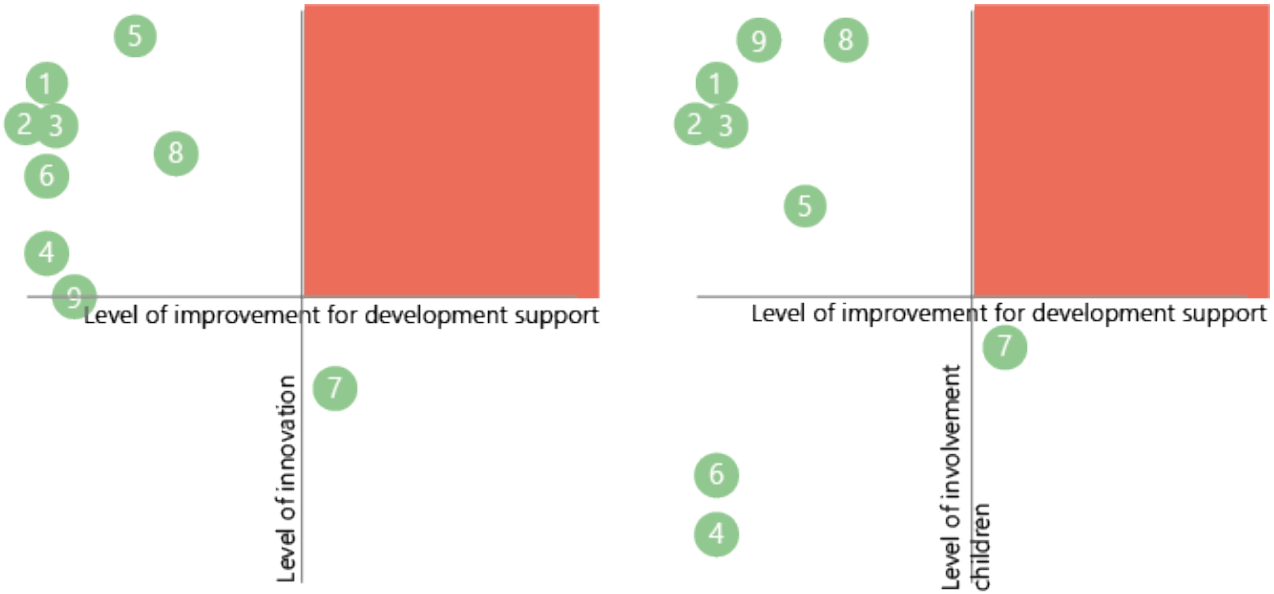


Figure 1.b All products/events' level of improvement for development support compared to level of innovation and level of children involvement.

2. Analysis

Before the designing, prototyping and testing could start, an analysis had to be executed. This answers the following sub research questions through literature and field research:

1. *What context factors of the afterschool care influence the (design of the) game?*
2. *What age group shows the most potential for the measurement of their development in a game?*
3. *What developmental domain shows the most potential to be measured with a game for the chosen age group and how to measure this?*
4. *How to design a game and what do games consist of?*

2.1 Context

The first paragraph describe the context of the afterschool care in two parts: (1) An afterschool care location and (2) Pedagogical employee at the afterschool care. After these, a conclusion is drawn to answer the first sub-question:
1. What context factors of the afterschool care influence the (design of the) game?

2.1.1 Afterschool care location

SWKGroep offers child care to children at 250 locations. For this project, one location is chosen as a model location. This location is Didjeridoe in Hillegersberg, Rotterdam, from suborganization BijDeHand. Didjeridoe offers afterschool care to approximately 130 children from 4-12 years old. The children are divided over 5 groups. Each group has 10-30 children, with one pedagogical employee per 10 children. They are based in two buildings with a large playground in between. Next to the location is a primary school. The children also often use the schools playground or gym to play. 95% of the children go to the primary school next door.

Based in the main building:

Groupname	*Age*	*Children*	*Pedagogical employees*
Walibi's	4-5	20	2
		10	1
Skippy's	6-7	20	2
		10	1
Kakadu	7+	30	3

Based in the side building:

Groupname	*Age*	*Children*	*Pedagogical employees*
Kangoeroes	7+	20	2
Wombats	7+	20	2

Each group has a room (approximately 10x8m) with games, toys and crafting supplies. Examples of games are Monopoly (multiple versions), Halli Galli, Stratego, educational card games and many puzzles. Children are free to pick and take games themselves out of the cabinet.

Figure 2.a BSO Didjeridoe

Yeartheme

As mentioned before, SWKGroep has a new yeartheme each year. This theme is then used for the activity book and big events. The activities during the holidays also revolve around the yeartheme.
Besides the yeartheme, SWKGroep has a mascot; teQ. teQ is a robot from planet esweekA, where everyone has a collective memory and everything is backwards, hence the spelling. teQ now lives on Earth and wants to learn as much as possible about the way humans live.

2.1.2 Pedagogical employee

Persona

On the next page, a fictional persona can be found of a pedagogical employee. This persona is a visual summary of her interests and opinions, which are based on interviews with three pedagogical employees at Didjeridoe.

These interviews made clear that the pedagogical employees do feel comfortable and able to observe the development of the children with the available tools. However, they do not feel like there is enough time to do this. This results in the requirement for the game to be able to measure the development without the pedagogical employee.

A day in the life

A visualization of an average day at afterschool care location Didjeridoe for both the pedagogical employee and a child can be found on page 16.

The activities that the pedagogical employees facilitate are devised during monthly meetings of pedagogical employees. The children however are free to decide whether they want to participate in the activity or if they want to play for themselves.

This average day applies to 39 weeks of the year. The other 13 weeks are holidays. This means that in these weeks, the children are at the afterschool care for the entire day. A visualization of this day can also be found on page page 16, in the upper right corner.

The activities during holidays are arranged by the activity coordinator and are shaped around the yeartheme. During school weeks, the pedagogical employees say that they do not have enough time/resources to actively create activities around the yeartheme on a regular basis. This reinforces the wish of SWKGroep to include the yeartheme in the game.

2.1.3 Conclusion

1. What does the context of the afterschool care mean for the game?

The context of the afterschool care comes with some restrictions as the time and space at the location is limited. However, it also serves opportunities: using the year theme and the availability of a big group of children.

Since the pedagogical employees have shared that they do not have enough time to observe each child, the game must measure the development without the help of the pedagogical employees.

Requirements

- The game must measure the development without actions of the pedagogical employee.
- The game must be playable in a space of 8x6 m to fit inside.
- The yeartheme must be incorporated in the game.
- The game must be adjustable to a new yeartheme every year.

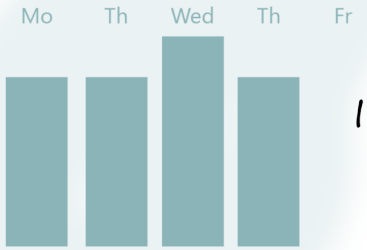
Laura Gruijs

28 years old

pedagogical employee at Didjeridoe

"The thing I love most about my job is seeing the children develop."

"I wish to have more time to observe the development of the children"



I work four days a week on group Kakadu

Figure 2.b Persona pedagogical employee

2.2 Children

2. What age group shows the most potential for the measurement of their development in a game?
As mentioned before, SWKGroep offers child care to children from 0-12 years old. However, it is not possible to design a game that is entertaining and challenging for this entire age group. Therefore, this paragraph explains which age group is the most interesting to create an development measuring game for.

Age group

Before a decision could be made, different statements had to be taken into account:

0-4 year olds are constantly monitored
The development of the youngest group of children, 0-4 years old, are almost continuously under supervision of the youth healthcare system (JGZ). Additionally, there is a lot of knowledge available about this age group. This makes it less interesting to design a product for this age group since it is less likely to add something for them.

10-12 year olds are the minority at afterschool care
Out of the 8900 children that go to afterschool care at SWKGroep, the smallest age group is 10-12 years, with 1000 children. The reason for this is that these children are more independent and most parents are likely to feel comfortable with their children being home alone. Furthermore, children of this age differ a lot in their personalities and interests. With this information, one could conclude that creating a development measuring game would be beneficial, because of the extra information that is gained. However, because the main goal of the game is to be fun for the children, is it expected that this is too difficult with the lack of information available. Additionally shows this age group less of potential because they will stop coming to afterschool care soon. This makes it less beneficial to monitor them.

7 years old is a pivotal age in terms of development
At the age of 7 years old, a lot happens for a child on developmental levels, making it a so-called 'hinge age' (Dutch: scharnierleeftijd). (Delfos, 2020) This makes the age group of 6-8 years old interesting to monitor in order to see which children develop early and which children are a bit behind schedule. Because this age group is not independent enough to stay at home by themselves, a lot of children of this age, namely 4040 (as of march 2020), make use of afterschool care at SWKGroep, which means that a lot of children would benefit from a game. Which specific developmental domain shows the most potential is discussed in the next paragraph.

Taking into account these statements, a logical conclusion is to choose the age of 6-8 years old as a target group.
Normally, SWKGroep bases children in groups of 4 years (0-4, 4-8, 8-12 years old). However, they agree that 4 year old and 8 year old children differ too much to design one game for.

Persona

On the next page, a fictional persona can be found of a 7 year old girl. Her personality and interests are based on observing and talking to children at afterschool care location Didjeridoe.

The observations and talks made clear that the children at afterschool care just want to play and have fun with their friends. Because most of the children go to the same school, they play with the same children in small groups (2-6 children) almost all the time. When playing games, the competition is not a priority for them, although cheating seems to be tempting. Because of their short attention span (10 minutes for unwanted activities (Menselijk Lichaam, 2017)) waiting can be difficult.

A day in the life

A visualization of an average day at afterschool care location Didjeridoe for both the pedagogical employee and a child can be found on page 16.

2.2.1 Conclusion

2. What age group shows the most potential for the measurement of their development in a game?

Both from crossing out age groups and researching interesting ages of children, the age group of 6-8 years old shows the most potential for an entertaining, development measuring game.
Children of 6-8 years old mostly stick with what they know (friends, game, daily routine).

Requirements

- The game must be designed for 6-8 year old children
- The game must be playable in small groups (2-5 children)
- Winning does not have to be the main game goal
- The players must not have to wait long for their turn
- The game must be fun and attractive

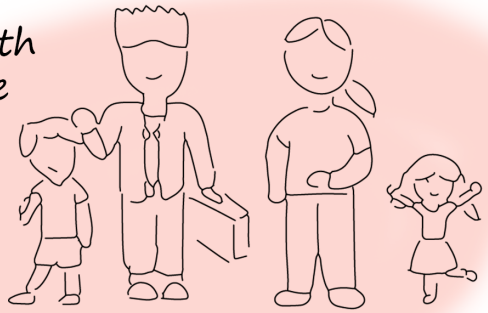
Emma Grootjes

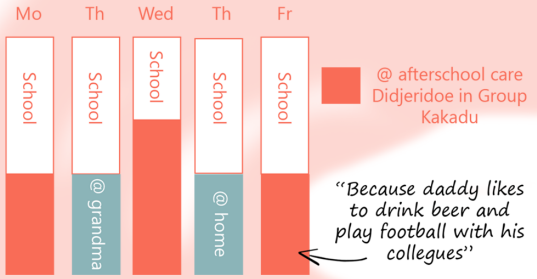
7 years old

goes to groep 4 of
the St. Michaëlschool

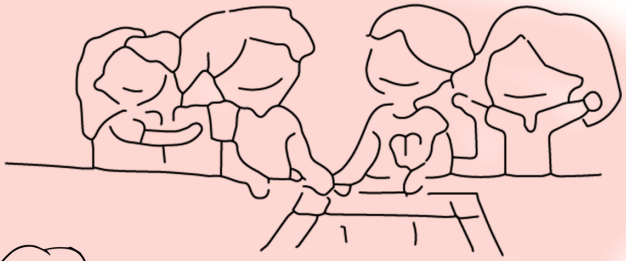
"You don't learn at afterschool care, you play!"

I live in Rotterdam with my parents and little sister Sophie.





This is me and my best friends, we always play together. We like to...



play Monopoly,

make slime,

and play ball outside!

Figure 2.c Persona child

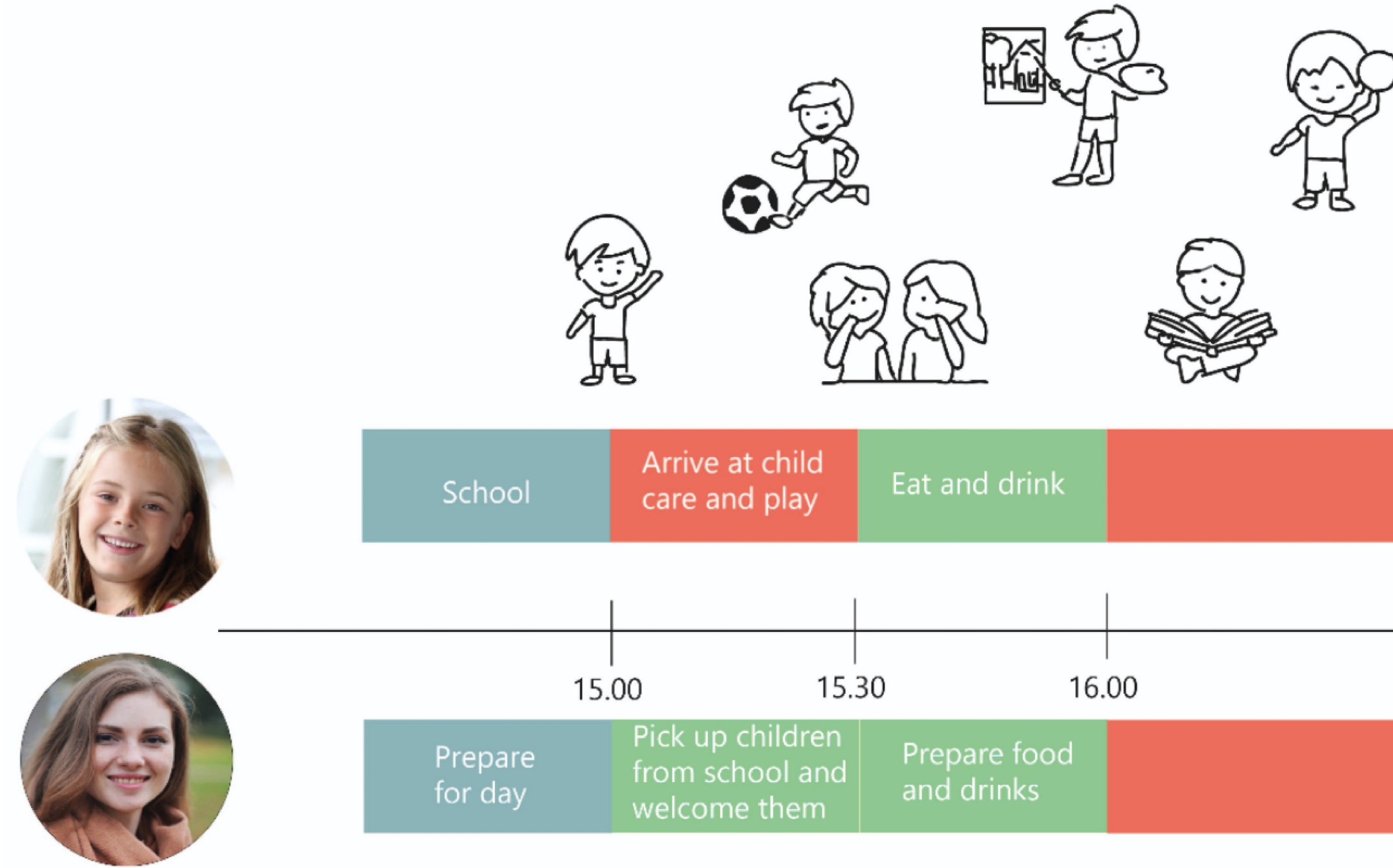


Figure 2.d A day on the afterschool care

A day at afterschool care during vacation

2.3 Development

3. What developmental domain shows the most potential to be measured with a game for the chosen age group and how to measure this?

The development of children is mostly separated into four different domains. However, it is not possible to design a game that is entertaining and measures all of the developmental domains.
Therefore, in this paragraph I explore the four domains and make a choice for the one that shows the most potential to measure and to be able to shape more in the future. The next paragraph then researches the possibilities of measuring this development domain.

2.3.1 Domains

The development of children can be divided into different domains. Because there is a fine line between the domains, different domains are used throughout literature.
Four often used domains are motor (fine and gross), cognition, social & emotional and speech & language. (Pollard & Lee, 2003; Fraser-Thill, 2019; Noorderpoort, n.d.). Tamis-Lemonda et al. (2002) even speaks of 'play' as a domain, however, upon further research, all domain specifics where part of at least one of the four 'main' domains. Therefore, in this research, the focus lies on the four initial domains.

Motor

Motor
[motor]: Giving, imparting, or producing motion or action (OUP, 2019)

Motor skills can be divided into two skills: gross and fine.

Gross
Gross motor is the movement of the entire body or large parts of the body and the stabilisation of the body.

Six to eight years old
A 6 years old child is expected to be able to run, balance himself on a beam, use a skipping rope and throw and catch a small ball. After 6 years old, the skills develop further and get more refined, but not much new skills are learned.

Fine
Fine motor is the movement of smaller parts of the body, like hands, fingers, feet and eyes.

Six to eight years old
From 6-7 years old, children learn how to write at primary school. This will be refined up to 8 years old. Children at this age are also able to build with smaller objects like LEGO and tie their shoes.

Figure 2.e Children using gross and fine motor skills

Cognition

[cognition]: The mental action or process of acquiring knowledge and understanding through thought, experience and the senses. (OUP, 2019)

Six to eight years old

A lot happens on the cognitive spectrum with children of this age. Piaget (1972) states that at this age, children get a better understanding of the world around them and are thus more able of abstractions (Delfos, 2020)
From the age of 5 and forward, children also learn to be less egocentric. (Piaget, 1972)

Figure 2.f Child using his congitive skills

Figure 2.g Children being social

Social/emotional

[social]: Needing companionship and therefore best suited to living in communities. (OUP, 2019)
[emotional]: A natural instinctive state of mind deriving from one's circumstances, mood, or relationships with others. (OUP, 2019)

Six to eight years old

On the social and emotional level, many things change for children from six to eight years old. The main cause for this is the expanding social network because of school, child care and after school activities. The child experiences that he/she cannot always rely on an adult and starts making friends. (Delfos, 2020) During the expansion, children learn to deal with their emotions better and are not independent enough to not care about what others think of him/her, especially adults. Children also get a better understanding of rules in games and winning, losing and cheating. (Raising children, 2020)

Speech/language

[speech]: The expression of, or the ability to express thoughts and feelings by articulate sounds. (OUP, 2019)
[language]: The method of human communication, either spoken or written, consisting of the use of words in a structured and conventional way. (OUP, 2019)

Six to eight years old

At this age, children are almost finished developing their speech skill. At eight years old, they are expected to be able to make all the speech sounds that their language contains.
On the language level, their vocabulary is still expanding but their grammar should be mature. They are also able to discuss opinions and use and understand sarcasm. Their attention span to listen to a speaker also improves. (Kid Sense, 2017)

Figure 2.h Children using their speaking skills

Choice

SWKGroep has a strong wish to contribute to the development of children and to be able to shape this even better in the future. In order to make a big contribution, the domain with the most potential must be chosen.
SWKGroep shows great value to teamwork and to be social. They also want the children to develop to their optimum, but not only in the subjects taught at primary school, where cognition and speech/language are of great importance. Together with the fact that children of 6-8 are almost completely finished with the development of their motor skills, the most logical choice is to focus on social/emotional development of the children.

2.3.2 Measuring the development

In order to be able to measure the social/emotional development in the game, one must know what aspects constitute the social/emotional development and how to measure them. Therefore, two current measurement tools for the social/emotional development are analyzed.

KIJK!

The KIJK! method (Bazalt) is a tool that is used by over 30.500 teachers and pedagogical employees (Bazalt, n.d.), including the afterschool care of SWKGroep. The method is used twice a year by the teacher or pedagogical employee by filling out questions about each child individually. The questions can be answered with +, +/- and -. These results are then used to discuss with the parents and decide on further actions if necessary.
KIJK! divides social/emotional behaviour into thirteen elements:

- Emotional barriers
- Curiosity and entrepreneurial
- Confidence
- Independance
- Teamplayer
- Standing up for themselves
- Contact with pedagogical employees
- Contact with other children
- Taking others into account
- Dealing with conflicts
- Involved in the group
- Dealing with authority
- Respect to others

SEOS

SEOS (Gielen, 2010) is a method that is used in the care for mentally disabled people. It was created to be an improvement of two not officially approved current tools, SEO (Došen, 2005) and (ESSEON-R) (Hoekman et al., 2007) however, whether SEOS is approved is not known.

The goal of SEOS is to determine the mental age of the client and then be able to interact with the client in a suiting way. The method is used by answering yes/no questions. This is regularly done by caretakers, close family and, if possible, together with the client.
SEOS is meant for people with a mental age of 0 - 12 years old and measures in five domains:

- Ego-development
- Social development
- Emotional development
- Affect differentiation
- Moral development

With the answers, it is determined in which of the five age groups of Došen (2005) the client belongs:

- Adaptation phase (0-6 months)
- First socialization phase (6-18 months)
- First individuation phase (18-36 months)
- Identification phase (3-7 years)
- Reality awareness phase (7-12 years)

Combining the methods

In order to create a full image of all aspects of social/emotional development, the two methods are combined. In this, KIJK! is fully used and for SEOS, only the two final phases are used to fit the target age group.
When comparing the two methods, it becomes clear that the thirteen groups of KIJK! can all be implemented in the five domains of SEOS. In order to do this, all questions/statements of one domain of SEOS are combined with the matching groups of KIJK! and then divided into subcategories and subsubcategories in the five categories of SEOS. The five categories and its subcategories are:

- Ego development
  - Independence
  - Self confidence
- Social development
  - Interaction with others
  - Dealing with authority
  - Interest in others
  - Taking others into account
- Emotion regulation
  - Dealing with conflicts
  - Keeping things with yourself
- Affect differentiation
  - Insecurity
  - Resisting
- Moral development
  - Right and wrong from your own point of view
  - Right and wrong for others
  - Abiding rules

For an explanation per subcategory and the corresponding subsubcategories, please see appendix C.

Affect differentiation

Affect differentiation means emotion regulation or emotion differentiation. However, as SEOS uses it, the domain is about aggression regulation. In SEO (on which SEOS is based) the initial domain affect differentiation is renamed to emotion differentiation and there is a separate domain for aggression regulation. (Riské, 2014)

When looking into KIJK!, there is no domain about aggression regulation. Consultation with the Pedagogical Expertise Center (PEC) of SWKGroep made clear that this is because KIJK! only focuses on the 'regular' development of children, in which aggression is not a true issue. Children at afterschool care do experience aggression, but not in the same degree as people with a mental disability, for which methods as SEOS and SEO are created. Aggression is monitored with 'regular' children, but when the behaviour of these children is too challenging or requires extra attention, these children are transferred to special care.

Since the designed game from this research is focussed on 'regular' care, it can be concluded that the 'affect differentiation' domain as described by SEOS, or the 'aggression regulation' domain from SEO are not relevant and can be removed from the list. Furthermore, since there still is an 'emotion regulation' domain, this part of the domain is still covered, since this is important for every type of care.

Way of measuring

Both current systems make use of a checklist. On this checklist, a supervisor 'checks' different statements with +, - or +/-.
Although in paragraph 2.1.2 the requirement that the measurement in the game must not require help of the pedagogical employee was set, this checklist system can still be used. Instead of a person checking the list, the game must check the list based on the actions of the players.

Ranking the elements

In order to get a full understanding of someone's social/emotional development, all (sub)categories must be measured in the best way possible. However, because of the large amount of (sub)categories and big difference in the categories, further research must show whether it is possible to include all (sub)categories to the fullest extent in the game.

In order to still gain the most from the measurement of the development, the importance of each category was researched. In this research, the importance for the age group as well as the best fit with the afterschool care and SWKGroep are taken into account.

Age group

In order to answer this question, a pedagogical policy officer of SWKGroep was consulted. She however says that for this age group, all categories show equal relevance since the children are still fully developing.

Afterschool care/ SWKGroep

When looking purely at the vision and best fit with SWKGroep, together with the innovation manager and a pedagogical policy officer, it was determined that the social development shows the best fit and biggest relevance for SWKGroep. Next are moral development and emotion regulation (shared second place) and the fourth place for ego development.

Conclusion

It is difficult to place one social/emotional category before the other when it comes to relevance, because they are all required for the full understanding. Social development does however show a clear important fit with SWKGroep. Therefore, it can be concluded that the social development is the most important to measure, but all categories must be taken into account.

2.3.3 Conclusion

3. What developmental domain shows the most potential to be measured with a game for the chosen age group and how to measure this?

Both from the keywords and vision of SWKGroep and the combination with the age group, the social/emotional development domain shows the most potential for the game.
By combining two current available social/emotional measurement methods, a full overview of the segments of the social/emotional development was created. This overview can then be used as a checklist to see if the designed game can measure the complete social/emotional development. However, it can be concluded that affect differentiation - or aggression regulation - is not relevant for the context and can therefore be excluded from the game.

Requirements

- The game must measure the social/emotional development as much as possible.
- The game must measure the social development to the fullest extent.
- The game must meaure the moral development, emotion regulation and ego development as much as possible.

2.4 Game design

4. How to design a game and what do games consist of?
Quite a lot of literature is available about game design, however only some show a clear step to step approach to game design. One of those is the Persuasive Game Design method of Siriaraya et al. (2018). They have created a 'cookbook' for persuasive game design. The game in this project will not be a persuasive game. Although certain behaviour must be stimulated with the game, this is not stimulated to change behaviour, but just to measure. The behaviour is thus not actually stimulated, but more triggered.

In this phase of the process, their third dish (step) comes at hand. The previous dishes were not used because these steps were already executed. In Dish 3.1 the main decisions about the game, like player actions, are made. These main decisions can be picked from game elements and used in different combinations to create different games. Before this could be executed, a full overview of the options had to be created.

This is done in two ways; generic game elements and project specific game elements.

2.4.1 Generic game elements

Two types of general game elements can be determined.
On the one hand, there are game mechanic type of elements that are required for a game experience, like goal and the relation between the players. These elements are always present since they create the general outline of the game and can therefore also be used to create an overview of game options.

On the other hand, there are 'optional' game elements, which relate more to the game theme, like challenge or sensation. Wang (2019) has created a list of these game elements. These type of elements are more suitable for inspiration since not every one of them is required in a game.

Since the first type of elements are always present, they can help create the game. The game element list of Järvinen (2008) was used as a basis for this. Some of his elements were removed or used in a slightly different way since some were too specific or irrelevant for this overview.
Järvinen's used game elements are:

- Components
- Players
- Environment
- Goal
- Game mechanics

Game analysis

In order to create the full overview per game element, an analysis of ten popular games was executed. These games were chosen based on

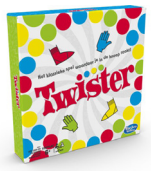
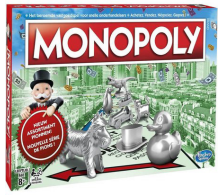
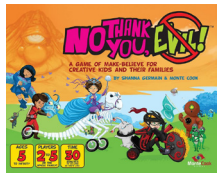
- Presence at Didjeridoe
- Presence in primary school classes
- Most sold games on bol.com
- Type of games (e.g. board games, role playing, puzzles) (Spacey, 2019)

Before the analysis was executed, I made sure that I understood the rules and gameplay of each game by watching explanation videos online and/or having played the game before.

The games

The games that are used in the analysis and their type, can be found in the table below.

Table 1. Analyzed games

Qwixx	*Hanabi*	*Uno*	*Twister*
Dice game	Card game	Card game	Active game
			
Rush hour	*Monopoly*	*Concept Kids*	*No thank you, evil!*
Puzzle	Board game	Board game	Role Playing
			
Whispering game	*Tic tac toe*		
Conversation game	Paper based game		
			

The elements

With this analysis, a lot of 'options' per game element are known. Although it is expected that the 10 analyzed game do not contain all possible options, it does create an extensive overview. These options can now be used in the ideation of games as an inspiration.

Two examples of results from the analysis can be found in the table below. The full analysis can be found in appendix D.

Table 2. Examples of game analysis

	Monopoly	**No thank you, evil!**
Components	Characters, dices, tokens	Board, tokens, book
Environment	Board	Role Playing
Goals	Survive	Achieve assignment
Game mechanics	Roll dices, move, place	Roll dice, decide on action
Players	Everyone separate	All vs game

2.4.2 Project specific game elements

In paragraph 2.3.2, the categories of social/emotional development were determined. In order to be able to measure these categories, they have to be present/triggered in the game.
As a tool for inspiration to incorporate these categories, the ten games from the previous analysis were used to see if and how the categories are incorporated in current populair games.

The results

In the table below, for every domain and subcategory, a summary about the presence of that subcategory in the analyzed games can be found. For the full analysis per game, see appendix E.

Table 3. Summaries of presence of subcategories in analyzed games

Domain	Subcategory	Presence in games
Ego development	Independence	Independence is a frequent element in games, however, the order or actions is almost always fixed. Therefore, initiative is the form of when take action is not frequent, but it is in the form of what to action to take. Only a few games offer a form of problem solving, which is then mostly the core of the game.
	Self confidence	Since most games revolve around luck, it does not matter how confident a player is for his success. Some games offer difficulty levels and teamwork, but this could be improved.
Social development	Interaction with others	In cooperative games, player unsurprisingly are stimulated to work together since their success is based on it. This is therefore great inspiration. On the other hand, competitive games also require some interaction, mostly in the form of trading or negotiating.
	Dealing with authority	Only in one game players have to deal with authority, as a gameleader/host. Since this host has a big influence on the game, it is important for the players to deal with him in a desired way.
	Interest in others	Even though games are seen as bonding material, most games do not influence any sharing of how they are doing, even most cooperative games.
	Taking others into account	The way that players can take into account other players is in the difficulty of the play, or in how harsh they treat each other, however, this can be done in almost every game.
Emotion regulation	Dealing with conflicts	Since games are created to have fun, it is not ordinary to include conflict in the gameplay, which is also the result of the analysis of these ten games. Every game can ofcourse cause conflict, however, this is not directly part of the game but more part of the relationship and personalities of the players.
	Keeping things with yourself	The games show that in most games, all information that is known, is shared by all players and therefore no information/emotions must be kept for the players themselves.
Moral development	Right and wrong from your own point of view	In almost every game, it is possible to cheat or to abide the rules. However, since it is expected from the players to not do this - otherwise the game might lose its purpose of creating a fun moment - no game offers a way to deal with this. Brainstorming about this topic will have to show if it is possible to implement this in a game and still keep it fun.
	Right and wrong for others	
	Abiding rules	

2.4.3 Conclusion

4. How to design a game and what do games consist of?

In order to design a game, the main game structure has to be created. Therefore, an overview of all elements and options was created and can now be used as inspiration in the design process.
This analysis could then also be used as an inspiration tool to check whether current games already contain the required social/emotional development categories.
This latter analysis showed that independence and interaction with others are common social/emotional categories in games but most other categories are only present in a few games. This creates a basis for the ideation that has to be done in the next phase.
Furthermore must brainstorming show whether it is possible to provide the moral development elements in a game that is also fun.

2.5 Overall conclusion

In the previous paragraphs the analysis phase of the following design assignment was described.

Design, prototype and test an entertaining, physical game for SWKGroep that will be used at their afterschool care locations, and explore how and to what extent it is possible to measure the development of the children with the use of the game.

This analysis has created a list of requirements for the game which can be found in appendix F. The five most important requirements are:

1. The game must be created for the target group of 6-8 year old children

The analysis of children between 0-12 years old has shown that children between 6-8 years old develop a lot and are therefore the most interesting age group to work with.

2. The game must measure as many of the social/emotional categories as possible, with the social development having the highest priority.

Following the analysis of the age groups, shows that the social/emotional development has the most potential for an addition to the measurement. When looking more into detail, the social development shows the biggest relevance for the game to measure because of the fit with SWKGroep. However, other categories must try to be present as much as possible.

3. The game must measure the development without help of the pedagogical employee

Since the pedagogical employees already have tools to measure the social/emotional development of the children but simply do not have time for this, it is required that the game also does not require extra time.

4. The game must fit the context of the afterschool care of SWKGroep

In order for the game to be playable at the afterschool care, it must fit the context, like the available time and space. For this, SWKGroep location Didjeridoe will be used as a reference.

5. The yeartheme of SWKGroep must be incorporated in the game

SWKGroep launches a new yeartheme every year. This theme can be used for activities and events. However, the themes are not actively used in daily activities at the afterschool care because of lack of time. Therefore, the game must incorporate it to make use of the yeartheme even more.

3. Ideation

In this chapter, the ideation phase is described. Different tools and methods are used for inspiration and to come up with different ideas, which are then tested and improved.

3.1 Ideation

3.1.1 Morphological chart

In order to create game ideas that include the five game elements from paragraph 2.4.1 and the social/emotional subcategories from paragraph 2.3.2, a morphological chart was made, as can be found in appendix G. The morphological chart was used to assure a wide variety of games. With the help of fellow students and family members, a total of eight game ideas were created.

Two of the eight ideas can be found below, the others can be found in appendix H.

Idea 2. King attack

Game type	Board game
Goal	Reach the end of the board
Players	Everyone separate, option for teamplay
Actions	Play cards, answer questions, roll dice
End of game	Player has reached the end

Explanation
One player is the king, the other players are the knights. The goal of the knights is to take over the throne of the king, the goal of the king is to stop the knights from doing this.
Each round, a knight answers a question from the king. If the answer is correct, the knight takes a step forward, if the answer is wrong, the knight takes a step backward. After this, the knights can attack eachother by asking questions to take astep forward or backward. Knights can also form alliances for a round, but the knights need to be careful, since a fake alliance can also be formed.

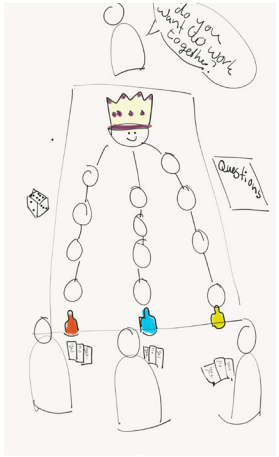


Figure 3.a Idea 2.

Idea 3. Jungle rescue

Game type	Active/roleplaying game
Goal	Fulfill the assignment
Players	All against the game
Actions	Move (player)
End of game	Time is up

Explanation
Each child gets/creates a character, based on their own preferences. This character defines what a child can and can not do. The children then spread out over a set up field and the pedagogical employee tells the chosen story from the storybook. In the story, the characters follow a story in which they have to do assignments, which the children have to do. Each assignment has a location on the playing field and characters required. After getting to the location as soon as possible in the way that the characters can move, the assignment has to be executed. If the children succeed, they get a point (like a saved animal) and the story continues. They can also ask for help from other players. If they don't succeed, the story also continues, but it does influence the story. If the story is ended and the complete assignment (like save 10 animals) is succeeded within the set time, the children win.

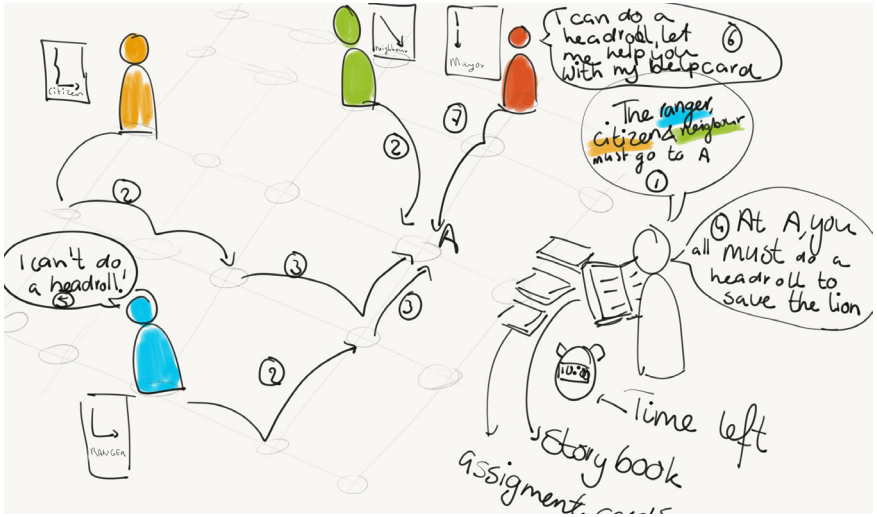


Figure 3.b Idea 3.

3.2 Testing ideas

After the eight ideas were created, adjusted and formed into full games where necessary, the ideas were tested with friends and family by playing the games. In addition to the ideas, an existing game from the game analysis in paragraph 2.4 was played; No Thank You, Evil!. This game showed great potential for the social/emotional elements and was very close to idea 4.

The main goal of the testing was to find out if the games are complete, if the rules make sense and if they are fun. Additionally, the possibilities for social/emotional interactions where dicussed for each game.

The full results of the testing sessions be found in appendix I, the conclusions of the testing can be found below.

Game elements that have a positive effect on the gameplay

- Individual tasks - this keep the players motivated and stimulates having contact between the players
- Playing simultaneously keep the players engaged
- (Having an option to) Work together - this stimulates contact between the players
- Having the option to counteract each other for your own benefit - this keeps the players motivated since their actions have real consequences
- Everyone is active in everyone's turn, to keep all players engaged
- A different gameplay everytime the game is played, to keep the game entertaining when played multiple times
- A large amount of player actions in a game create more options for social/emotional elements
- Having a big influence on the gameplay by making choices for the gameplay and for yourself
- Characters with unique traits, to stimulate the players
- Acting out things
- Discuss opinions
- Tactics required in a game, instead of luck
- Having to take initiative in the game
- Physically building things

Findings to watch out for

- The age group might not feel comfortable with some actions (discussing opinions, acting out words)
- A game should not require a long preparation time before the game can be played.
- Not all players get as engaged in a story/game as others, this must not bother the gameplay
- Games must feel whole, not like put together things
- A game must be playable by only children, no adult gameleader must be required
- A game in which players can play without any interaction with eachother can make it difficult to measure some social/emotional elements.

3.3 Enhancing the social/emotional element

In paragraph 2.3.2 was determined that as many of the four categories (eleven subcategories, and 23 subsubcategories) of the social/emotional development must be present in the game. Next, in paragraph 2.4.2, it was analyzed that in ten popular games, only two of the subcategories were common in games.

The focus of the ideas and the testing was mainly the gameplay and entertainment level. However, the social/emotional categories must also be present in the games. In order to get more ideas per category on how to implement these, a brainstormsession with How to's was executed. In this brainstorm, for every subsubcategory, the situations in which this behaviour can be present and reasons for the behaviour were written down.

These wordwebs could then be used as a source of inspiration for the enhancement of the ideas, and later on for the chosen concept.

Two examples can be found in Figure 3.d and Figure 3.c, the others can be found in appendix J.

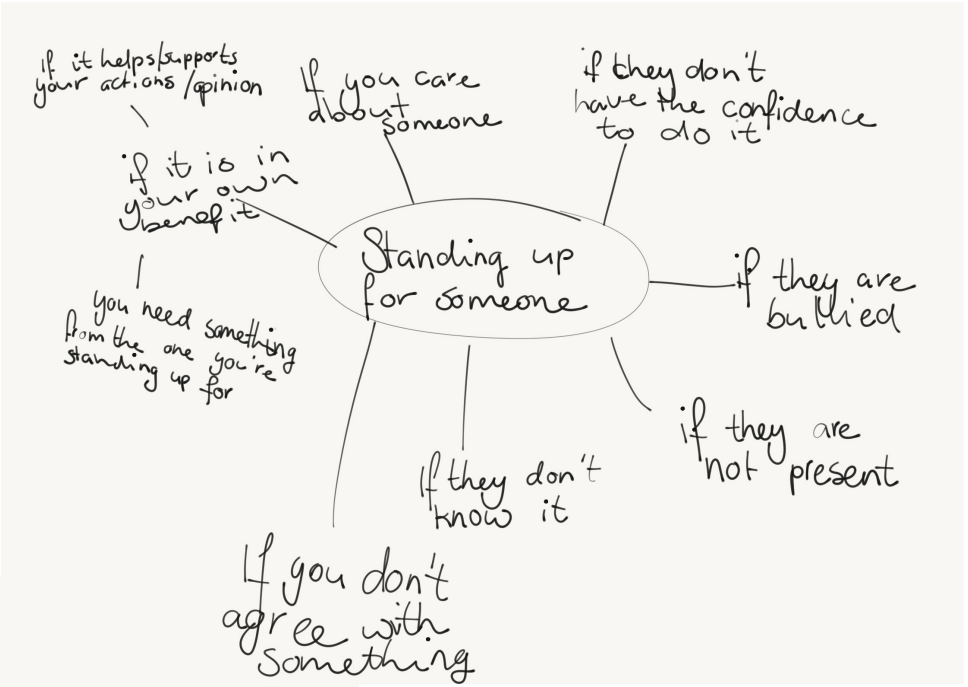


Figure 3.d Wordweb of 'Standing up for someone'

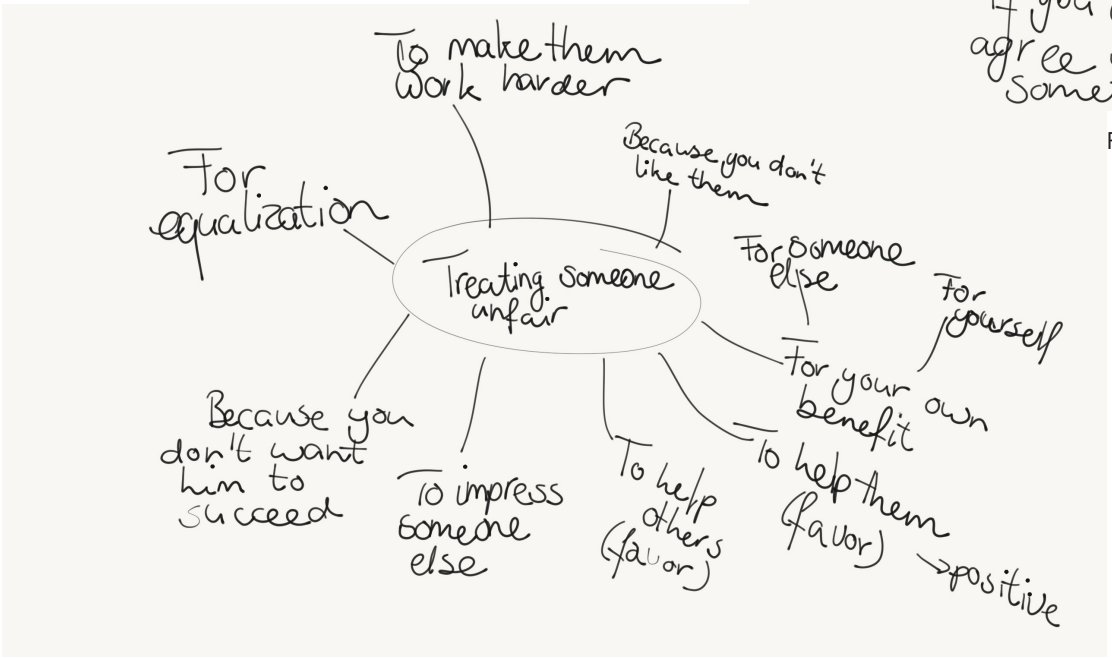


Figure 3.c Wordweb of 'Treating someone unfair'

3.4 Creating concepts

With the results from the eight game ideas and the additional brainstormsession, three improved games were created through combining and adjusting the ideas.
The three games are:

The full explanation of each concept can be found in appendix K

1. teQ's adventure

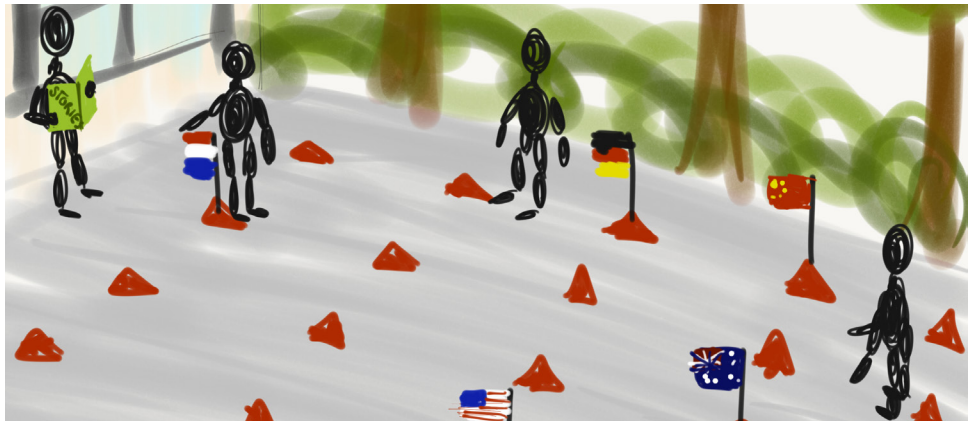


Figure 3.e Concept 1

Game elements

Game type	Active/board game
Goal	Fulfill the assignment
Players	3+, all against the game
Actions	Move (player) or move (pawn), ask/answer, puzzle/think
End of game	Assignments fulfilled or out of moves

Based on
Idea 1, Idea 3, Idea 4

Qualities
- Large quantity of players
- Use of big space
- Each game is different
- Good potential for yeartheme

Explanation
In teQ's adventure, the players are asked to help teQ by completing assignments. These assignments take place at specific locations on the playing field, where the players have to travel to, to do the assignment. The social/emotional measurement is done through the execution of the assignments.

2. Tower defense

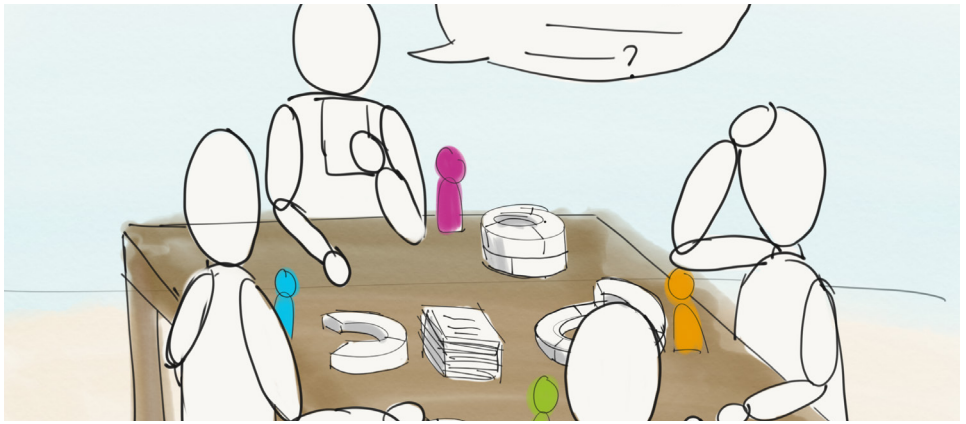


Figure 3.f Concept 2

Game elements

Game type	Board game/tabletop game
Goal	Assignment (build a tower)
Players	2-4, all separate
Actions	Ask/answer, build
End of game	Fulfill assignment

Based on
Idea 2, Idea 7

Qualities
- Lots of social/ emotional possibilities
- Can be played anywhere

Explanation
In Tower defense, the players have to build their own tower while preventing other players from building their towers by attacking them. The attacking and defending of towers is done through knowledge questions and the estimation of social situations. Through these situations, the social/ emotional measurement can also be executed.

3. Team dilemma

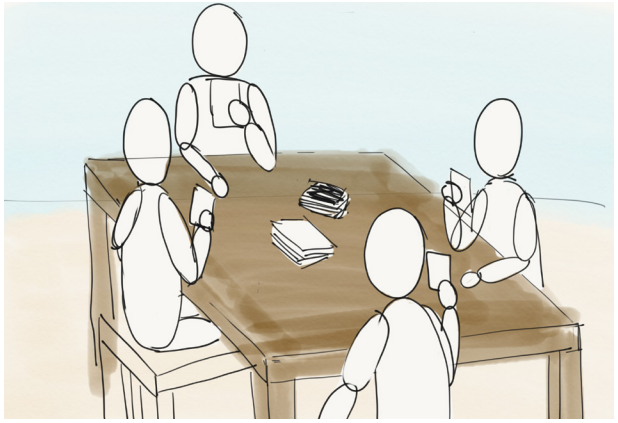


Figure 3.g Concept 3

Game elements

Game type	Card game/ active game
Goal	Win points
Players	4+, teams
Actions	Play & draw cards, decide, act, discuss
End of game	Amount of points achieved

Based on
Idea 5, Idea 6, Idea 8

Qualities
- Large quantity of players
- Can be played anywhere

Explanation
In Team Dilemma, the players work in teams in two rounds. In the first round, players have to get rid of their cards and make decisions that involve either the group, or only themselves. After getting rid of all their cards, the team can act out a word to win a point. The social/emotional measurement is executed through the decisions that are made.

3.5 Testing the concepts

Since the main goal of this project is to make a game that is entertaining for children of 6-8 years old, the three concepts were created out of paper and cardboard and given to three families with children in the target age group. Unfortunately, it was not possible to test the concepts with larger groups of children and/or at afterschool care because of COVID-19.

The main goal of this test was to test if the children found the concepts entertaining and to test the difficulty level. Due to the corona virus, it was not possible to be present during the tests, which resulted in more superficial feedback than prefered. However, the main testquestions could be answered.

The full results can be found in appendix L, the conclusions are listed below.

teQ's adventure

Test group
Played by two adults and one 7 years old girl

Prototype
In order to make the testing easier, the choice was made to test only the boardgame version of the game. The story of the game was that teQ wanted to give a party and needed the help of the players to collect different snacks from all over the world.

Figure 3.h Prototype of concept 1 and testing concept 1

Conclusion
Overall, the girl really liked the concept of the game; the story of collecting the snacks, searching for the next location, doing assignments. However some assignments were a bit too difficult for her to understand because it was too complex, like a version of the prisoners dilemma. Therefore, simpler assignments have to be found, however, since most assignments are part of the social/emotional measurement, this must still be taken into account.

Tower defense

Test group
Played by two adults and one 5 (almost 6) years old girl.

Prototype
The goal of the game was to build a tower containing 9 building blocks.

Figure 3.i Prototype of concept 2

Conclusion
Overall, the feedback to the game was positive, the girl really liked the building. However, the fake alliances was too difficult for her to understand. She also had difficulty in reading all the cards. It must be taken into account that the girl was younger than the target group, which might play a role in the understanding of some things.

Team Dilemma

Test group

Played by one adult and four 7 years old girls.

Prototype

In order to prototype this concept quicker, a UNO card set was used, of which some cards were taken. In order to prevent misconceptions, the deviating meanings from the regular game were explained very elaborately in the instructions.

Conclusion

The game was well understood by all players, however, the card part of the game was not liked by the girls at all. After the adult stopped playing, the girls continued only with the acting of the words, which they really liked. However, most social/emotional aspects of the game are present in the card game, which means that the game has to change a lot in order to still implement these.

Figure 3.j Testing concept 3 and Prototype of concept 3

Overall conclusion

Two out of the three games showed to be fun and entertaining for the children. However, it must be taken into account that these two games were only played by one girl each, which does not mean that all children will like it. On the other hand, it can probably be concluded that concept 3, which was tested by four children, is not entertaining for most children.

Because of the small test groups the conclusions from these tests can not be used as facts or strict guidelines. In order to be able to draw 'real' conclusions, the test groups would have to be bigger and with more variety in age and gender. However, because of the available time span and lack of contact with children due to the coronavirus, it was chosen to only execute these tests in this stadium.

Furthermore, since the focus of this test was to find out if the games are entertaining and if they can be understood by the target group, it is expected that these small tests are enough to be an indicator to continue with the design process.

3.6 Choosing a concept

In order to make a decision for the most promising concept to become an entertaining, social/emotional measuring game, a few things have to be taken into account on which the weighted criteria method is applied. The weighted criteria method is used to not only find the best concept, but also to see if the concepts are good, which can not be researched with for instance the datum method.

The entertainment level
Since the main goal of the game is to be entertaining for the children, this is the most important factor. For this, the results of the concept tests are used which made clear that concept 1 and 2 where fun, but concept 3 was not.

Completeness of the social/emotional aspects
Although it has been tried to include all social/emotional aspects, this was not completely succesful. However, it is still a wish to include as many of the aspects as possible. In paragraph 2.3.2, it was concluded that the social development category is the most important for the fit with SWKGroep, therefore, the completeness of this weighs the highest. Here, concept 1 misses a total of two categories and has all social categories. Therefore, it scores higher than concept 2, which only lacks one category, but this is one from the social development. Concept 3 misses five categories, of which two from the social development.

Measurability of the social/emotional aspects
Not only require the social/emotional aspects to be present, they also need to be measureable in order for the game to succeed in this part of the assignment. Since it is not known how the measurement will take place, this is only an estimation. For this, the combination of social/emotional categories and the use of props are taken into account. This makes concept 1 and 2 score high because of cards, while concept 3 more takes place between the players instead of props.

Fit in the context
SWKGroep wants a special game for at their afterschool care. This comes with some possibilities with the space and amount of players. Because of the use of these, concept 1 scores high, while concept 3 can take place anywhere.

Uniqueness
In order to really sell the game, SWKGroep wants an unique game. In order to score high, the game elements must be copied from/inspired by other games as less as possible.

Table 4. Applied weighted criteria method

	Weight	Concept 1	Concept 2	Concept 3
Entertainment level	35	9	9	5
Completeness social/emotional	20	9	8	6
Measurability	20	8	7	5
Fit in context	20	9	7	8
Unique	5	9	8	6
	Score	880	795	585

Conclusion

The weighted criteria method shows a clear winner; concept 1. It also shows that, mostly concept 1 and 2, both show to be a good fit, where concept 3 would not have been suitable for this purpose.

4. Game overview

In this chapter, the full game is explained. First, the full overview is given, after which each component is described individually, as well as the iterations that this component has gone through.

4.1 Game overview

In teQ's adventure, the players are asked to work together to help teQ fulfill a quest by collecting five parts related to the quest. The playing field and all components can be found in one overview in Figure 4.e.

Before the players can start, they have to decide on what difficulty level they want to play. This level determines how many turns they can take to collect the five parts.

To be able to collect the parts for teQ, the players have to execute assignments successfully. But not all assignments can simply be executed by any player. As each assignment requires a minimum amount of players and skill points, players have to decide for each assignment who is going to execute it. The skill points indicate what kind of assignment it is going to be.

In order to decide which players have to execute the assignment, each player has chosen the skill card that fits him/her best. This skill card contains points for each of the three categories (knowledge, active and creative). Players have to pick a skill card with high points in a category that they think they are good at.

Besides the amount of players and the skill points, each assignment has a location where the part can be collected. Players have to move over the playing field to reach the location, but some ways are blocked by obstacles. As the players have a limited amount of turns, they must take into account how many steps it takes for a player to reach a location. But, some players can take more steps than others, or can move diagonal or across obstacles. This is indicated by the character cards that the players have picked in the beginning of the game.

While collecting parts and moving across the playing field, different situations occur. After having used five turns, a situation card is taken which explains an extra situation that is happening. Before playing on, players have to execute or solve the situation.

During the game, in order to send their progress to teQ, and be able to record their actions, all playing cards are scanned with an app on a tablet by the players. They also fill in their answers to questions and record whether assignments have been completed successfully. During the game, the app also guides the players through the game.

The game ends when the players have collected five parts, or if they have used all their turns.

In the following paragraphs, all elements of the game are described separately. The paragraph number of each element can be found in Figure 4.e.

The explanation of each element also contains the iterations in the design process. These iterations are made with the results of user testing and consultations with the activity coordinator and pedagogical policy officer of SWKGroep.

4.1.1 Testing

Throughout the design process, the game has been tested with children aged 6-8. Due to COVID-19, is was not possible to test the game at an afterschool care location of SWKGroep. Fortunately, it was possible to test with children at a primary school in Haarlem.

In total, nine tests have been executed. Eight out of nine were with four children, the other one with five, all with both boys and girls. The first six tests are all executed with children who had never played the game before. Most tests are executed in pairs, which means that two tests were performed with the same prototype. This was done to enlarge the test group and base conclusions on more children. An overview of the four prototypes can be seen from Figure 4.a to Figure 4.d.
The tests are used as a main source of iterative decisions.

In appendix M, an overview of all tests with the prototype and focus can be found.

Figure 4.a Prototype 1.

Figure 4.b Prototype 2

Figure 4.c Prototype 3.

Figure 4.d Prototype 4.

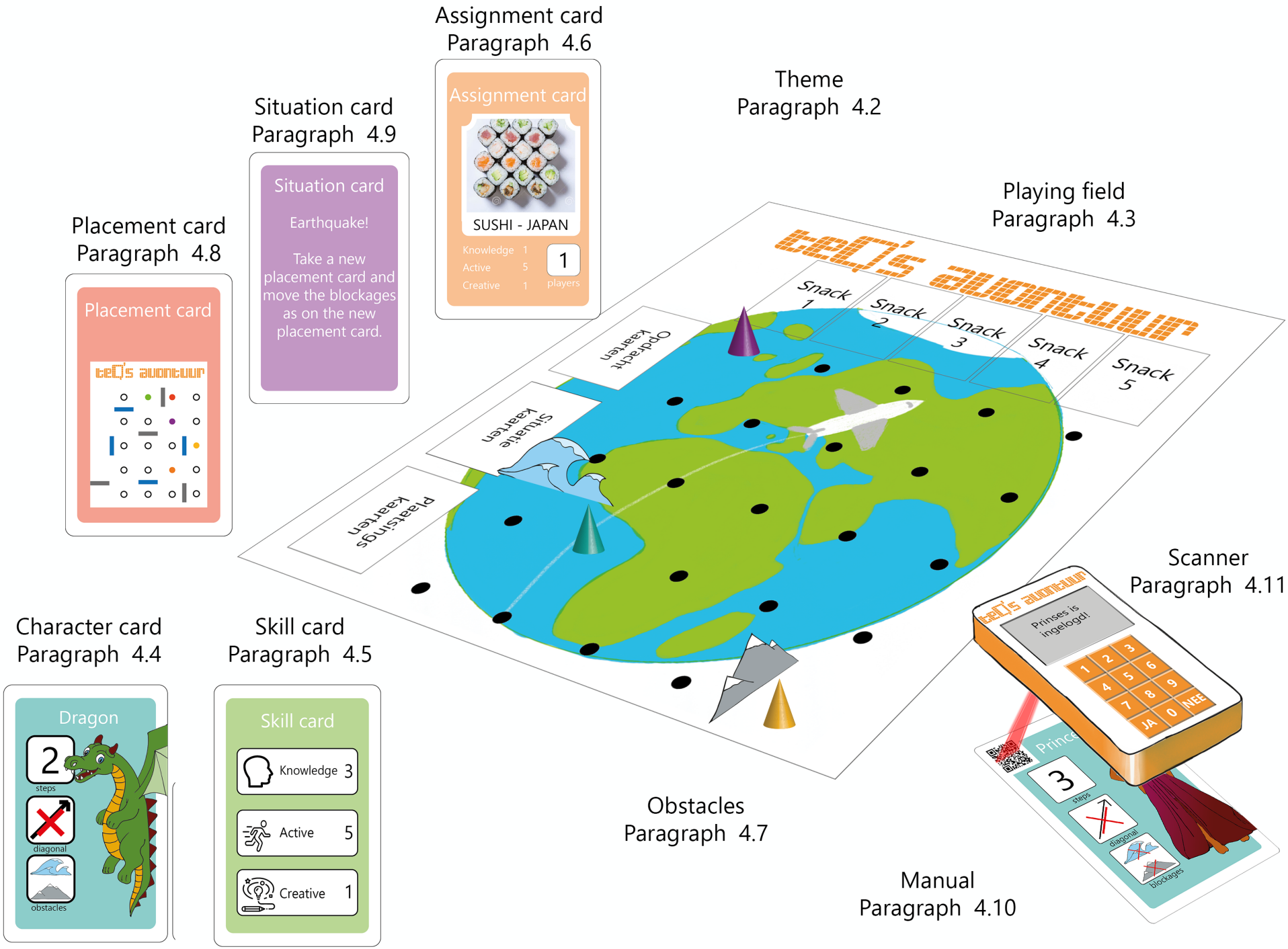


Figure 4.e Concept and paragraph overview

4.2 Theme

In order to make the game a 'true' SWKGroep game, their mascot teQ (Figure 4.f) is the main character of the game. During the game, the players are asked to help teQ fulfill his quest.

In this quest and on the board, the yeartheme is incorporated, as in paragraph 2.1 became clear that this is a great opportunity. Since the yeartheme changes every year, teQ's quest and the board also change every year to keep the fit with the yeartheme. This will also contribute to making the game more fun to play multiple times.

More about the adjustability to the new yeartheme can be found in chapter 6.

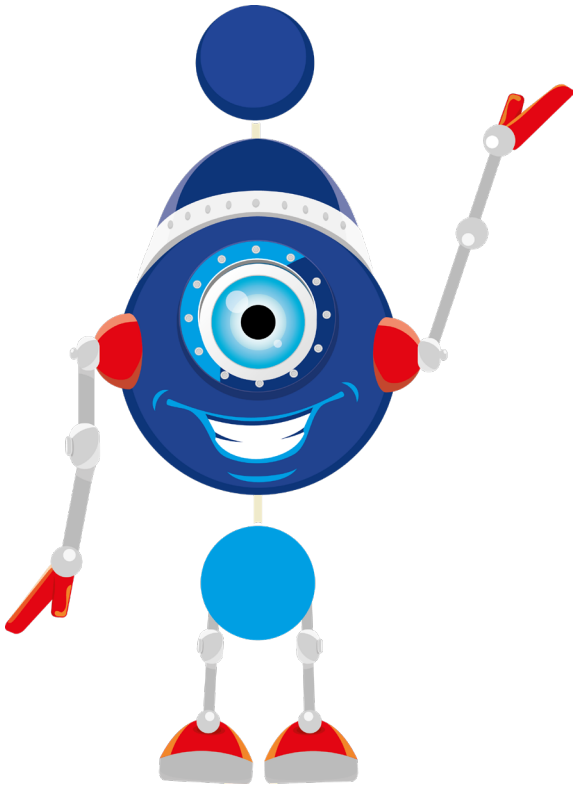


Figure 4.f teQ, prototype of SWKGroep

An example for the quest of the current yeartheme; Wonderful world, is the following:

teQ wants to throw a party, but he does not know what snacks we eat at Earth. He needs your help in collecting snacks from all over the world!

In this case, the locations on the playing field are countries, and every assignment is a specific snack.

This is also the example that is used in all usertests and incorporated in the prototype.

Aesthetics

Throughout the final design of the game, the used style is simple with a lot of visuals. This was chosen to fit the children best. The used color scheme comes from SWKGroeps' corporate identity, which is toned down to make it more appealing, as can be seen in Figure 4.g. The big orange letters on the board and the manual are also from SWKGroeps' corporate identity.

C 0 M 33 Y 92 K 0	R 249 G 182 B 16	C 60 M 0 Y 100 K 0	R 122 G 181 B 29
C 2 M 16 Y 52 K 0	R 252 G 218 B 143	C 34 M 0 Y 53 K 0	R 185 G 215 B 149
C 0 M 62 Y 91 K 0	R 238 G 124 B 34	C 77 M 3 Y 45 K 0	R 11 G 169 B 154
C 1 M 32 Y 48 K 0	R 247 G 189 B 141	C 49 M 0 Y 24 K 0	R 140 G 205 B 203
C 0 M 85 Y 92 K 0	R 230 G 68 B 35	C 58 M 93 Y 0 K 0	R 132 G 46 B 134
C 0 M 47 Y 38 K 0	R 243 G 160 B 144	C 27 M 47 Y 1 K 0	R 194 G 151 B 196

Figure 4.g SWKGroep colors on the left, toned down colors on the right

4.3 Playing field

The playing field of teQ's adventure is a grid of 5x5. A quality of the afterschool care is that the children are free to do what they want and just move around. They should not be restricted to one specific location, like a desk at school. Therefore, the game is played in an open space, where the grid is created with pawns. However, every afterschool care location is different in terms of available space. On top of this, is it possible that the children do not always have access to a big space, due to the weather or other activities. .

Therefor, the decision was made to make the game playable in two versions:
1. On a board, where each player plays with a pawn
2. In an open space with big pawns, where the players move themselves

The user tests were executed at a primary school, where only a small extra room was available. Therefore it was chosen to only test with and focus on the version of teQ's adventure on the board and use these results to iterate the game.

Life size version
In order to play the 'life size' version of teQ's adventure, 25 foam floor tiles are required, like in Figure 4.i. These can be placed by the children. The obstacles are printed onto the floor tiles. By placing them different each time, the gameplay changes, like the placement cards do for the obstacles in the board game. The locations are not printed on the tiles but shown in a grid in the manual.

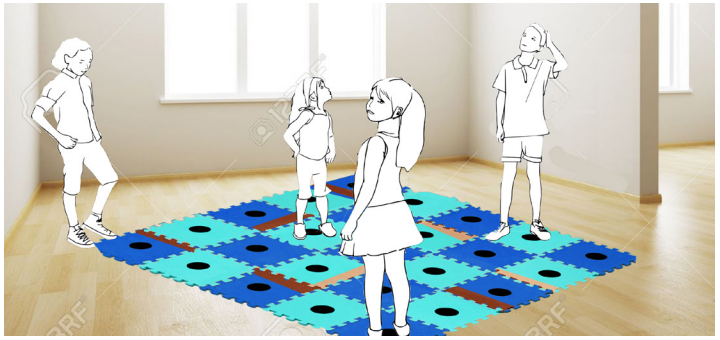


Figure 4.i Life size version of the game

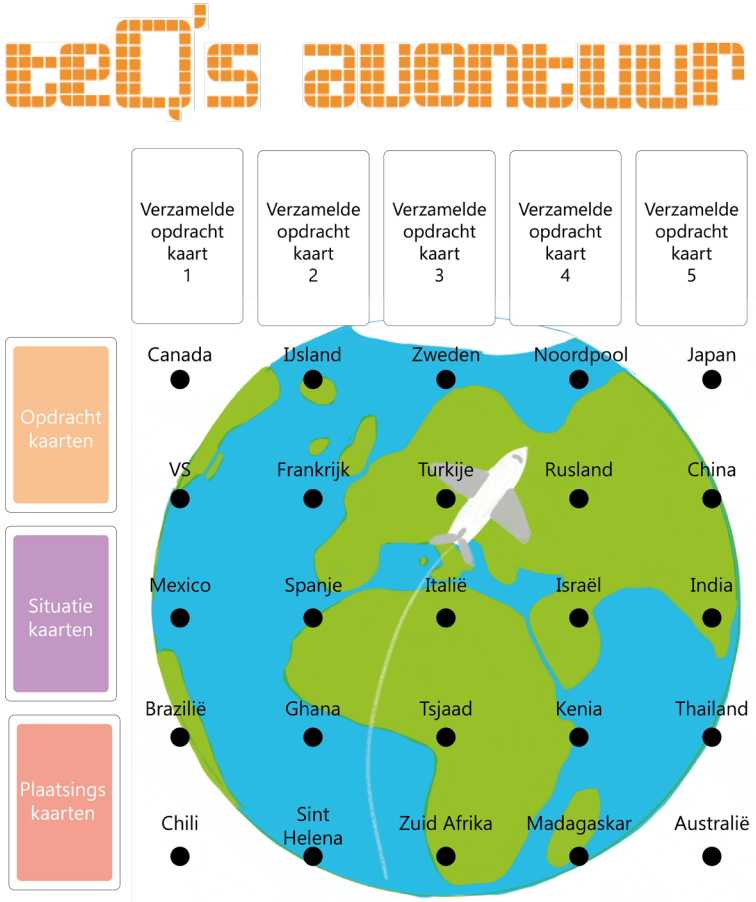


Figure 4.h Playing board of teQ's adventure

4.4 Character cards

During the game, each player has its own character. These characters are chosen by the players from the character cards and held onto during the game. Each character card contains an image of the character and the specifications about the movability of the character. The purpose of the characters is that each player has its own unique characteristics, which makes every player stand out. This showed to have a positive impact on the gameplay in the idea testing, described in paragraph 3.2.

SWKGroep wants all children to be equal and therefore does not want to stimulate stereotypes. Children are able to learn stereotypes at the age of 5-7 years old (Martin & Ruble, 2004), in which school, books and images play a big role. (Aina & Cameron, 2011) However, stereotypes do not have to be eliminated completely, as long as children learn about them and know that they as a person are independent of stereotypes. (Derman-Sparks, 2001)

In teQ's adventure, players can choose from a diverse range of characters, both male, female and gender neutral. Furthermore, the success of the players is based on the skill sets of the players themselves, as they choose their skill cards based on this. This creates a positive story with diverse characters, as Derman-Sparks (2001) claims to have a positive effect on children's perspective on stereotypes.

Iterations

In the first version of the character cards, as can be seen in Figure 4.j, the skill points, explained in the next paragraph, were included in the character cards. However, the first test showed that for 6-8 year old children, the focus is on the character, instead of on the skill points that fit himself best. Therefore, the two were split up. This test also concluded that the specific movement, like chess moves, might be too difficult. Therefore, as can be seen in the next version in Figure 4.k, only the amount of steps were specified.

The purpose of the character cards was to give each player their own characteristics. However, with only the amount of steps and ability to move diagonally or not, some character cards would always be better than others.

With the addition of obstacles, see paragraph 4.7, this was solved. Now characters that can take less steps, do have the ability to move over specific obstacles. Since the design then contained a lot of text, it was decided to make the character card more visual, as can be seen in Figure 4.m.

Figure 4.j Version 1 of character cards, including skill points

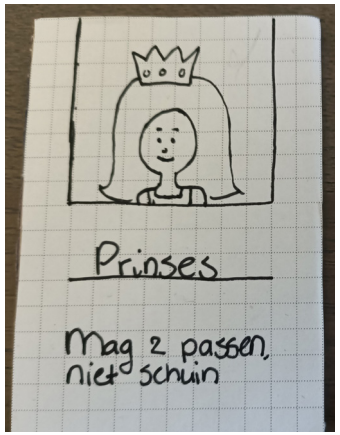


Figure 4.k Version 2

Figure 4.l Version 3

Figure 4.m Final design

4.5 Skill cards

Besides the character cards, every player has a skill card with skill points. These skill points can be used to decide which players are going to execute an assignment, since every assignment has a required amount of skill points. Each skill card has 9 points, devided in 5 points, 3 points and 1 point.

In order to assign skill cards, players have to decide for themselves which skill they are good at, and in which skill they are less good at. These skills thus refer to the player himself, not to the character.

The skill cards are a part of the social/emotional measurement system, since it enables the measurement of whether the players know their own qualities.

Iterations

In the first version of teQ's adventure, the used skills were smart, strong and sweet. These characteristics were based on No Thank You, Evil!, a tested game in the ideation phase. However, since the skills give an indication of the type of assignment, smart, sportive and creative were found to be a better fit. Usertest 2-5 showed that the children were capable of determining which card would fit them best, however, the youngest children had some struggles with the understanding/reading of 'creative'.

Together with the pedagogical policy officer it was then concluded that smart and sportive have a judgment that comes with them, which can be experienced negatively. Therefore, the words were changed to more neutral words: knowledge, active and creative.

During the tests, the children could easily decide which skills fit them best. If necessary, they would help eachother by saying which skills the other player is good at. The focus for the children was always on what they are good at, they never decided a card based on what they are less good at.

In order to make the words also easier to understand, icons were added.

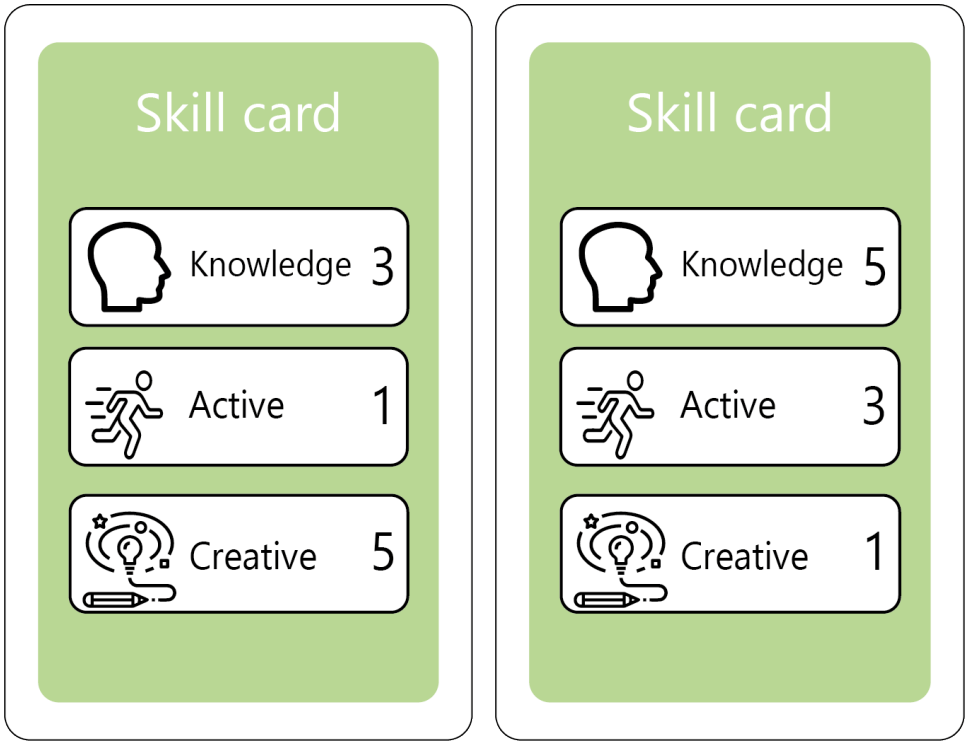


Figure 4.n Skill card examples

4.6 Assignment cards

The main goal during the game is to collect assignment cards. In order to collect an assignment card, the assignment has to be fulfilled successfully. But, before the players can give the assignment an attempt, there are a few steps to take.

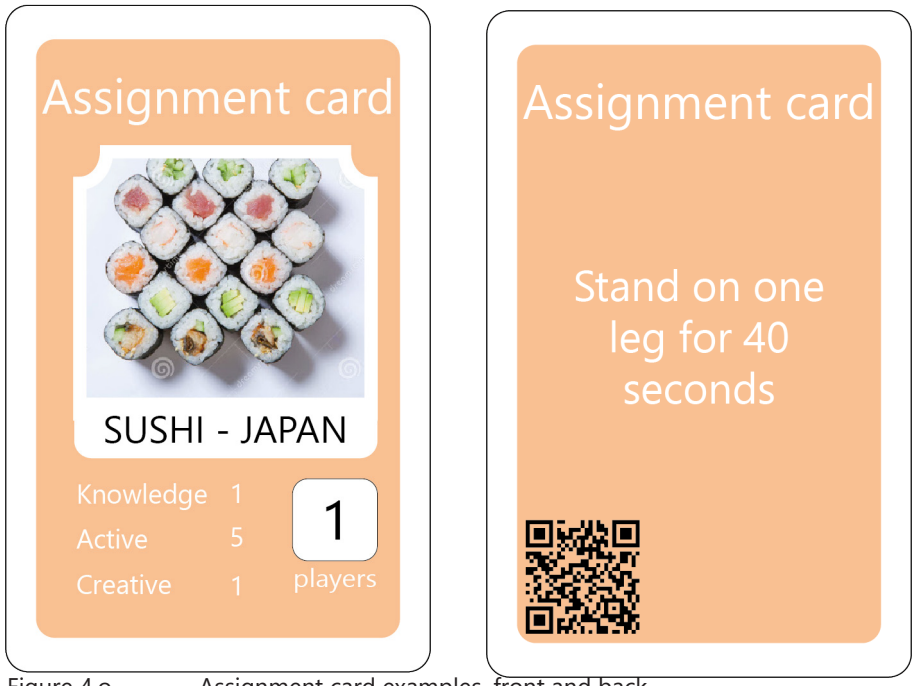


Figure 4.o Assignment card examples, front and back

As can be seen in Figure 4.o, each assignment card has two sides. The front side is read when the card is taken from the stack, the backside is read when the players are ready to execute the assignment.

Each assignment card contains four pieces of information:

1. The part that can be collected
   The image and name below indicate what part can be collected with the assignment. What part it is does not influence the game, as it is only an addition to the implementation of the year theme.
2. The required skill points
   The skill points indicate what kind of assignment it is. An assignment that requires high active points might be to do push ups, while high creative points might be to draw something.
   The players who execute the assignment can always have more skill points than required, but never less.
3. The required player amount
   Some assignments require more players than others to be executed. Again, if more players are necessary, this is always possible. If it is not possible to have all skill points with all players, this assignment can not be executed.
4. Location
   Each assignment is executed at a specific location on the playing field, which is indicated on the field. When deciding who are going to execute an assignment, the location must be taken into account because of the required steps to move to this location. As the players have a maximum amount of moves (game difficulty), players who are closer to the location might be more beneficial to choose. During the game, the players count their moves with the scanner, which also continuously shows the total amount of used steps.

In total, there are three types of assignments

1. A described situation for which the players have to answer how they would react
2. Assignments for which players can, based on the category/theme of the assignment, decide if they want an easy or difficult assignment
3. Assignments for which players can, after hearing the assignment, decide if they would want help to execute the assignment

The assignments are the main source of information for the social/ emotional measurement. In paragraph 5.1 a more detailed explanation of each assignment, as well as how it measured can be found.

Iterations

Some assignment cards should not be read by the players who are going to execute the assignment because of answers to questions, but others can be read by them. Therefore, at first, coloured dots were added to the cards to indicate which type of assignment it was. (see Figure 4.q) This colour also indicated who can read the card. In the user tests it however became clear that this was too much information to remember and was not intuitive. Therefore it was decided to treat each assignment card the same; the card is always read by someone who is not going to execute the assignment. In practice, the children were most of the time excited to know the assignment and would start reading it beforehand.
With the implementation of the scanner, it was decided to put all 'sensitive' information in the scanner. This information thus only becomes available after having executed the assignment. With this decision, the coloured dots were removed from the assignment cards.

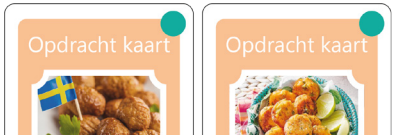


Figure 4.q Assignment cards with the coloured dot

4.7 Obstacles

In concept test 1 and 2, the focus lied on the entertainment level and the understandability of the game. The next point of attention then was to make sure that the game would be entertaining to play multiple times. Consultation with the activity manager of SWKGroep made clear that an element that makes (board)games entertaining to play multiple times, is that the gameplay if different each time. This can be because of different type of players with different tactics, but since it is expected that at the afterschool care children will play with the same children over and over again, the change between games must be stimulated.

Test 2 also made clear that the children did not really focus on their movement from point A to point B, since it was always possible. Therefore, obstacles were introduced. These obstacles prevent some characters from taking certain paths. By changing the location of the obstacles with each game, or even during the game, it is prevented that the game is the same each time.

The location of the obstacles is given with placement cards, explained in the next paragraph.

Iterations

In test 3, the obstacles were introduced for the first time. They were a success in terms of planning routes, however, because it only blocked four paths, it did not do a lot. Therefore, it was chosen to have eight instead of four obstacles.

On the design of the character cards, the obstacles are visualized. Because of space restrictions, the mountains and volcanoes were combined and only visualized as the mountain. However, this created some confusion in the test. Therefore, it was decided to remove the volcanoes from the game and only use the mountains, since their function was already the same.

Figure 4.p The two types of obstacles and removed volcanoes

4.8 Placement cards

With the placement cards, the players are able to know where to place the obstacles, as well as where their starting point is. In this way, each time the game is played, it has a different set up.

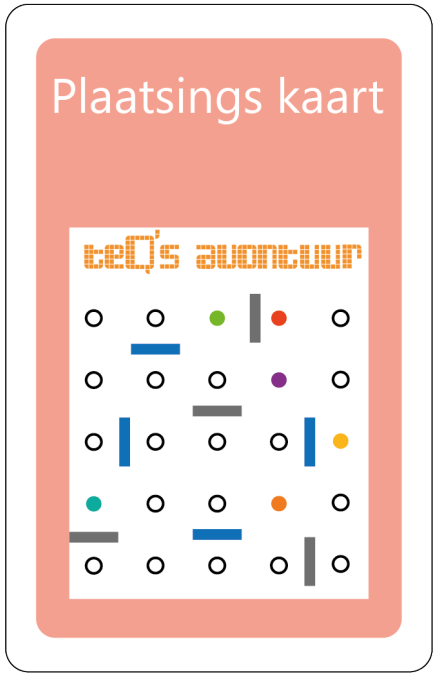


Figure 4.r Example of a placement card

4.9 Situation cards

As paragraph 4.7 described, a way to make the game more entertaining to play multiple times, is to make each game different from the other. Besides the obstacles and their placement, situation cards are added to accomplish this. These cards describe situations that have to be dealt with at that moment, or change something for specific players. Some of the situation cards are also part of the measurement.

Each time the players have used five moves, the scanner indicates this. At this point, a player takes a situation card from the stack and scans it with the scanner. The situation/assignment must be executed immediately.

Figure 4.s Example of a situation card

4.10 Manual

Besides the playing field, pawns and all the cards, the game include a manual for the players to learn the game from.
Although it is expected that the pedagogical employees will go through the first time with the children, it can also happen that children want to play it for the first time for themselves, or that they have to look up a rule.

Iterations

During the second test, the game was explained by me, to have more control over the situation. However, since it is a wish for the children to be able to learn the game themselves, in the third test, the game was handed to them, without any explanation.

In this test, the manual was a 2A4 text, without any images. One player read the full text to the other players, however, it was way too long. Besides, after reading the manual, the players still did not understand what to do, because they were not paying attention throughout the entire time the girl was reading the text. Therefore, during the game, some extra tips had to be given.

With this insights, a new manual was made with lots of visuals like the preparation visual on page 48. Additionally, a 'remember' card was made, that the players can setup next to the game to know, during the game, what the steps to take were. This can be seen in Figure 4.t.

In the final test, in order to test the understandability of the manual, the game was played by four children that had never seen or played the game before. Although two of the players were very well readers who also really like to do it, they both indicated that the text was too long. They were able to read it all, but were not able to translate it too what to do. Therefore, the conclusion was drawn that for the first time, the pedagogical employee must explain the game. The children can however look up specific information or use the remember card if they forget a specific rule.

The full manual can be found in appendix N.

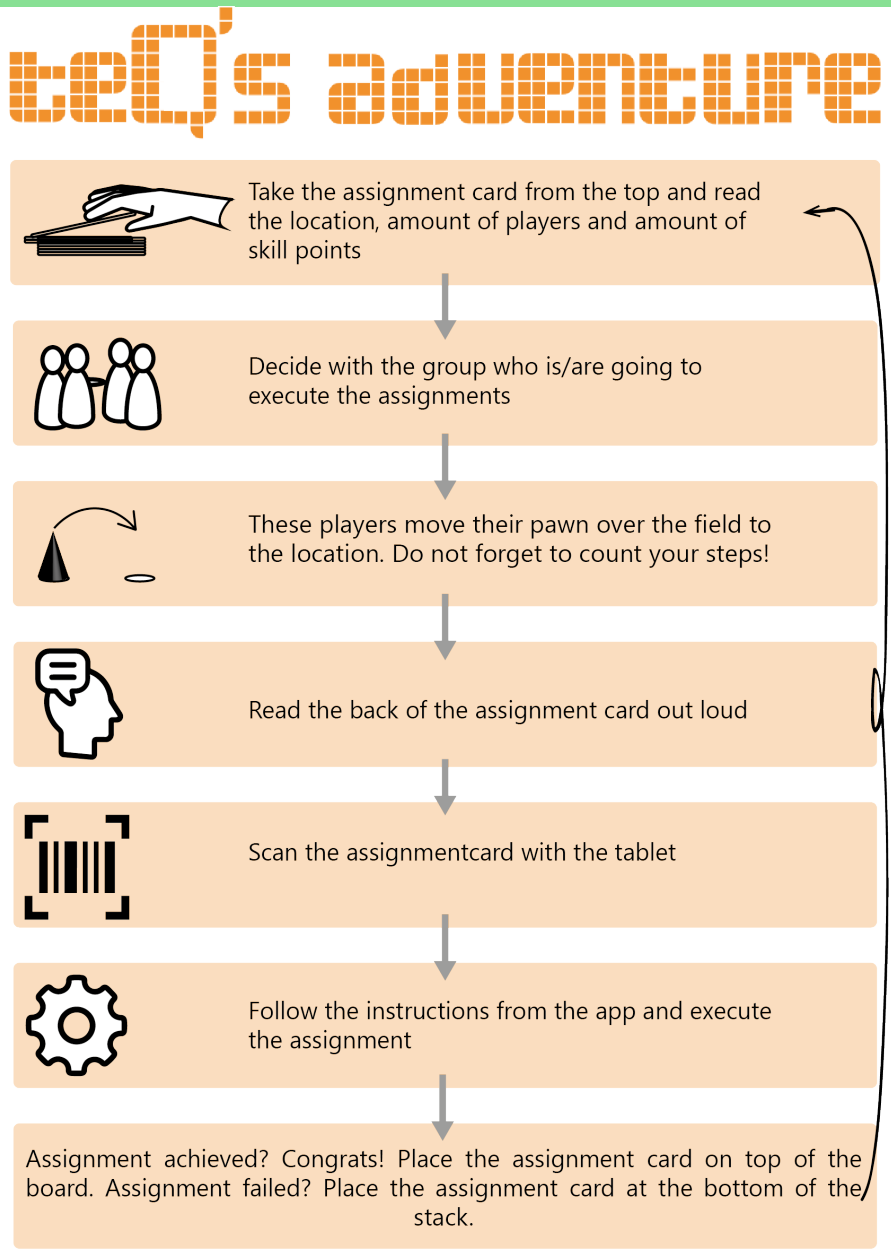
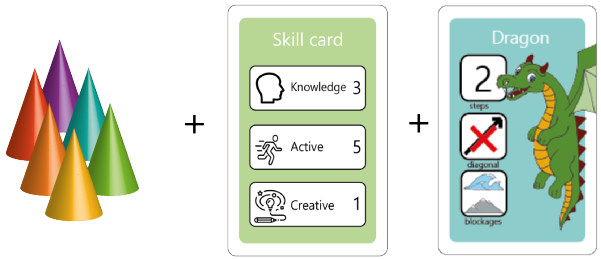


Figure 4.t Remeber card for during the game

preparation

1. Every player takes



1 pawn of choice | 1 skill card that fits him best personally | 1 charactercard of choice

2. Place the board in the middle of the table, make sure that everyone can access the board easily.

3. Shuffle the cards and place them at the indicated place on the board

4. Take the top Placement card and place all rivers, mountains and pawns as indicated.

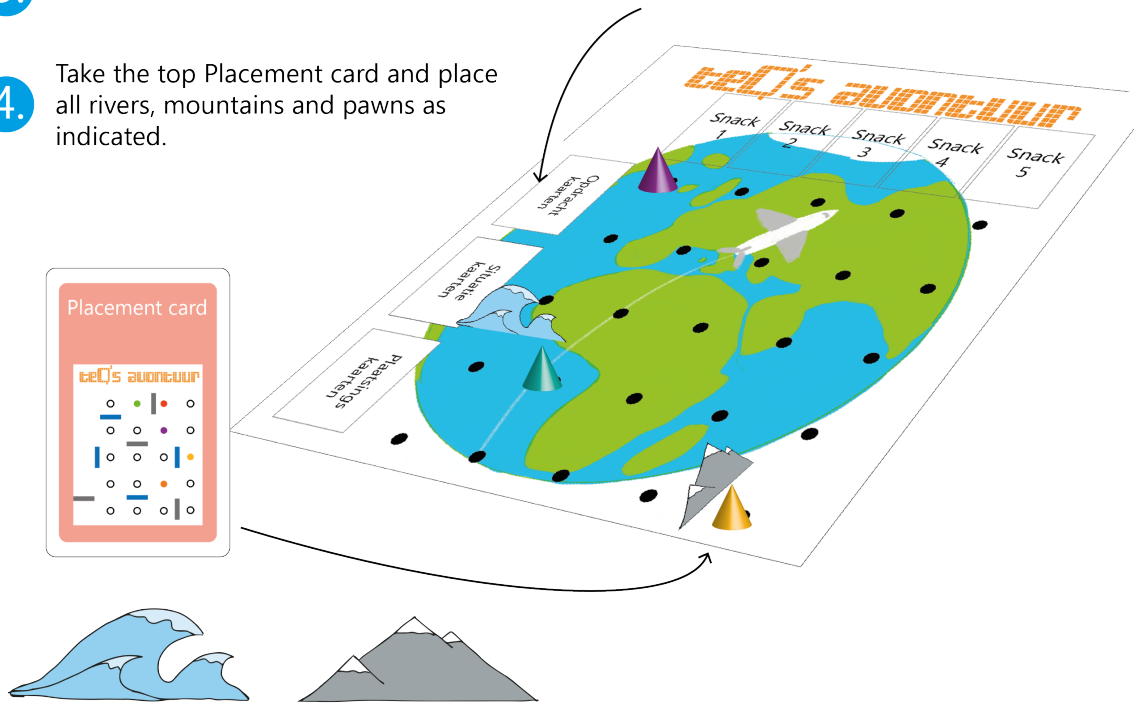
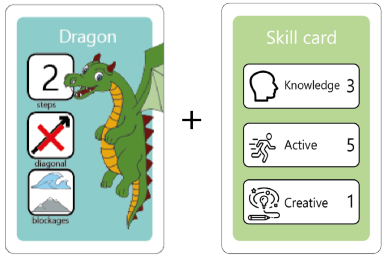


Figure 4.u Preparation part in the manual

5. Turn the scanner on with the on switch on the back

6. Each player logs in with his personal number, character card and skill card.



character card | skillcard

7. If all players are logged in, press 'Next', if more players have to log in, press 'Extra player'.

8. With the group, pick a difficulty level and enter this in the app

9. You are now ready to play!

4.11 The scanner and app

After multiple tests had validated that the game was understandable and entertaining for the children, the next step was to implement the measurement system in the game. Although the social/emotional elements were already implemented in the game, there was no system in place that collected the data from the measurements.

Therefore, a scanning system in the form of an app was created. Each card in the game has a unique barcode. During the game, the players scan these barcodes, which makes it possible to collect all the required data from the game. The steps that the players have to execute can be found in the scheme in Figure 4.v. In this scheme, the three types of assignments are included. After scanning the assignment card, the app will indicate the next step. In this way, the players are guided through the entire process, which makes it easier to execute and limits possible mistakes.

The app will be downloaded on the available tablets at each SWKGroep location, which are present because of administrative reasons. The children can use this tablet during the game.

One possible problem was that the children would not scan the cards, because it might feel like an unnecessary step that only slows down the game. Therefore, it was made sure that the app is required to play the game. The way that this is done, is that questions and/or answers are only shown on the app instead of on the assignment card, or that whether an assignment is successfully completed can only be known by the use of the app.

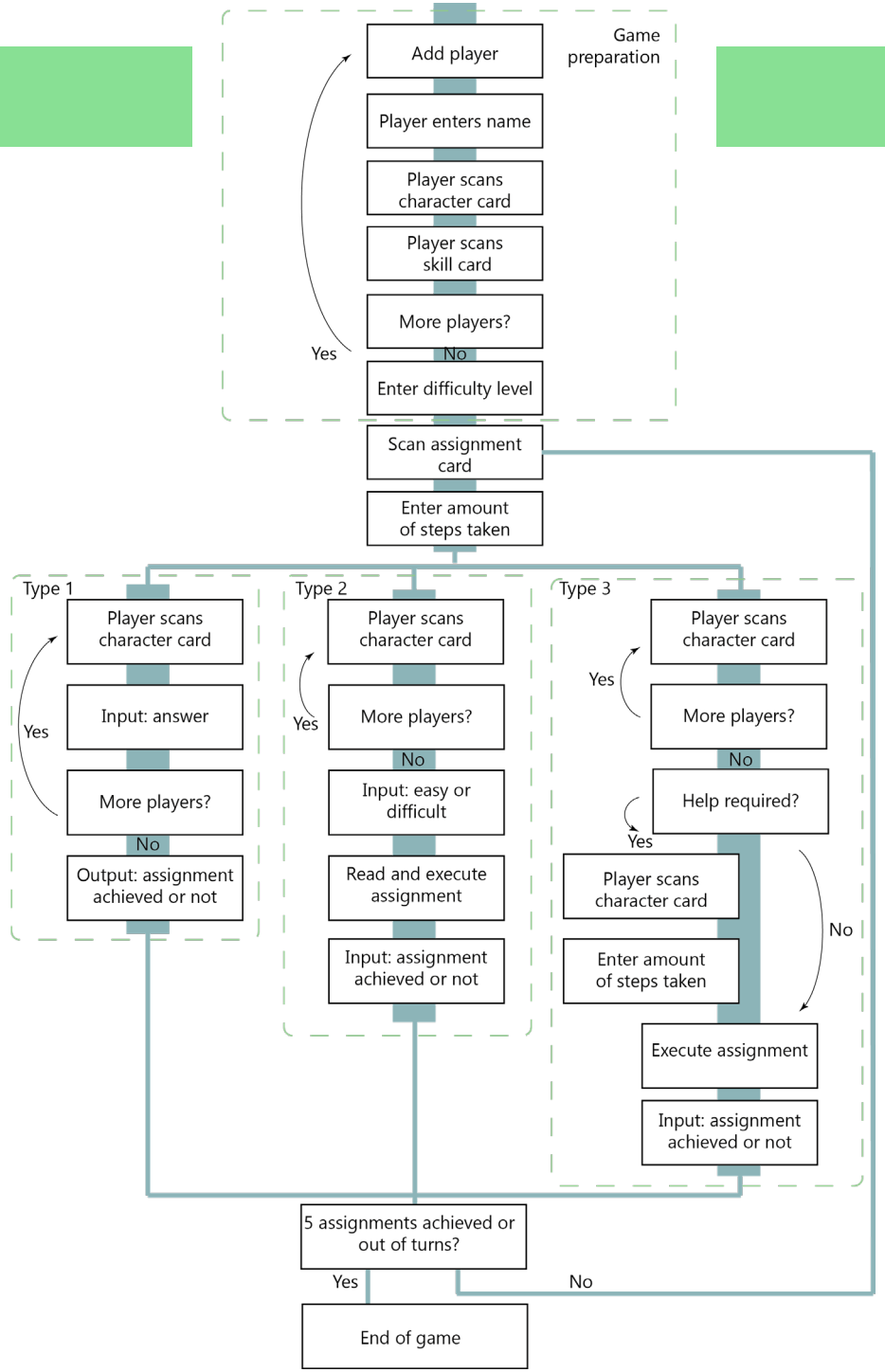


Figure 4.v Scematic of steps for the players to take

Testing

Due to time and source restrictions, it was not possible to build the app, Therefore, a simpler version was created to test. The most important part of the test was to see if the players understood what they had to do (from the manual), did this correctly, and were motivated to do it every time.

In order to simulate the scanner as much as possible, a QR code was included in the assignment cards. After scanning the assignment card with a smartphone, the players would be directed to a Google Form, where they had to fill in their answer.

In this way, the players could experience the use of the scanner and can be motivated/triggered by the feedback from the scanner, which would not be the case if the players would have to pretend to scan with a piece of cardboard.

Iterations

The first idea of the system was that the scanner would be an extra device, like in Figure 4.w. However, because the test showed positive feedback on the use of the smartphone, it was decided to use the tablet that is already available instead. Besides this, because of the available tablet at the locations, this would save money.

Using the scanner in the life size game

During the board version of the game, it is expected that, like in the test, the 'scanner' would lie on the table and picked up when necessary. Since all players stayed in the same place, it is than easy to hand it over.
If the game is played with the floor tiles, this can be a bit more difficult. The easiest option would be that one person (child or pedagogical employee) would be 'The scanner'. This person can hold onto the tablet and move to the children that have to scan. This person would then not play the game. However, it is expected that this person (if it is a child) would also want to play along. This person than has to move and remember his position at all times in order to keep the game fair. However, in the case that a player goes back to another position, although this influences the fairness of the game, it does not influence the measurement.

Figure 4.w Scanning a characcter card

The app

In the ideal situation, an application is developed for the children to use. However, professional app development comes at great costs, which possibly does not make it worthwhile.

When looking at the required app with more detail, it requires five functionalities:

- Scanning the cards (with the camera on the tablet)
- Showing the corresponding information from the card
- Collecting data
- Transforming collected data to spreadsheet
- Transforming data to results

The first four functionalities are possible to execute with Google Forms, as was used in the user tests. The final functionality can then automatically be applied when downloading the data in a spreadsheet with simple IF/WHEN statements. This means that no expensive app development is required to be able to measure within the game, although it can be a cumbersome method.

In the available time of this master thesis, it was not possible to develop the app further. It is recommended for SWKGroep to hire an app developer to further process this, as they do not have experience with app design.

5. The measurement

In this chapter, the implementation and processing of the measurement is explained.

5.1 Implementation of the social/emotional domain

As mentioned before, current measurement tools for the social/emotional measurement make use of observations over a longer period of time. In this period, the children have to deal with/react to a lot of different situations in which every social/emotional category will most likely have come across multiple times.

In order to simulate this as much as possible in the game, it is tried to implement every social/emotional subsubcategory in multiple ways. As most subsubcategories are measured through the assignments, three types of assignments are created, as was briefly explained in paragraph 4.6.

In this paragraph, the way that the categories are measured is explained into more detail, divided over the different types of executing this. For the full list per social/emotional subsubcategory, its implementations and structure, please see appendix O.

5.1.1 Type 1 assignments

Since there are 23 subsubcategories to measure with the game, it is not possible to implement every one of them in a 'real life situation' in the game without making it too long or too complicated for 6-8 year old children to understand. Therefore, in type 1 assignments, the players are given hypothetical situations for which the players have to indicate what they would do in that situation.

The Heinz dilemma (Kohlberg, 1981) is such a technique, that is used to measure the moral level of people. It basically introduces the subject to a situation where the subject has to consider the different options of what to do in that situation. Through the years, there has been some negative feedback on the technique because it explains a hypothetical situation instead of a real-life situation in which the subject is truly invested.

Therefore, Walker et al. (1987) have put this to the test. In line with some more tests about moral testing, they researched whether the moral thinking and moral level of Kohlberg of the subjects was different in hypothetical situations as from real life situations. Their research concluded that the moral reasoning in hypothetical situations would be slightly higher, but still is a competent way of testing the moral reasoning overall.

With this conclusion, and consultation with the pedagogical policy officer, it is assumed that this is also applicable to non moral situations and can therefore also be used in the game.
The answer that the players give is directly used for the social/emotional measurement.

Execution

With type 1 assignments, the players are presented with such a hypothetical situation. They then have to decide for themselves, how they would react/ behave in that situation.
At first, only yes/no answers were implemented. However, the reasoning behind their choice is also important. Therefore, the answer possibilities were expanded to three or four full sentence answers. The players now have to pick the answer they relate the most to. This still limits the reasoning, however, letting the players type their full reasoning would create too much data for the pedagogical employees. This makes this a reasonable midway. This assignment is always executed by two players. The assignment has been executed successfully if the two players answer the same answer. In case there is a third player, still only two players have to answer the same.
Since the answer is directly used for the measurement, it is important that the players answer the question truthfully. In order to prevent the game element of winning the assignment from influencing their answer, the players do not know that they win the card if they answer the same. It is however possible that they find this out themselves. Therefore, some other rules are implemented:

- Players are not allowed to discuss their answer
- Players are not allowed to look at what the other player answers
- The answers (displayed on the tablet) change order after a player has answered
- There is a time restriction, enough for the player to read and choose an answer, but not enough to have a discussion. .

Implementation

Type 1 assignments are used for 13 out of the 23 subsubcategories:

- Problem solving
- Asking for help
- Having respect for authority
- Helping others
- Explaining your actions
- Making up with people
- Keeping a secret
- Recognizing unfair treatment (self and others)
- Treating someone unfair and apologizing
- Standing up for someone else
- Understanding why someone did something wrong
- Following the rules

Examples

The type 1 assignments are logically implemented in all moral development categories. One other subsubcategory where this type of assignments is used is with 'Having respect for authority' from the social development. Since the core or 'Having respect for authority' is whether the child will follow the decisions of authority in any way, the situations that are presented will sometimes be logical situations, but also less logical situations. One example for the latter is:

You and your classmates are playing outside. When it is time to go inside, the teacher announces that every child who wears blue jeans can play outside for 10 more minutes, the rest, including you, has to go inside. How do you react?

- If the teacher says so, that is the case, she surely will have a logical reason for this.
- You do not agree but listens anyway
- You protest and refuse to go inside.

Figure 5.a Examples of type 1 assignment cards

5.1.2 Type 2 and 3 assignments

In contrast to assignment type 1, assignment type 2 and 3 are not used as a direct measurement. These types record the decisions that the players make in the game.
Besides functioning for the measurement, type 2 and type 3 assignments take the game from being a question game, to an afterschool care location game. In these assignments, children have to move around, collect objects and make use of the space/objects/people they have available around them.

Both type 2 and type 3 assignments record the following categories:
- Making concessions
- Taking other people into account
- Knowing own qualities

On top of that, type 2 and type 3 assignments have separate measurements.

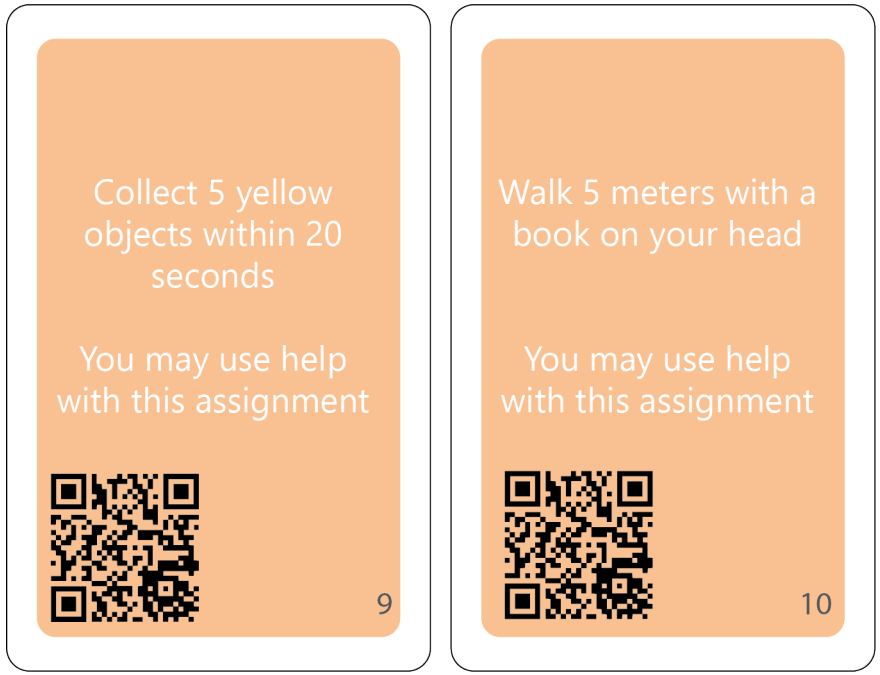


Figure 5.b Examples of type 2 assignment cards

Type 2 assignments

With type 2 assignments, the players have to indicate if they want an easy or a difficult assignment, based on the category/theme of the assignment. This enables the game to measure whether players know their own qualities. In comparison to type 3 assignments, type 2 assignments are used to test more individual traits and whether the players can execute the assignment successfully.

Execution

After another player has shared the category/theme of the assignment, the chosen players can choose between an easy or a difficult assignment. However, in order to measure whether they indicated this correctly, in both situations they get the same question.
In this way, children can be split up into better than average and lesser than average.
At first, the children would get either an easy or a difficult assignment. Here, the easy assignment was based on 6 year old children and the difficult assignment was based on 8 year old children. However, this would not be a fair measurement, as some children might be better than their age group, but if the difficult assignment is too difficult, it would give a wrong indication.

As the children have to indicate on the scanner if they want an easy or difficult assignment and the scanner than gives the assignment, they will not know that it was the same assignment.

Implementation

Beside the combined measurement with Type 3 assignments, four out of 23 subsubcategories are specifically measured with the use of type 2 assignments:
- Without initiative nothing happens
- Problem solving
- Knowing own qualities
- Keeping your emotion to yourself

Examples
A lot of different assignments can be used as type 2 assignments. Three examples are:
- Jump 2 meters
- Draw a school and let the other players guess, you have 30 seconds
- Knowledge question - Math: What is 13+8?

Type 3 assignments
With type 3 assignments, the players have the option to use extra help after hearing the assignment. On top of the same measurement qualities as type 2 assignments, type 3 assignments are used to measure if players dare to ask for help and can indicate correctly when they need it. In comparison to type 2 assignments, type 3 assignments revolve more around working together and less about succeeding.

Execution
After the players have read/heard the assignment, they can choose to ask help from a specific other player. Whether the players used extra help does not make a difference in the collection of the card, however, it does cost extra turns, which has an influence on the tactics.

Implementation
Beside the combined measurement with Type 3 assignments,, one of the 23 subsubcategories is specifically measured with the use of type 3 assignments:
- Asking for help

Examples
A lot of different assignments can be used as type 3 assignments. Three examples are:
- Act out an orchestra within 30 seconds, the other players have to guess
- Walk with a book on your head for 5 meter
- Let a pedagogical employee say the word penguin without saying it yourself

5.1.3 Other measurements

Besides the three types of assignments, other game elements contribute to the social/emotional measurement. In total, 8 out of the 23 subsubcategories are measured through these game elements. The game elements are the situation cards and the decisions that the players made that are not specifically within an assignment. For instance, if all players roughly execute the same amount of assignment, which is used for the measurement of 'making concessions'. Another example is the situation card with a secret that has to be kept in order to win extra turns for the 'Keeping a secret' subsubcategory.

5.1.4 Quick overview
The table below describes a quick overview/summary of the four types of data collection.

Type	Amount of categories	Kind of action
1	13	Estimating behaviour for hypothetical situations
2	7	Active, creative or knowledge assignment
3	4	Active, creative or knowledge assignment
Other	8	Decisions in the game and situation cards

Figure 5.c Examples of type 3 assignment cards

5.1.5 Measure effects

A problem that can occur when measuring something with the same people multiple times is the measure effect. The measure effect describes the change of behaviour because of the measurement, which makes a second measurement different from the first.

The teQ's adventure, measure effect can occur in the first few times it is played. This is because the first time a game is played, players mostly are still trying to understand the rules and the best tactics. Therefore, the first time a player plays the game, the measurement might not be accurate and can possibly not be used.

One thing that might have an influence on the measurement, is the fact that with Type 1 assignments, the assignment is won if the same answer is given. This means that for the game it does not matter what the players answer, but it really does for the measurement. In order to prevent this influence, some precautions were added to the game, as were described in the previous paragraph.

5.1.6 Missing categories

After having set the 23 subsubcategories of the social/emotional domain, the goal was to implement all these categories in the game and be able to measure them. However, it was not known whether this would be possible. Therefore, the goal of the project was to research how and to what extent it was possible to measure with the game.

From the beginning of the design process, it has been tried to implement all 23 categories into the design. Changes in the game because of understandability for the children and better gameplay had a big influence on this implementation. Therefore, the main focus on the completion of the measurement came after it was made sure that the gameplay works and is entertaining for the children. As this was still the main goal of the project.

With the current design of the game, it was not possible to implement and measure all 23 categories. Namely, two categories are not implemented. The two categories are:

- Asking for opinion of others
- Asking how someone is doing

Both categories come from 'Interaction with others' in the Social Development category. This category was set to be most important to be implemented in the game in paragraph 2.3. Therefore, all available resources (wordwebs, brainstorm sessions, consultation with pedagogical policy officer) were used, but without any luck.

The problem with these two subsubcategories is not that players will not perform the task, but that it is not possible to measure this in a natural way. The core of these two categories is performing them because you want to, not because you feel obliged in a game. Having to record performing them would therefore feel unnatural.

It is possible that in a different type of game(structure) this can be possible, but further research would have to show this.

5.2 Processing the data

As explained in paragraph 2.3, the way of processing data from KIJK! can also be used in the measurement system in the game. This manner is to score each statement with +, +/- or -.

In the game, all actions and answers are collected by the scanner. The software behind the scanner than transfers all these actions and answers to +, +/- or -. Which action or answer transfer to what score can be found in Appendix O.

There are also some limitations to this system. Because of some specific implementations of social/emotional categories, some can only be concluded with a + or -. This also means that if a child does not 'meet the requirements' to score a +, he also does not get a -.
Most categories are measured on an individual basis, however, for some this was not possible. Then, a group outcome will be shown.

Since the players 'only' have to collect five assignments, it is not expected that all 21 categories are measured after playing once. Furthermore is the measurement more reliable after a few times of measuring. Therefore, after the game is played multiple times, the pedagogical employee can process the data. The pedagogical employee can always check beforehand if enough measurements has been executed for the analysis.

After enough data is collected, this information can be used by the pedagogical employee to determine points of attention for each child. This step is the same as with the current system. The measurement in the game is thus only used for the collection of data and does not show a final conclusion for a child.

Example

As explained before, a smartphone was used to test the scanner system for the understandability for the children. This also collected data from these tests. Because the test was simplified, only the assignment cards were scanned and their answers were collected. It is therefore not known who has executed which assignment, which means that no personal results can be shown.

During the test, one of the executed type 1 assignments was; "Imagine, there is a rule of school that you can never play ball on the playing field. It is weekend, there is no one there and you want to play ball. What would you do?" This assignment is about whether players follow set rules.

The two players scanned the card with the phone and answered separately. The first player answered: "Do not play ball", the second player answered: "Play ball". This therefore results in a + for the first player since he follows the rules and a - for the second player, since he does not follow the rules.

This step and three other results can also be seen in Figure 5.d.

Time and date	Number of assignment	Player A	Player B	Result Player A	Result Player B
29-6-2020 13:14:07	3	Do not play ball	Play ball	+	-
29-6-2020 13:30:06	1	I do not care	I wonder why my father gets two cookies, but eat mine and move on	-	+/-
29-6-2020 14:01:51	4	I tell him he did not do it	I do nothing	+	-
29-6-2020 14:13:33	3	Play ball	Play ball	-	-

Figure 5.d Collected data and results from usertest

6. Game template

6.1 Yeartheme

As paragraph 2.1 concluded that the yeartheme must be incorporated in the game. This also means that the game must be adjustable to a new year theme.

General

The quest that teQ asks the players to fulfill is the main game element in which the yeartheme is incorporated. With this, the assignments are also related as what the players can collect with the card as well as the locations of the assignments..

With the current yeartheme; wonderful world, the quest was to collect snacks from over the whole world. The locations are countries. For next years' yeartheme, The Future, the quest can be to collect parts of a robot or a flying car. Locations can be anything where parts might be, like the hardware store, the dump or grandpa's basement.

Because the goal is to play the game over and over again and because of the social/emotional measurements, a lot of assignment cards must be available. This also means that a lot of different parts must be able to be collected in the quest. The available amount locations are fixed because of the grid, however, it is possible that different parts can be collected at the same location.

Board game

For the board game version of teQ's adventure, the image on the board is also related to the yeartheme. In order to reduce costs and waste, the image can be placed on the board as a sticker. This means that the board does not have to be changed every year, only a new sticker must be placed.

Life size game

The life size version of the game does not use the board but the floor tiles. Because the tiles are placed in a different layout each time, there is not one big image on the floor tiles. As the locations are not printed on the tiles, to reduce costs, the yeartheme is not shown on the tiles. This means that the tiles do not have to be changed each year.

6.2 Assignments

In the creation of the prototype, it was made sure that there were enough assignments for the players to execute, without having to do assignments twice. Since most user tests were performed with new subjects, assignments could be used in each test.

However, if the game would be used at an afterschool location, the game is supposed the be played multiple times by the same players. In order to keep it fun and keep the measurement reliant, the set of assignments have to be expanded.

In the implementation table of the social/emotional elements in appendix O, an explanation of the structure of the assignments are given for each category. These explanations can be used as a template to make more assignments.

For the categories for which the assignment does not require a specific structure, a variety of assignments can be used. As explained, these type of assignments make the game more fun and a perfect fit for the location. Making use of the space, other people and objects make this fit.

Amount of cards

Thirteen out of 23 social/emotional sub subcategories are measured with type 1 assignments. It is estimated that for a measurement, five measures are required. This results in 65 type 1 assignment cards. Since each assignment is executed by two players instead of four, 130 assignments are required to make the chance as small as possible that assignments have to be executed double.

Using the same calculations, 70 type 2 assignments and 40 type 3 assignments are required. However, since these two assignment types make the game more entertaining and a better fit for the location, the numbers are doubled. This means that in total 350 assignment cards are required.

7. Production

In order for the children to play the game, the game has to be produced. As SWKGroep has 137 afterschool care locations, it is estimated that the game will be produced 150 times.

Printed matter

Most parts of the game are printed matter. SWKGroep does print materials like these themselves, but often work with two companies. It is therefore expected that one of these, or both of these companies will also print the printed matter for the game. For the price indication of the cards, manual and board, one of these companies, Van Deventer, is consulted to make an offer. In the request, it was mentioned that the materials must be able to withstand extensive use that is possible at an afterschool care. For the other materials, other companies were consulted. However, it is possible that Van Deventer is also able to print these. The other companies were also used for a price comparison.

Cards

The cards are standard bridge playing card size (56x88 mm) and are printed on 2-sided sulfate cardboard - FSC Mix, 360 grams. For the finish, the cards are laminated with a glossy finish. The templates for all cards can be found in appendix P.

What	*Total price*	*Price per game*	*Company*
Cards	€1990,00	€13,27	Van Deventer
Cards	€2380,95	€15,87	printenbind.nl

Manual

The manual is an A4 booklet of eight pages, including the cover. The manual will be double sided printed on silk mc - FSC mix, 150 grams paper.

What	*Total price*	*Price per game*	*Company*
Manual	€295,00	€1,97	Van Deventer
Manual	€98,00	€1,32	printenbind.nl

Board

For the board, two options are available, at two different price points. The most aesthetically pleasing version is an A2 board that can be folded into an A4 board. This is possible at Van Deventer. However, for that price, four non foldable boards can be printed at another company. This means that the board would not fit into the A4 box, but it is expected that it can be stored separately at the afterschool care location.

What	*Total price*	*Price per game*	*Company*
Board	€2150,00	€14,33	Van Deventer
Board	€463,50	€3,09	printenbind.nl

Remember card

For the remember card, a more sturdy material was chosen since it will be used and moved extensively during the game. The remember cards have an A5 format and printed on 3,8 ecoboard.

What	*Total price*	*Price per game*	*Company*
Remember card	€68,55	€0,46	printenbind.nl

Obstacles

The obstacles are printed and cut out to contour. However, they are too small to print single obstacles, therefore, two obstacles are put together. They are printed on 350 grams paper.

What	*Total price*	*Price per game*	*Company*
Obstacles	€193,20	€1,29	printenbind.nl

Box

The box holds all game components together and has the dimensions of an A4 paper, 50 mm high. At the selected company, the boxes are bought separately from the stickers that are put on the boxes.

What	*Total price*	*Price per game*	*Company*
Box	€1035,00	€6,90	wingames.be

Stock purchases

Some components are much cheaper to buy in stock instead of producing them yourself. These components are:

- Pawns, in six colours, available at www.dobbelstenenshop.nl
- Cardholders, for the obstacles, available at www.aliexpress.com

Other components

Floor tiles

For the life size version, 25 foam floor tiles are required per game. Three options are available for the production/purchase of the floor tiles, each in a different price group:

Option 1. Printing all tiles

The most aesthetically pleasing but also most expensive option. In this option, all 25 tiles are printed with a custom design. Printing this at Van Slobbe, a Dutch printing company will cost €211,31 per game.

Option 2. Only print required tiles

For the game, only eight tiles require a specific print, namely the obstacles. The other tiles can have any print/color and therefore do not require to be custom printed.

Printing the eight tiles at Van Slobbe will cost €69,70 per game. In order to complete the setup, the seventeen other floor tiles can be bought from stock, at €2,12 per game, from www.aliexpress.com.

Option 3. No custom tiles

By far the cheapest but least fitting option is to only buy stock tiles, at €3,05 per game. This also means that this version does not have obstacles, which would be a loss for the game. Another option is to diy the obstacles since the tiles can easily be painted.

Total price

In total, when selecting the cheapest price that was found, not taking into account discount prices because of large purchase. In the table below, the total price and price per game can be found. As can be seen, are the tiles the most expensive part of the game. This means that for only the board game version, the game would only cost €27,68 per game. This is something to take into account when developing this game further.

What	**Total price**	**Price per game**
Cards	€ 1990,00	€ 13,27
Manual	€ 198,00	€ 1,32
Board	€ 463,50	€ 3,09
Remember card	€ 68,55	€ 0,46
Obstacles	€ 193,20	€ 1,29
Box	€ 1035	€ 6,90
Pawns	€ 56,25	€ 0,38
Cardholders	€ 146,61	€ 0,97
Tiles	€ 10773,00	€ 71,82
Total	***€ 14.924,11***	***€ 99,50***

App

One big expense that is not taken into account in this calculation is the development of the app. App development varies widely in cost and can be very difficult to estimate. However, it is expected that the costs of the app will be limited because it does not require a lot of features, as there is no social media connection required, no purchasing system or GPS connection. Features that do make the app more expensive are the use of the camera and the connection to the cloud, where the collected data is stored so that the pedagogical employee can process it.

8. Evaluation of the game

8.1 Evaluation of the measurement system

The goal of this project was on the one hand to design and create an entertaining game, while on the other hand to also research how and to what extent it is possible to measure the social/emotional development by playing this game.

After prototyping and iterating the game as much as possible within the time available, the next goal was to evaluate the measurement system of the game.

In order to get a good understanding of what the measurement of the social/emotional development entails, two current systems were researched; KIJK! and SEOS. Not only were they used to create the 23 categories that must be measured to be able to draw conclusions, the scoring system was also adopted. The difference lies in who/what scores the statements. In KIJK! and SEOS, the statements are scored by the pedagogical employee or supervisor, while in the game, they are checked by the actions that the players perform.

8.1.1 Evaluation of the reliability and validity

Although the core way of scoring the subjects within the game is thus the same as in current used and validated system, one can still discuss if the outcomes of the measurement in the game are as validate and reliable as with the official systems. In order to judge those, the measurement is compared to that of KIJK!, as this is a validated system. This means that the definition of a high validity in this evaluation is a high similarity between the game and KIJK!. This also results in only focussing on KIJK! in the evaluation and not taking SEOS into consideration. The reason for this is that KIJK! is officially approved and more is known about KIJK! because SWKGroep uses it.

In order to be able to judge the validity and reliability of the game, a few things need to be taken into consideration.

First, an important factor is that the assignments, which are the biggest source of measurement, are created by myself. KIJK! uses observations of real life situations, which makes every situation as true as it can be. However, as I am not a pedagogical expert, it is possible that some assignments are not true measurements of what is supposed to be measured. This is an important factor for the validity. Furthermore, for the reliability, it is possible that some assignments are be misleading or could be misunderstood and therefore are not executed in the same way by all players. This then might result in unreliable data. Although the type of assignments are discussed and consulted with a pedagogical expert and each category is measured through different assignments, this still must be taken into account.

A second factor for the reliability and validity to consider is the fact that within the game, the children estimate their own skills, qualities and/or behaviour. The question therefore is whether this will result in scores similar to those determined by the pedagogical employee with KIJK!.
In order to answer this question, the different ways of measuring within the game have to be split up.

Type 1 assignments

In type 1 assignments, the children have to answer how they would react to certain situations. 13 out of 23 social/emotional categories are measured using these assignments, see paragraph 5.1.1. The questions are structured in such a way that it is expected that the children answer the question truthfully. These answers directly define the outcome of the measurement. However, there are two factors that might influence their answer.
First, it has to be determined whether children of 6-8 years old are capable of estimating their behaviour truthfully. Large scale follow-up research would have to prove this.
Second, the children might be influenced by the game element. Namely that the children are rewarded for giving the same answer and not for giving the true answer. This influence is limited as much as possible with various measures, as explained in paragraph 5.1.

Other ways of measuring

A total of eleven categories are measured with the use of assignment types 2 and 3, situation cards and other methods. In comparison to the measurement using type 1, the relation between the action and the outcome is indirect. This means that the children have less possibilities to influence the outcome consciously.
Furthermore the game element may have a positive influence on the validity of the measurement. Namely, there is a reward for performing well and not for acting different than the player thinks is right.
The methods of collecting data by the game and by the pedagogical employee have a high similarity, namely registering down what actions the children perform, and thus a high validity. This means that the data will also be similar. However, further research must show how big the role of the pedagogical employee is in interpreting actions.

Conclusion

Since the data is always collected in the same way and each player is treated the same, it can be concluded that there is a high reliability. However, the validity of the game can not be granted for 100 percent, as the measurement system is created by myself. However, there is a high level of similarity between the methods of measuring with KIJK! and with the game. Further research however must show the influence of the discussed factors.

8.1.2 Evaluation of the usability of the game as a measurement system

Besides looking at the reliability of the measurement, the usability of the game as a measurement system must also be evaluated.

The current used system, KIJK!, is not used as a decisive system, it is in use as support for the pedagogical employees. The results, based upon of the measurement are used as an indication of the sectors in which a child might need extra guidance. The game can therefore also not be used as a decisive system. It is also not possible to use the game as a stand alone system due to a number of reasons.

Limitations of the measurement with the game

First, out of the 23 social/emotional categories, the game measures 21. The reason for this is that the other two categories, asking for opinion of others and asking how someone is doing, can not be measured within the structure of this game.

Second, some categories are measured for the group instead of for the individuals. This means that the measurement can not give an indication for children separately but only for the group of players. These measurements can still be used to compare children, but then in groups, as some children might act different with some children than with other children.

Third and lastly, children might influence each others' measurement. With part of the measurement of 'Without initiative nothing happens', the child that scans his card first is measured. However, it is not known whether the other children took initiative or not, which thus influences their measurement.

Potential of the game

However, despite the limitations of the measurement with the game, the game also shows a great potential to be a valuable addition for a number of reasons.

First, the game always measures in the same way, which makes the game a consistent tool for measurement. As KIJK! relies on interpretations by a person, emotions or misinterpretations might influence the measurement.

Second, the game may be used as an extra source of data collection. As the game and KIJK! roughly measure the same qualities, the two systems can be used to improve each other. After the validity and reliability are confirmed, differences in outcomes of the two systems might lead to further research to these outcomes. Another possibility is that the measurement from the game shows some shortcomings of KIJK!.

Third, the game does not require a specific location, time or presence of the pedagogical employee. This means that the measurement can take place at any moment.

Fourth, multiple measurements can take place at once, as the pedagogical employee is still available to observe the children for KIJK!.

Fifth, the game can be used to perform 'extra' measurements. In case the pedagogical employee may need some extra data from a child on a specific category, he/she can use the measurement in the game to measure this category specifically at any time. By only using KIJK!, situations have to be created in real life, which might make them forced and unreliable if not thought through well.

The final potential of the game is the marketing for SWKGroep. One of their key values is to help children develop. With this game, they can show that even in the creation of an entertaining game for children, they work on this development. However, for the game to be used as marketing, the validity and reliability of the game must be confirmed.

Conclusion

The game has three big limitations when it comes to the measurement system; the absence of two of the categories, some combined group measurement and influence of players on part of the measurement. This results in the inability to use the game as a stand alone measurement system. However, it does show great potential to be a valuable addition to KIJK! in multiple areas; a consistent measurement, potential for KIJK! improvement, no required location, time or presence of the pedagogical employee and therefore also possibility to measure more children at once, as well as the possibility for the pedagogical employee to measure specific categories, which is not possible with KIJK!. At last, the game can be a great marketing tool for SWKGroep.

8.2 Evaluation of the entertainment level

The main goal of this project was to design and create an entertaining game for 6-8 year old children at afterschool care. Therefore, it is a logical step to not only evaluate the measurement system but also the entertainment level of the game.

Unfortunately, due to COVID-19, it was not possible to test the game at an afterschool care location. However, it was possible to test the game at a primary school, with 6-8 years old children. Because of the similarities in locations; being with multiple children, having a supervisor that is not a parent and not being at home, it is not expected that this has a big influence on the outcome of the entertainment level of the children.

During the testing period, a full class of 24 children have played the game, some once, some twice. Each testing day, one or two groups of four children were able to play. In order to 'choose' children, first, the children were free to say whether they wanted to test or not, without any consequences. Next, out of the children that wanted to play, random children were picked with the use of folded paper in a bowl.

A few factors and testr esults can be taken into consideration when evaluating the entertainment level of the game;

First, except for the first time, all children wanted to play the game each time. Children who had already played, wanted to play again and told about the game to the other children, which made that the new players also wanted to play. The children that did not want to play the first time were later on convinced by their classmates.

Second, the children said multiple times during and after the game that they really liked it. In order to make the children feel comfortable to share their honest opinion, they were instructed by their teacher. She told them that only their honest opinion would help me make the game even more fun. During the game, it became clear that the children felt comfortable as they shared multiple times what they liked, but also elements that they found difficult.

Third, because of the enthusiasm and lack of time, it was not always possible to ask the children extensive questions about what they thought about the game, other than 'Fun!', 'Really nice!' and 'Best time ever'.

Fourth, although the children did not know me before this project, I was a special guest in their classroom. Their teacher is my mother, which makes it very exciting for the children that I was there. This might have influenced their opinion.

Fifth, the game is only played by four children at a time. Although the game was designed for up to six players, due to lack of space at the testing location, it was not possible to test with six children. This might influence the gameplay and thus the entertainment level. The choice was made for six children because children at the afterschool care showed to often play with five or six children. Although it is not expected to have a big influence, further testing must proof this for the entertainment level. On the other hand the game can also be changed to a game for four players maximum.

Sixth, during the testing, I was always present. In order to observe the testing and being able to explain some misunderstandings, it was necessary for me to be present during the testing. This might have influenced the gameplay and thus the opinion of the children.

Seventh, the game was played by the children twice as a maximum. This means that it is not known how entertaining the game is to play multiple times in the long term. There are some elements included in the game to make it more entertaining over a longer period of time (eg. obstacles, placement cards, situation cards) however, further research must show if the game is actually entertaining to play multiple times.

Conclusion

The overall opinion of the children who played the game was very positive and they were enthusiastic to play the game again. However, there are a few factors (me being the daughter of, four players instead of six, my presence) that might have had an influence on their opinion. It is not expected that these factors influence the game as much that it would not be entertaining without them, but further research must show their influence.

9. Recommendations

Although the game has been designed and iterated to the best version that was possible in the given time frame, there are still some recommendations for further improvements. These can be divided into two segments; the measurement system of the game and the entertainment level.

9.1 Measurement system

Validity

One important part of the measurement system within the game is the validity of this measurement. Because of the new implementation of the measurement, further research must show whether this way of measuring generates the same results as with the current used system. This research must be executed by comparing the outcomes of a big group of children both for the game and the current used system.

Furthermore, the validity has been stated to be high if it has a high similarity with KIJK!. Although KIJK! is an official and validated system, it is not known whether this is the perfect system.

Missing categories

As explained, it was not possible to include all 23 sub subcategories in the current design of the game as two are missing. Further research must show if there are other ways to include the measurement of these categories in the game to complete the measurement.

9.2 Entertainment level

Long term entertainment

The game has been tested with a total of 24 children. These tests were mainly focused on the understandability of the game. Since the children have played the game a maximum of two times, the entertainment level of the game for the long term could not be tested. By letting children play the game multiple times over a longer period, it will be possible to conclude whether the game is entertaining to play for multiple times or that components have to be added/changed to guarantee this.

Life size game

Due to the available space and time, it was chosen to focus on the board game version of teQ's adventure in this design project. Therefore, the life size version has only been tested once, with the first version of the game. Further testing with the life size version must show whether other changes have to be made to make the gameplay work.

More players

As explained, the game was tested with groups of four children. However, the game was intended to be played by up to six players. Although it is not expected to have a big influence, this must be tested in order to know whether the game and the measurement also works for up to six players.

9.3 Application

In order to complete the measurement system and be able to test the system on a large scale, the application has to be developed. As SWKGroep does not have experience with app development, it is recommended that they hire an app developer/company for this. However, because all functionalities and steps are known, and SWKGroep is able to design everything themselves, it is expected that this will not be a lot of work.

10. Conclusion

In the beginning of this thesis, the following assignment was setup:

Design, prototype and test an entertaining, physical game for SWKGroep that will be used at their afterschool care locations, and explore how and to what extent it is possible to measure the development of the children with the use of the game.

Before the creation of the game could start, four sub researchquestions had to be answered;

1. What context factors of the afterschool care influence the game?
Observations and interviews have shown that two factors regarding the afterschool location are a. the size of the group of children and b. the large amount of space available. Another factor, regarding the measurement in the game, is the fact that the pedagogical employees do not have enough time to execute the measurement. This had a big influence on the design of the game.

2. What age group shows the most potential for the measurement of their development in a game?
From the total available age group of 0-12 year olds at afterschool care, 6-8 year olds show the most potential because of the rapid development children go through at that age. This age group is also the largest age group at SWKGroep.

3. What developmental domain shows the most potential to be measured with a game for the chosen age group and how to measure this?
Out of the four developmental domains, the social/emotional domain shows the most potential because of the fit with the key values of SWKGroep and the fact that this domain currently is monitored the least in children.
By combining two current used systems for the measurement of the social/emotional development, KIJK! and SEOS, a full overview of the domain was created in the shape of 4 categories, 11 subcategories and 23 sub subcategories.

4. How to design a game and what do games consist of?
Using the Cookbook for persuasive design, it was known to start game design with the main game elements. By analyzing ten popular games for game elements, an overview of possible game elements were created, which were then used in the ideation process. Beside this analysis, the games were also analysed for the presence of the predetermined social/emotional categories.This showed that most categories were not present.

Based on the answers to these sub research questions and on two game analysis available, the next step was to tackle the project assignment.

*Design, prototype and test an **entertaining,** physical game for SWKGroep that will be used at their afterschool care locations,*

Through the process of ideating, testing, conceptualization and testing again, the first version of the final game was created; teQ's adventure. Through a total of nine user tests and six iterations, the final version came to be. With the user tests, the entertainment level and the understandability of the game where improved and secured. The evaluation of the entertainment level of the game showed a positive entertainment level.

and explore how [it is possible to measure the development of the children with the use of the game]

By using the same scoring system as in the currently used systems, KIJK! and SEOS, the game is able to measure the different social/emotional categories. The biggest difference is that in the current systems a supervisor scores the statements, whereas in the game, the scores are determined by the actions and decisions of the players.

and to what extent it is possible to measure the development of the children with the use of the game.

It turned out that 21 out of all 23 subcategories could be included within the game. The 2 exceptions are: asking for opinion and asking how someone is doing. Out of the 21 included subcategories, three were limited to measuring for all players combined, instead of each player individually.
The measurement system has a high similarity with the current way of measuring, which results in a high validity. However, because the implementation is new, further research must confirm the validity. The measurement has a high reliability because of the consistent way of measuring.

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12. Appendices

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A. Design brief

Personal Project Brief - IDE Master Graduation

TU Delft

Designing a fun game for children at child care to measure development — project title

Please state the title of your graduation project (above) and the start date and end date (below). Keep the title compact and simple. Do not use abbreviations. The remainder of this document allows you to define and clarify your graduation project.

start date 19 - 02 - 2020 — 28 - 07 - 2020 end date

INTRODUCTION **

Please describe, the context of your project, and address the main stakeholders (interests) within this context in a concise yet complete manner. Who are involved, what do they value and how do they currently operate within the given context? What are the main opportunities and limitations you are currently aware of (cultural- and social norms, resources (time, money,...), technology, ...).

The Play Well lab at the TU Delft faculty of Industrial Design Engineering has partnered with SWKGroep with the goal to gather knowledge and apply this in designs that improve the quality of SWKGroep.

SWKGroep is an umbrella organization that provides child care, extra care for special children and community work. They offer child care to 25.000 children from 0 to 13 years old in The Netherlands, divided over 250 locations. Each year, SWKGroep works with a year theme, for 2020 this is 'Wonderful world'. This theme is used to form their activities around and for the children to explore.
SWKGroep wants to keep innovating and show themselves to the outside world. They do this by expanding their portfolio. Next to publishing books, SWKGroep has a wish to create and release a new product with their year themes: a physical game for the children to play with at child care.

Two big goals of SWKGroep are:
1. SWKGroep wants to improve the quality of child care.
They make this possible by using their Pedagogical expertise center to use one efficient approach to the children. SWKGroep publishes books for children with fun activities around the year themes. For the parents, the books include the pedagogical theory behind these activities. With these books, SWKGroep distinguishes themselves for not only using knowledge in practice, but also sharing theory.

2. SWKGroep wants to support the development of children.
Therefor, they provide not only fun at child care, but also focus on the development of different skills in their activities. In addition to supporting the development, can measuring the development have two major advantages; 1) SWKGroep can use the results to show the outside world their work and quality. 2) If skills show not to be developed enough for the group or for certain individuals, the results can be used to improve the skill stimulating activities to help the children develop.

On the next page, a visualization of the stakeholders and their wishes in the game design wish can be found. The wishes are assumed, based on my own previous experience with children and child care employees, and therefor have to be confirmed by research.
The smaller the circle and the closer to the center, the more important the stakeholder.
The main stakeholder is the children since the game will be designed for them. The next layer of stakeholders are SWKGroep, TUDelft and myself since we shape the assignment and design around the wishes and needs of the children. The final layer are the parents and employees since they will provide important knowledge and insights but will not influence the design process directly.

introduction (continued): space for images

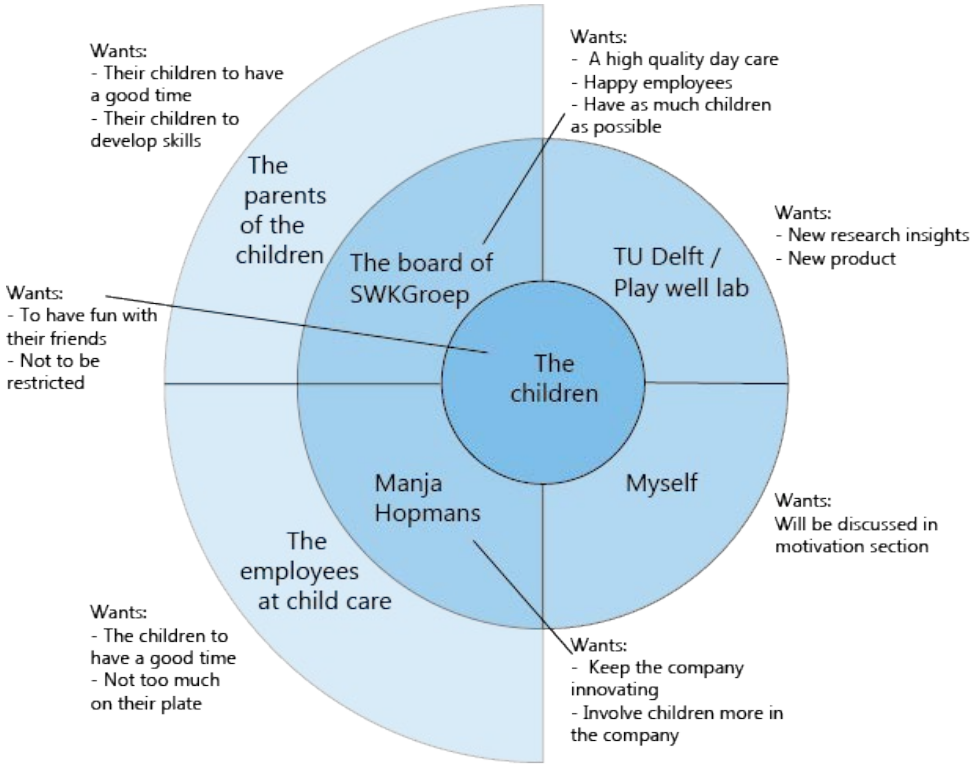


image / figure 1: Stakeholders and their wishes

image / figure 2:

PROBLEM DEFINITION **

Limit and define the scope and solution space of your project to one that is manageable within one Master Graduation Project of 30 EC (= 20 full time weeks or 100 working days) and clearly indicate what issue(s) should be addressed in this project.

When designing a game for children, there is a big challenge in designing a successful game; something that is fun to play multiple times. For this to be the case, different issues have to be researched when designing the game:
- Which age group fits the wish and possibilities best. SWKGroep offers child care to children from 0 - 12 years old. It is impossible to design a game that will be fun for this entire age group.
- What the interest of this age group is.
- What makes a game fun.
- What keeps a game fun.

An opportunity for the game is to incorporate the measurement of skill development, as the advantages were mentioned before. This creates a double function for the game:
- Let the children play, and interact with the year theme
- Let SWKGroep learn about children's development

With this opportunity, new issues have to be researched:
- Which type of development is most valuable to measure. Children develop in five different development areas (cognitive, social, speech and language and fine/gross motor). It is impossible to measure all these areas at the same time.
- The way in which the development can be measured. The game can either measure on itself, or can be used as a tool to for the employees of SWKGroep to be used to observe and measure development.
- How and to what extent it is possible to assess development in a game that children can and want to play multiple times.

ASSIGNMENT **

State in 2 or 3 sentences what you are going to research, design, create and / or generate, that will solve (part of) the issue(s) pointed out in "problem definition". Then illustrate this assignment by indicating what kind of solution you expect and / or aim to deliver, for instance: a product, a product-service combination, a strategy illustrated through product or product-service combination ideas, ... In case of a Specialisation and/or Annotation, make sure the assignment reflects this/these.

I am going to design, test and prototype an entertaining, physical game for SWKGroep, that is customizable to their year themes and will be used at their child care locations, and explore how and to what extent it is possible to measure the development of the children with the use of the game.

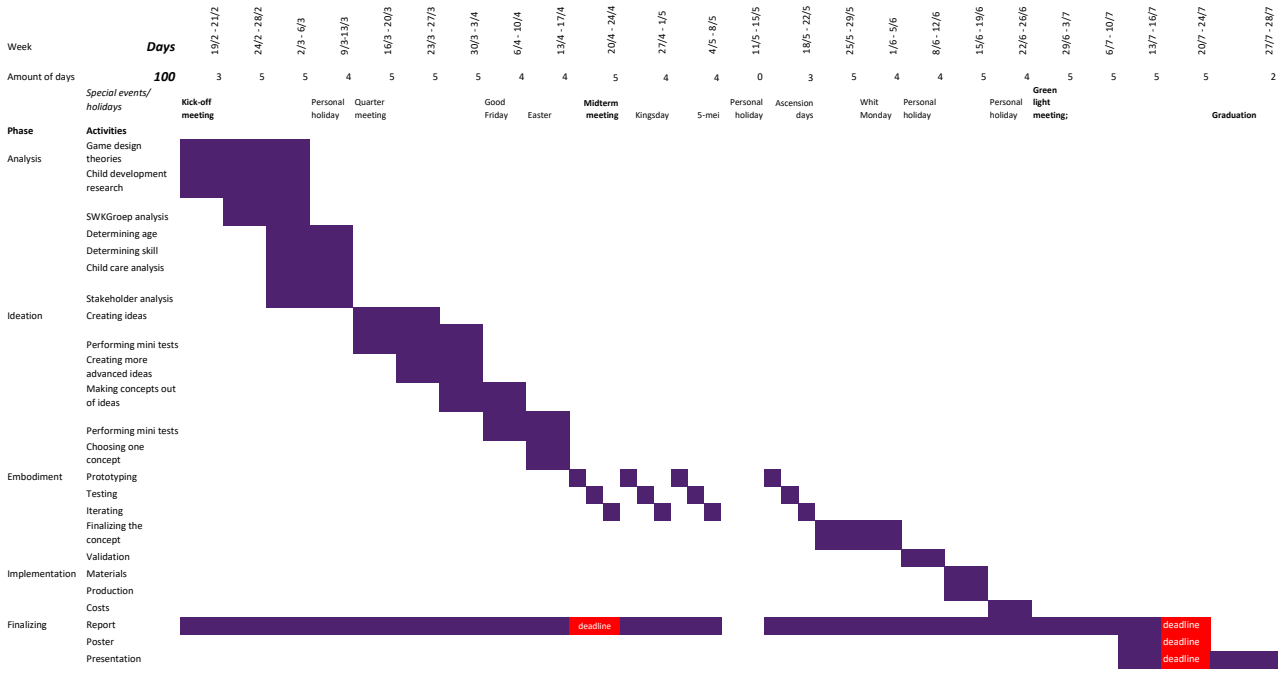
As I am an IPD student, my main focus in designing lies on the ideation and embodiment phases. However, before I can start these phases, I will execute background research in the analysis phase. The main research will be on game design for children. With the help of literature, child care observations and interviews with stakeholders I will decide on an age group that fits the wish of SWKGroep of an entertaining game and monitoring development.
Following the opportunity to include skill development measuring, I will decide on the type of skill development. In the ideation and embodiment phase, it will become clear to what extent it is possible to design an exhilarating game that also measures the skill development. This will be researched through testing and iteration of ideas.

Furthermore, I want to make quick prototypes to be able to test them with the children and iterate as much as possible to come to both a functioning and appearance complete prototype.

PLANNING AND APPROACH **

Include a Gantt Chart (replace the example below - more examples can be found in Manual 2) that shows the different phases of your project, deliverables you have in mind, meetings, and how you plan to spend your time. Please note that all activities should fit within the given net time of 30 EC = 20 full time weeks or 100 working days, and your planning should include a kick-off meeting, mid-term meeting, green light meeting and graduation ceremony. Illustrate your Gantt Chart by, for instance, explaining your approach, and please indicate periods of part-time activities and/or periods of not spending time on your graduation project, if any, for instance because of holidays or parallel activities.

start date 19 - 2 - 2020 28 - 7 - 2020 end date



Because of several holidays, the 100 workdays are divided over a period of 24 weeks. An 'easier to read' version can be found at the end of this document.

Initials & Name M.S. Pieters Student number 4459083

Title of Project Designing a fun game for children at child care to measure development

MOTIVATION AND PERSONAL AMBITIONS

Explain why you set up this project, what competences you want to prove and learn. For example: acquired competences from your MSc programme, the elective semester, extra-curricular activities (etc.) and point out the competences you have yet developed. Optionally, describe which personal learning ambitions you explicitly want to address in this project, on top of the learning objectives of the Graduation Project, such as: in depth knowledge a on specific subject, broadening your competences or experimenting with a specific tool and/or methodology, ... Stick to no more than five ambitions.

Although I have successfully completed a lot of design assignments up to this point, most of them were group work. Therefore, my biggest goal in my graduation is to show myself that I can design and prototype a valuable and unique product by myself to increase my self-confidence in my design skills.

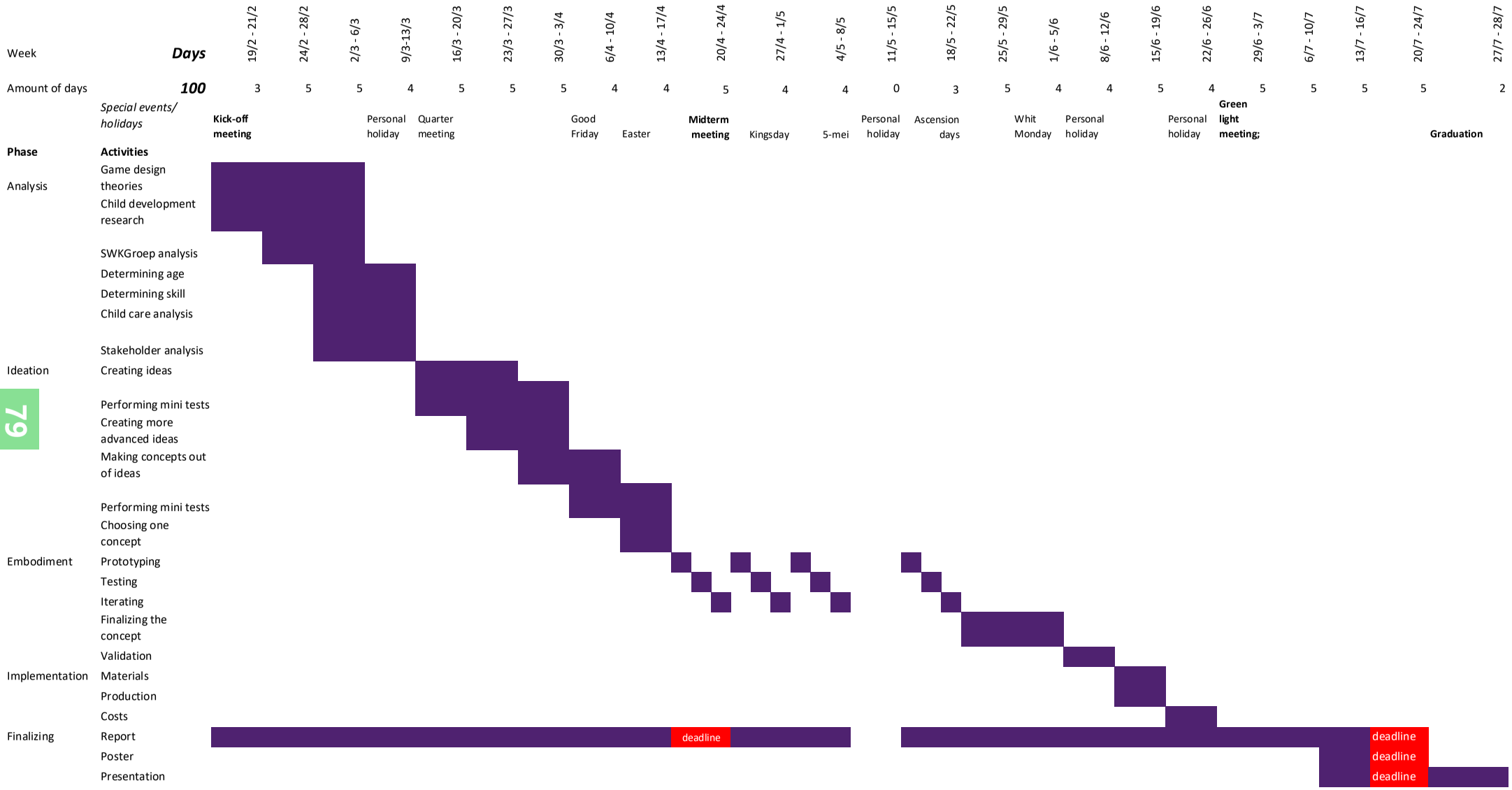
I have a big interest in the development of children as I think it is fascinating how easily children can learn and develop. Besides this, I really like to play games and also see a lot of potential in games and play to use it for more than just to have fun. In my bachelor final product I got the opportunity to explore this a bit by creating a toy for people with a severe mental disability that arouses their brains. Now for my masters graduation, I would like to take this a step further by trying to combine my interests in a both fun and functional game.

Besides designing, I would like to use this graduation to learn more about the theory of children and their development and to learn more about game design. I have learned a bit about both subjects in previous courses, however, because of restricted time and the assignment, I know I can expand my knowledge and experience with both.

With the gained knowledge, experience and design, I would like to use them as a stepping stone in my future career where I would love to design for children and or design games.

FINAL COMMENTS

In case your project brief needs final comments, please add any information you think is relevant.


Week
Days
19/2 - 21/2
24/2 - 28/2
2/3 - 6/3
9/3-13/3
16/3 - 20/3
23/3 - 27/3
30/3 - 3/4
6/4 - 10/4
13/4 - 17/4
20/4 - 24/4
27/4 - 1/5
4/5 - 8/5
11/5 - 15/5
18/5 - 22/5
25/5 - 29/5
1/6 - 5/6
8/6 - 12/6
15/6 - 19/6
22/6 - 26/6
29/6 - 3/7
6/7 - 10/7
13/7 - 16/7
20/7 - 24/7
27/7 - 28/7
Amount of days
100
3 5 5 4 5 5 5 4 4 5 4 4 0 3 5 4 4 5 4 5 5 5 5 2
Special events/ holidays
Kick-off meeting
Personal holiday
Quarter meeting
Good Friday
Easter
Midterm meeting
Kingsday
5-mei
Personal holiday
Ascension days
Whit Monday
Personal holiday
Personal holiday
Green light meeting;
Graduation
Phase
Activities
Analysis
Game design theories
Child development research
SWKGroep analysis
Determining age
Determining skill
Child care analysis
Stakeholder analysis
Ideation
Creating ideas
Performing mini tests
Creating more advanced ideas
Making concepts out of ideas
Performing mini tests
Choosing one concept
Embodiment
Prototyping
Testing
Iterating
Finalizing the concept
Validation
Implementation
Materials
Production
Costs
Finalizing
Report
Poster
Presentation
deadline
deadline
deadline
deadline

B. Explanation of portfolio analysis

Events/activities

1. Wereldhavendagen Playground
SWKGroep organized entertainment for the children at World Harbour Days 2019 with activities on the square.

2. SWKGroep schaaktoernooi
Following the year theme 'Body & Brains', SWKGroep organized a chess contest for all their children.

3. SWKGroep innovatieprijs
Following the year theme 'Techniek', SWKGroep organized an innovation contest for their children to come up with innovative ideas to protect the world.

4. SWKGroep Goede Doelen Golftoernooi
To collect money for charity, SWKGroep hosts a yearly golf tournament for partners.

5. Boss of tomorrow
Jinc, a company that supports children in their future career, organizes a yearly event where children get a chance to be the boss of a company for a day. SWKGroep joined this event.

6. Kinderhulp
Kinderhulp is an organization that helps children who do not have much money to spend. To help Kinderhulp, all Air Miles that are collected from the groceries of child care locations from SWKGroep go to Kinderhulp.

7. SWKGroepPas
All employees and children of SWKGroep have a pass with which they get a discount at specific activities/stores. With this pass, SWKGroep is able to collect data of their customers about their interests.

Books

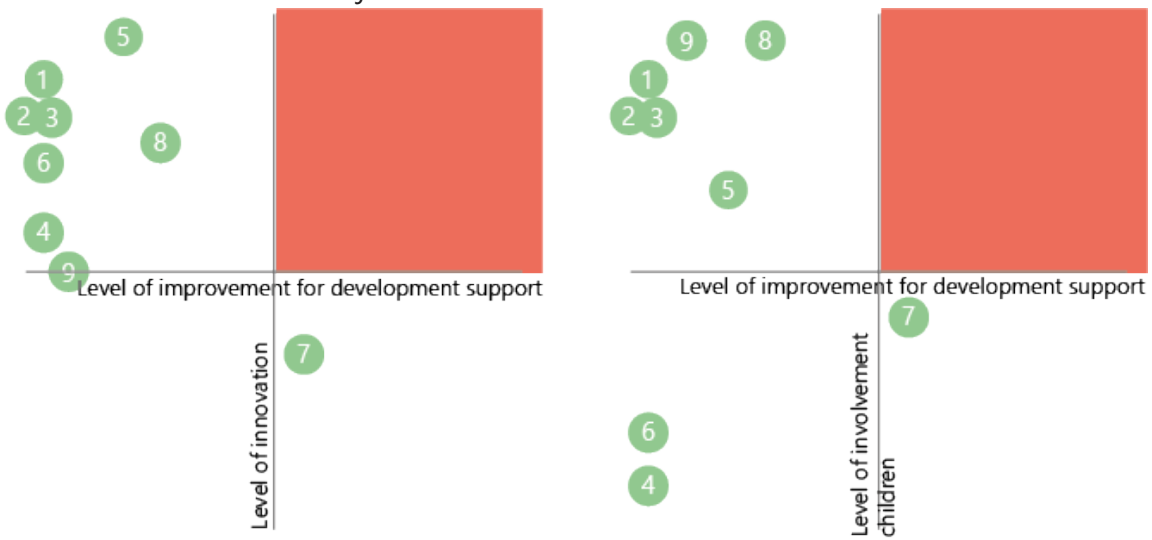
8. Year theme books
Every year, when a new year theme is introduced, SWKGroep publishes a new book full of activities for the children to do.

Year themes:

Wondere wereld	1 juli 2019 - 31 december 2020
Body & Brains	juli 2018 - juli 2019
Water	juli 2017 - juli 2018
Techniek	juli 2016 - juli 2017
Kunst & Expressie	juli 2015 - juli 2016
Sport & Bewegen	juli 2014 - juli 2015
Natuur	juli 2013 - juli 2014

9. Additional books
In addition to the activity books, some year themes have additional books.

Hockey spelregelboekje
Kunst & expressie verhalenbundel
Natuurlijk eten kookboek
Schaken doe je zo



C. Explanation of social/emotional categories

Ego development

Independence

Independence has to do with whether the child is able to make his/her own choices, takes initiative and solves a problem himself.

Subsubcategories:

- Without initiative nothing happens
- Problem solving

Self confidence

Whether a child is self confidence has to do with the self knowledge - knowing good and less good qualities of yourself and thus being able to ask for help if necessary. Having an own opinion an daring to express this also has to do with self-confidence.

Subsubcategories:

- Knowing own qualities
- Asking for help

Social development

Interaction with others

Interaction with others has everything to do with the relationship between the child and other people; taking initiative to contact others and sharing experiences with each other.

Subsubcategories:

- Contacting other people
- Sharing experiences

Dealing with authority

It is important that children can acknowledge and respect authority, no matter whether it is a parent, a teacher or another child that provides gameplay.

Subsubcategories:

- Having respect for authority

Interest in others

Interest in others is not only asking how someone is doing, but also asking for their opinion.

Subsubcategories:

- Asking for opinion of others
- Asking how someone else is doing

Taking others into account

Taking others into account has different levels; involving people in activities, taking care of someone in need, taking into account the skill level of others and sharing your own stuff.

Subsubcategories:

- Involving others in activities
- Helping others
- Choosing difficulty based on skills

Emotion regulation

Dealing with conflicts

Being able to express yourself and why you handled in a way in a conflict is very important. But also moving past the negative emotions or preventing conflicts are elements of dealing with them.

Subsubcategories:

- Explaining your actions
- Making up with people
- Making concessions

Keeping things with yourself

Sometimes not everything needs to be shared, like emotions or a secret.

Subsubcategories:

- Keeping a secret
- Keeping an emotion for yourself

Affect differentiation

Insecurity

Being insecure and ashamed of things you did or didn't do is very common with children. Also needing acceptance and seeking contact with trusted people.

Resisting

Some children are very resistant towards the outside world and can therefore be mean or make fun of others.

Moral development

Right and wrong from your own point of view

This category is about recognizing unfair treatment both when it is happening to you as when you are doing it and showing that you know that it was wrong and apologizing.

Subsubcategories:

- Recognizing unfair treatment
- Treating someone unfair and apologizing

Right and wrong for others

This category is about recognizing when other people are treated right or wrong, and also standing up for people who are treated wrong. But also understanding the reasons why people might do wrong things and being able to advice people on right and wrong actions.

Subsubcategories:

- Recognizing unfair treatment
- Standing up for someone
- Understanding why someone did something wrong

Abiding rules

Rules come in different shapes and sizes, but must all be abided, no matter who they come from and if you are being checked or not.

Subsubcategories:

- Following the rules

D. Game analysis for general elements

	Qwixx	**Hanabi**
Components	Dices, scoresheet	Cards
Environment	Dice	Card
Goals	Points	Points
Game mechanics	Roll dices, select tactic	Interact with team, play cards
Players	Everyone separate	All vs game
	Monopoly	**Concept Kids**
Components	Characters, dices, tokens	Cards, tokens
Environment	Board	Board
Goals	Survive	Points
Game mechanics	Roll dices, move, place	Place tokens, interact with team
Players	Everyone separate	Teams
	Uno	**Twister**
Components	Cards	Spinning pointer
Environment	Card	Active
Goals	Discard cards	Survive
Game mechanics	Play cards	Balance
Players	Everyone separate	Everyone separate
	No thank you, evil!	**Whispering game**
Components	Board, tokens, book	
Environment	Roleplaying	Conversation game
Goals	Achieve assignment	Finish assignment
Game mechanics	Roll dice, decide on action	Talk
Players	All vs game	All vs game

	Tic tac toe	**Rush hour**
Components	Paper, writing material	Cars, cards
Environment	Paper based	Puzzle
Goals	Make combination	Solve
Game mechanics	Draw	Solve puzzle
Players	Everyone separate	All vs game

The full lists per element

Components

The ten analyzed games created the following list:

- Cards
- Die
- Board
- Paper
- Tokens
- Characters
- Game specific objects

Environment (game type)

Since the selected games for the analysis are based on a complete list of game types, this list is also used here. The list however was filtered for relevancy for this game, since the assignment determined that the game must be physical instead of digital(ly supported). The final list consists of:

- Role playing
- Puzzles
- Active game
- Board games
- Card games
- Paper-based games
- Dice games
- Conversation game

Goals
A total of twelve different goals for games were determined:
- Get rid of cards
- Collect cards
- Collect tokens
- Collect points
- Survive
- Arrive at end position
- Create combinations
- Guess clue
- Defeat enemies
- Solve puzzle
- Complete assignment
- Remove other players from the game

Game mechanics (player actions)
Although the ten analyzed games consist of a variety of player actions, it was noticed from other game knowledge that the list was incomplete and therefore complemented with other actions.
- Draw card
- Draw
- Note
- Balance
- Discard
- Hide/find
- Roll dice
- Move token
- Move (player)
- Play card
- Guess
- Build
- Count
- Bluff
- Discuss
- Ask/answer
- Act
- Puzzle/think
- Explain

End of the game
Although most games end when a player reaches the goal, this is not always the case and is therefore listed separately.
- Assignment achieved
- Collected specific tokens/cards
- Collected everything
- Points achieved
- Out of assignment
- Out of time
- Get rid of everything
- Last man standing

Players (relation between the players)
Four types of player relationships during the game were determined from the analysis:
- Everyone vs everyone
- All vs 1
- All vs game
- Teams vs Teams

E. Game analysis for social/emotional categories

	Qwixx	Hanabi	Uno	Twister	Rush hour
Ego development					
Independence	Player must choose which number to cross off, this has direct influence on the rest of his game. Problems do not really occur.	Hanabi is about teamplay and helping eachother, indepency is thus not required.	The player must choose which card to play, however, only a few options are available and are not really influencing the game that much. Problems do not really occur.	The player is not really allowed to make choices and can not take initiative since another player tells him what to do. The only problem that can occur is losing your balance, but other than falling on the ground and losing the game, this problem can not be solved.	This game is about problem solving and making the right choices to do so. Choices you make have a direct influence on the game. When played together, players must take initiative to solve the puzzle.
Self confidence	Qwixx does not have anything to do with self confidence as luck plays a big roll in this game.	Since your teammates give you hints about the cards that you have, you need some confidence in your memory skills in order to do well.	Uno does not have anything to do with self confidence, as it requires a lot of luck.	Players must stand in a position that they feel comfortable in, therefore, they must know beforehand what their strengths and weaknesses are. However, helping eachother and/or having an opinion does not have anything to do with this game.	Players can choose between different levels; only a player who knows that he is good at spatial awareness would choose this level. Asking for help is always an option.
Social development					
Interaction with others	Although the actions of one player can have an influence on the game of another player, this game can be played without any communication so there is no interaction with others.	The communication between the players is key in this game as this is the only way to know which card to play.	Although the actions of one player can have an influence on the game of another player, this game can be played without any communication so there is no interaction with others.	Although players influence each other, there is no need for any interaction and the game can also be played by one player.	When played with multiple people, interaction is required as they have to work together. However, this game is often played by one player.
Dealing with authority	There is no form of authority in this game, other than maybe the rules.	There is no form of authority in this game, other than maybe the rules.	There is no form of authority in this game, other than maybe the rules.	In Twister, one player says what the others should do, so this could be seen as authority as this player is also the judge. However, this player only makes decisions based on facts so it is not really the case.	There is no form of authority in this game, other than maybe the rules.

	Qwixx	Hanabi	Uno	Twister	Rush hour
Interest in others	Players might ask eachother how they are doing in the game, but more for the purposes of comparison than being interested in eachother.	As every player works together, there is no need to ask how someone else is doing. Asking for opinions is not a possibility since that is not allowed in the game.	Uno does not require/ stimulate any interest in eachother.	Players might ask eachother how they are doing in terms of balance, but more for the purposes of comparison than being interested in eachother.	As this game is mostly played by only one person, there is no possibility to be interested in eachother.
Taking others into account	As luck plays a big role in this game, players can not take eachother into account that much.	Players only have a limited frame of communicating, other than that there is no help or other activities possible, which makes it not possible to take eachother into account.	As players do not know what cards other players have, they can not take eachother into account or help eachother.	As the difficulty is decided by an uncontrollable thing, players can not take eachother into account as much.	As this game is mostly played by only one person, there is no possibility to take eachother into account.
Emotion regulation					
Dealing with conflicts	As this game is played individually, there are no conflicts in this game.	Since players have to work together in this game, conflicts can occur if this is not done fairly.	Since part of UNO is counteracting each other, this could raise some conflicts which players have to deal with.	Players can have some conflict or disagreement if someone falls, or with the person that controls the pointer, but this is not a part of the game.	As this game is played individually, there are no conflicts in this game.
Keeping things with yourself	All information is shared in this game	The thing of this game is that players have to communicate which cards a player has, so there are secrets, but that is the game.	Players must be able to keep a pokerface when they almost have finished all their cards in order to not give away which card he has.	All information is shared in this game	All information is shared in this game
Moral development					
All three	If all goes well, players do not treat eachother wrong or abide the rules. Every game allows some cheating, but this is not a part of the game.				

	Monopoly	Concept Kids	No thank you, evil!	Whispering game	Tic tac toe
Ego development					
Independence	Players must choose whether to buy streets or not and therefore what kind of player they are: attacking or defencing. Initiative only is required in trading cards and the problems that occur can only be solved in one way that the game has provided.	Concept is about team play, so it is not prefered that players make choices on their own. However, when guessing, the first to shout wins an extra point for the team, so initiative is required here.	Although the players work as a team, each player must individually choose what actions to take and must take initiative to move on in the game. The actions usually require some problem solving, which has to be done with the character.	Only the first person, who comes up with the word/ sentence to whisper, has some choice making to do. For the rest of the game, this game does not require/stimulate independence.	This game does require some choice making and minor problem solving, however, since there are only a few options and gameplays available, it is not worth mentioning.
Self confidence	Luck plays a big roll in monopoly, and thus knowing what you are good at is not going to help you much in this game.	Players who are good with words or visual thinking will probably be better in this game and thus be more confident in their answers. Having an opinion can be useful in misunderstandigs, however, this is not a required part of the game.	Players have to make choices based on qualities, however, qualities of their characters, but they can be based on the player himself. Asking for help is a big part of this game as this is the only way to go through the game.	Listening and whispering are qualities that are necessary for this game, however, these are also the only options and the game can not be changed, so there is no self confidence present in this game.	A person who has played this game many times will know the way to always win the game, however, other ways of self confidence are not present.
Social development					
Interaction with others	During the game, the players have to contact eachother to get their money and make trades. They however do not have to share other experiences.	As the players have to work together, and come to one level of communicating, it is likely that they will use shared experiences to do this.	Since the players have to work together and make decisions together, they have to interact with eachother. There however is no need to share experiences.	The core of this game is to interact with eachother. Players might choose to use something they experienced to use as the sentence to whisper.	Although there is some interaction, it is not required to talk, or even be in the same room at the same time.
Dealing with authority	The player who is the bank can be seen as authority. However, the decisions that this player makes are not determinative, as this role can easily be replaced by another player.	There is no form of authority in this game, other than maybe the rules.	As one player is the guide and decides the difficulty and the gameflow, the players must respect his decisions in order to be able to play the game.	There is no form of authority in this game, other than maybe the rules.	There is no form of authority in this game, other than maybe the rules.

	Monopoly	**Concept Kids**	**No thank you, evil!**	**Whispering game**	**Tic tac toe**
Interest in others	Players might ask eachother how they are doing in the game, but more for the purposes of comparison than being interested in eachother.	The players that work together do not have to show interest since they know how they are doing. In between teams, players might ask eachother how they are doing in the game, but more for the purposes of comparison than being interested in eachother.	Players have to work together, so much decide together what to do. Asking for eachothers opinion is stimulated here since each player has different qualities so not every player will be able to do everything in the same way.	Talking about other things than the whispering in the game would interrupt the game, which is why there is no interest in other players wanted.	All players can see how both players are doing, there is no need for extra communication.
Taking others into account	Since in Monopoly if a player runs out of money, he can not longer play the game and this is not fun, players can decide to help players to extend the game play.	In concept, players must give clues that all players can understand. Therefore, the clues must not be too difficult or terms can not be used that players might not know. The difficulty of the word to guess can also be chosen according to the skill level of others.	As said before, players must take eachother into account in this game in order to play since not every player can do the same things but must all move on.	There is only one action which has to be performed by all players, so players do not have to take eachother in account in any way.	Tic tac toe is too short to take the other player into account. Also, there is just a limited amount of possibilities.
Emotion regulation					
Dealing with conflicts	Monopoly is a game known to create a lot of tension and conflicts. However, this has more to do with the personality of the players than with the game.	Since players have to work together in this game, conflicts can occur if this is not done fairly.	Since players have to work together in this game, conflicts can occur if this is not done fairly.	The fun of this game is that it most of the time does not go well. Fanatic players might become frustrated by this, but this is not a core of the game.	As this game is played individually, there are no conflicts in this game.
Keeping things with yourself	All information is shared in this game	The key of this game is to guess the information without sharing it.	The game host must keep specific things a secret, but can also choose to help or guide the players into a certain direction.	All information is shared in this game	All information is shared in this game
Moral development					
All three	If all goes well, players do not treat eachother wrong or abide the rules. Every game allows some cheating, but this is not a part of the game.				

F. Requirements

#	Requirement	Source
1	The year theme must be included in the game.	Pedagogical employees
2	The game must be adjustable to a new yeartheme every year.	Pedagogical employees
3	The game must measure the development without actions of the pedagogical employee.	Pedagogical employees & SWKGroep
4	The game must be playable within 60 min.	Location analysis
5	The game must be playable in a space of 8x6 m to fit inside.	Location analysis
6	The game must be designed for 6-8 year old children	Children analysis
7	The game must be playable with groups of 2-6 children	Children analysis
8	Winning does not have to be the game goal	Children analysis
9	The game must trigger the children to keep being concentrated	Children analysis
10	The game must be fun and attractive	Children analysis
11	1. The players must not have to wait long for their turn	Chidren analysis
12	The game must measure the social/ emotional development as much as possible.	Development domain
13	The game must measure the social development to the fullest extent.	Development domain
14	The game must meaure the moral development, emotion regulation and ego development as much as possible.	Development domain

G. Morphological chart

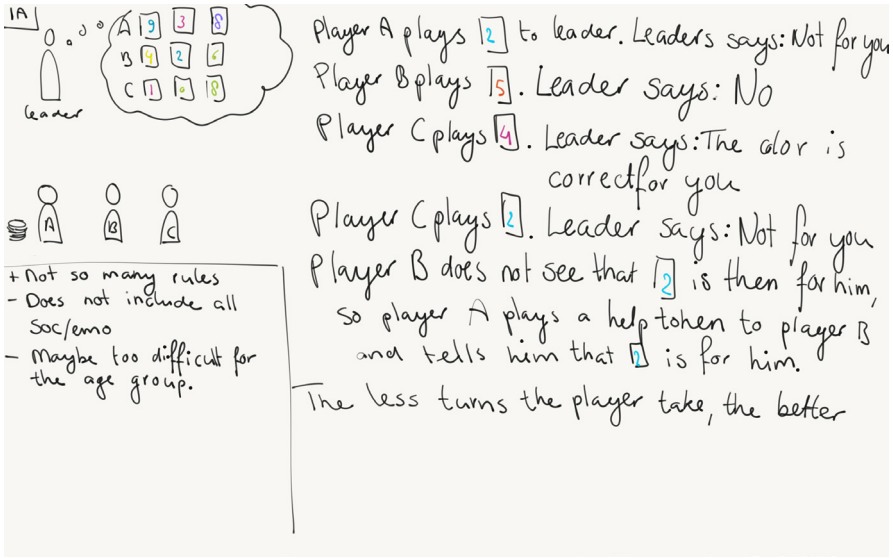
	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19
Game type	Role playing	Puzzles	Physical game	Board games	Card games	Paper-based games	Dice games												
Goal	Get rid of cards	Collect cards	Collect tokens	Collect points	Survive	Arrive at end position	Create combinations	Guess clue	Defeat enemies	Solve puzzle	Complete assignment	Remove other players from game							
Players	All vs game	All vs 1	Teams	Everyone separate															
Actions	Draw card	Draw	Note	Balance	Discard	Hide/find	Roll dice	Move token	Move (player)	Play card	Guess	Build	Count	Bluff	Discuss	Ask/answer	Act	Puzzle/think	Explain
End of game	Assignment achieved	Collected everything	Tokens/cards collected	Points achieved	Out of assignments	Out of time	Get rid of everything	Last man standing											
Measuring	Question list afterwards	1 player keeps track during	Game measures automatically																
Independence	Without initiative nothing happens	Problem solving																	
Self confidence	Level chosing	Success of actions based on qualities	Asking for help																
Interaction with others	Contacting other players	Sharing experiences	Be similar to others																
Dealing with authority	Having respect for authority																		
Interest in others	Asking for opinion of others	Asking how someone is doing in the game																	
Taking others into account	Involving players in activities	Helping others	Choosing difficulty based on skills																
Dealing with conflicts	Explaining your actions	Making up with people	Making consessions																
Keeping things with yourself	Keeping a secret	Keeping your emotion for yourself																	
Right and wrong from your own point of view	Recognizing unfair treatment	Treating someone unfair and apologizing																	
Right and wrong for others	Recognizing unfair treatment	Standing up for someone else	Understanding why someone did something wrong																
Abiding rules	Following the rules																		

H. Ideas

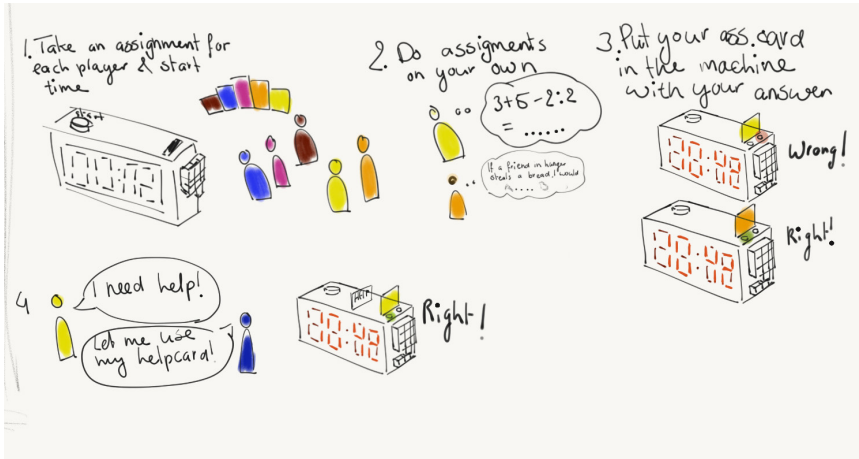
H.I Idea 1

Game type	Puzzle
Goal	Guess your code
Players	All against one
Actions	Play/draw cards, ask questions
End of game	Time is up

Explanation
One player comes up with codes that the other players must guess. These players then each play cards to get feedback from the 'one player' about if that card is part of the code or not. This feedback can also be about other players' code. Therefore, by working together, the players can guess their code.
Not so many rules
No opportunity to implement all soc/emo without making it very complicated
Maybe too difficult for age group



Idea 1b
Explanation
From the box, a set of assignment cards are taken. Each assignment is a different type of assignment (by color). Each child gets one assignment, if this is fulfilled, the assignment is placed in 'the machine' and the answer is given through buttons. If the answer is correct, the green light lights up, if it is incorrect, the red light lights up. If the red light is lit up, the player can ask for help from other players. To do this, they place their help card in the machine so it knows that help was given. The game ends (and the machine stops timing) when all assignments are fulfilled.
Different kind of assignment possible
Way of measuring incorporated in the game



H.II Idea 2.

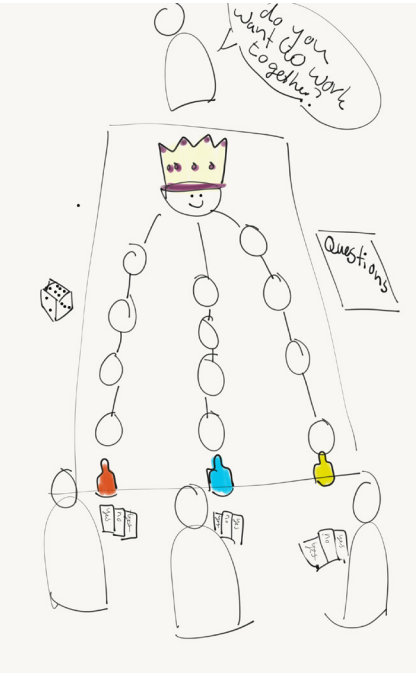
Game type	Board game
Goal	Reach the end of the board
Players	Everyone separate, option for teamplay
Actions	Play cards, answer questions, roll dice
End of game	Player has reached the end

Explanation

One player is the king (or queen) and the other players are the knights. The goal of the knights is to take over the throne of the kind, the goal of the king is to stop the knights from doing this.

Each round, the knight whose turn it is answers a question from the king. If the answer is correct, the knight takes a step forward, if the answer is wrong, the knight takes a step backward. After this, each knight rolls a die, the knight who rolls the highest number can now ask a question to the king or to another knight. In both cases, if the answer is correct, the knight who asked takes a step backwards. If the answer is incorrect, the knight who asked takes a step forward.

Knights can also form alliances for a round, but the knight need to be careful, since a fake alliance can also be formed.

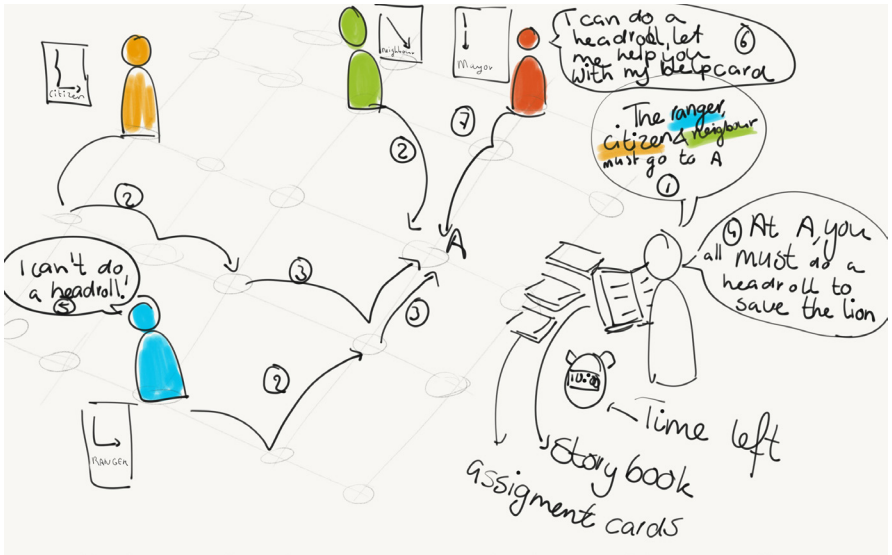


H.III Idea 3.

Game type	Active/roleplaying game
Goal	Fulfill the assignment
Players	All against the game
Actions	Move (player)
End of game	Time is up

Explanation

Each child gets/creates a character, based on their own preferences. This character defines what a child can and can not do. The children then spread out over a set up field and the pedagogical employee tells the chosen story from the storybook. In the story, the characters follow a story in which they have to do assignments, which the children have to do. Each assignment has a location on the playing field and characters required. After getting to the location as soon as possible in the way that the characters can move, the assignment has to be executed. If the children succeed, they get a point (like a saved animal) and the story continues. They can also ask for help from other players. If they don't succeed, the story also continues, but it does influence the story. If the story is ended and the complete assignment (like save 10 animals) is succeeded within the set time, the children win.



H.IV Idea 4.

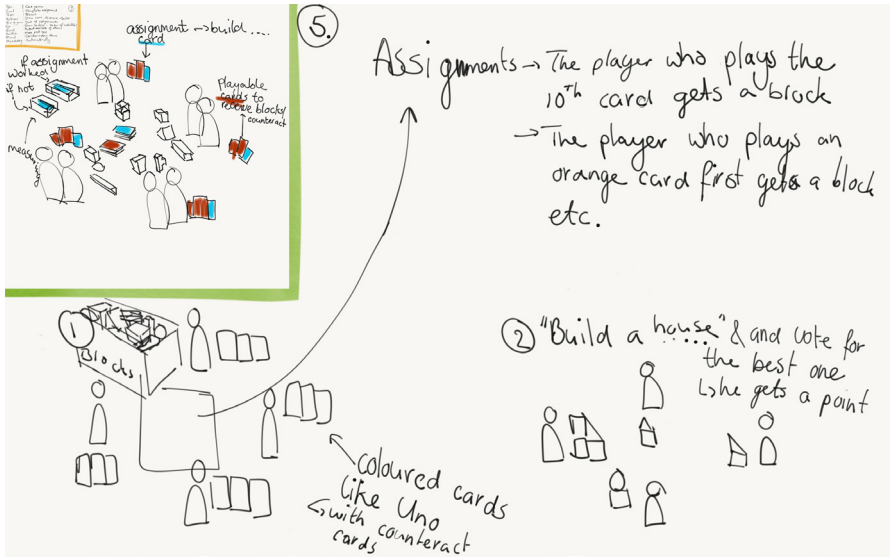
Game type	Roleplaying game
Goal	Fulfill the assignment
Players	All against the game
Actions	Play cards, puzzle
End of game	Time is up

Explanation
One player is the guide, the other players have a character that decides what they characteristics are. The guide tells the story and leads the players through it, in which they have to make decisions and fulfill assignments through puzzles. Each time a choice is made, or a puzzle is solved, the card of that decision/puzzle is placed in the 'succeed' tray, the other cards are placed in the 'failed/not used' tray, in this way, the decisions and progress of the players can be tracked.

H.V Idea 5.

Game type	Card game
Goal	Collect points
Players	Everyone separate
Actions	Play cards, building, voting
End of game	Points achieved

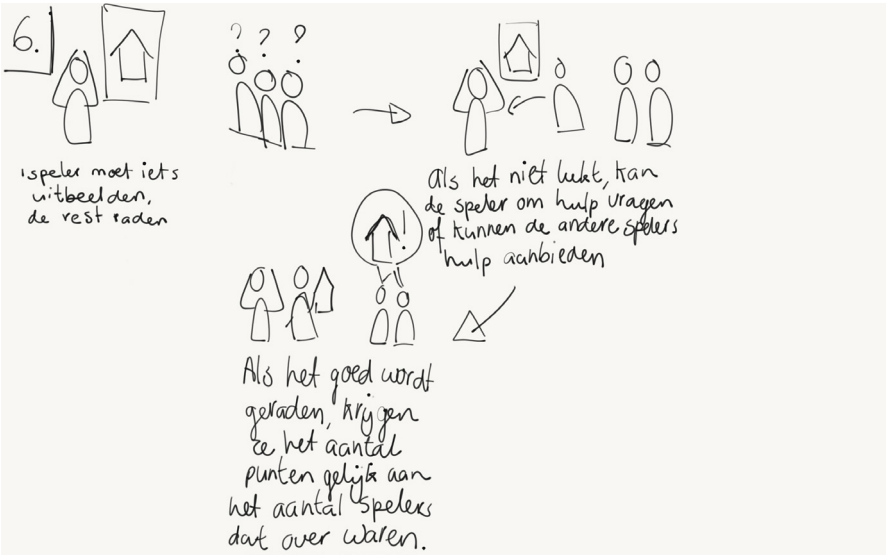
Explanation
Every player gets three cards. These cards are coloured cards with numbers or actions. An assignment card is taken from the pile and read out loud. The assignment is a specific action which the players must try to do, because when they do this, they get a cube. In order to fulfill the action, the players must play their cards whenever they like, but one at a time.
After one player has fulfilled the assignment, a building assignment is taken from the pile. In this assignment, the players have to build with the cubes that they have won by playing the cards. After building, the players vote for the best built, this player then gets a point. If a player reaches 10 points, he wins the game.



H.VI Idea 6.

Game type	Active game
Goal	Win points
Players	All vs game or teams
Actions	Act, guess
End of game	Time is up

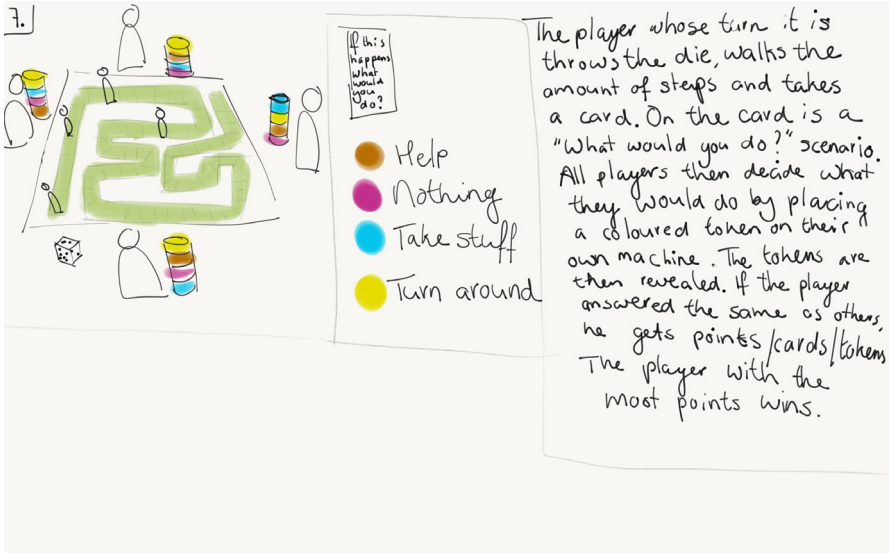
Explanation
This game is played in teams or with the whole group as one team. One player takes a card, on this card it says what he/she needs to act out. He/she then starts doing this and the other players can guess. If the players do not get it, they can come and help the player, or the player can ask for help. Then, they have to act it out together, this happens until there are no players left or the word is guessed. The team then receives the amount of points equal to the amount of players that were left guessing.



H.VII Idea 7.

Game type	Board game
Goal	Collect cards
Players	Everyone separate
Actions	Decide, move character
End of game	Player reaches the end

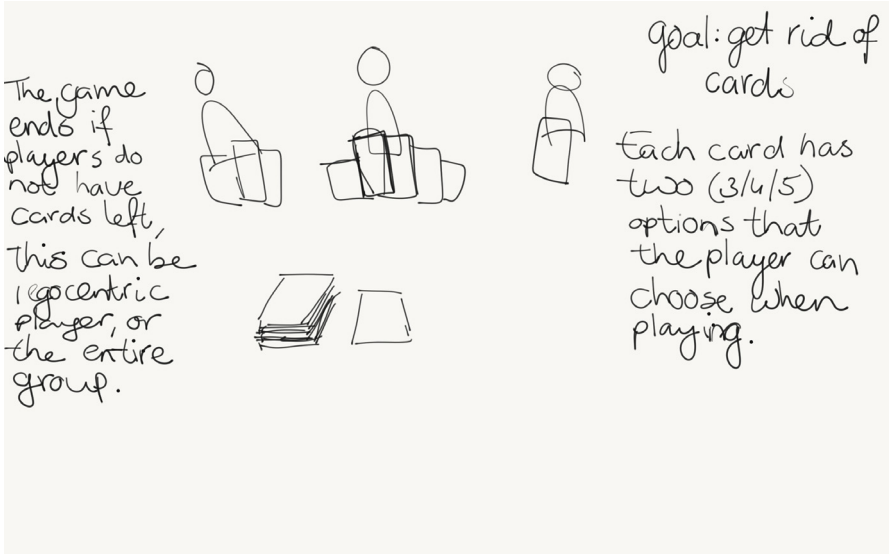
Explanation
The players take turn clockwise. When its his turn, the player gets a card. The card has a 'What would you do?' scenario. Each player then decides what he would do out of certain options. The choices are then revealed. If the playing player has the same answer as other players, he can move his character on the board.



H.VIII Idea 8.

Game type	Card game
Goal	Get rid of all cards
Players	Separately or together
Actions	Play cards, interact with others
End of game	No cards in the hands

Explanation
All players receive x amount of cards in the beginning, of which they need to get rid off. They can try to do this on their own, but also help others to achieve the goal together. The players do not know from eachother how many cards they have, so they do not know how far other players are.
All cards have different actions on there, by playing a card, the player decides which action he chooses, most of the time one action is helpful for him, the other is helpful for the group.



I. Full test results of the ideation games

Idea 1.

Played by 3 participants
Although the game in itself worked, it was way too simple and short to actually be a game. The participants however did like that they had individual tasks which they could do simultaneously and they did check in with each other to see what the other player had to do, but no help was given because it was not needed. The assignments could have been more difficult. Although it was expected that the social/emotional domains could be incorporated easily, this resulted to be more difficult. An improvement would be to make the players pick their assignment category to add the confidence/self knowledge factor.

+ Individual tasks (which stimulated checking in with each other)
+ Working simultaneously

- Incorporating social/emotional elements in one person assignments is difficult

Idea 2.

Played by 3 participants
On paper, this game seemed relatively simple. However quite some changes have been made during the test to make it easier/more playable/more exciting:

During explanation it became clear that it has to many elements to understand all at once, which would even be more difficult for small children. During testing it was decided to skip the throwing the dice and asking a question back. The guessing of the king/queen about the alliance was also canceled, however, as I played the queen myself, I noticed that I did start guessing what the participants would do.
In order for the participants to make a better judgement about whether they wanted an (fake)alliance, announcing the category of the question was added.
To keep it more exciting, it was concluded that it would not be told who voted what when no alliance was formed.

An unexpected scenario that happened was that one player who had to answer the question voted for a fake alliance himself, with the thought that if he answered the question wrong, he would win a place. Since this would not be fair, the rule that this player can not vote for a fake alliance thus must be added.

Another thing that should be taken into account that taking a step back for a wrong answer is quite a big punishment. Therefore, this 'punishment' should be lighter, or the win for a good answer should be bigger.

Since the king/queen now did not have a role other than asking the questions, this became a bit boring fast. Therefore, the king/queen should have an extra role.

Overall, and with the changes, the participants were positive over the game, but did show some concerns for the difficulty with children.

+ It is fun to work with alliances
+ It is fun to have the option to have a fake alliance
+ Everyone is active in everyones turn

- Since only knowledge questions were asked, there were not a lot of social/emotional elements.

Idea 3.

Played by 3 participants
In order to make this game playable in a small space, it was decided to play the game on a board and with pawns.

In the game, the story was that the players had to work together to save animals from the jungle. Each participant could choose a character from the three created characters. These characters decided how the player could move over the board.

Initially, the goal for the players was to fulfill the assignments in 'as less turns as possible', however, this showed to be not enough motivation for some

players since there was no consequence. Therefore, a maximum amount of turns for the entire game was created.

Overall, the participants were very excited about the game (theme, assignments, own character, working together, active game) and together came up with some additions:
Add obstacles such as walls or water, over which certain characters can, and certain cannot travel
Change the field / starting position every time it is played
Players can receive a 'helpcard' after they helped someone successfully, instead of handing in one
Option to play on a board, as well as in a space

However, some things to note is that it should be possible for all players to reach all locations on the playing board (because of diagonals).

+ Fun to play
+ The game is different than other games
+ Although this theme (jungle) was a success, other themes can easily be included
+ Every game can be different because of different assignments/ different characters etc.
+ Because of the working together, the needing each other and the assignments, there are a lot of opportunities to incorporate the social/ emotional

- Being the guide should be possible for a child to do, or no guide should be necessary

Idea 4 / NTY,E!.

Played by 4 participants
Because idea 4 was very close to the existing game No Thank You, Evil!, it was decided that playing this game would create the same/even more insights about the idea.

The opinion about this game was very much divided. The thing that makes roleplaying games fun, is that players are really engaged in the story and truly believe that, at that point, they are living the story and they are their own made character. However, in this test, this was not the case. This could be the case because of the personalities of the participants (not being a child). Two of the four participants did truly try to be engaged in the story, but it did not work because of the two other participants.

Another factor in the engagement of the players is the preparation of the guide. If the guide truly believes the story and is convincing, this will make it a lot easier for the players. This however lacked in this test and should therefore be improved. However, it can not be expected from the pedagogical employees or from the children to be able to do this, therefore, another option for this has to be created in order for it to possibly work in the context.

Although the doubtful reactions of the participants, they were able to discuss the positive and negative points about the game.

+ Having a big influence on the game makes it fun for the players
+ Being able to make choices for the game and for yourself is fun
+ Although the game turned out to be different than expected, there is still quite a lot of potential for the social/emotional domain in this type of game
+ A fun thing would be for characters to not have spending points to make throwing the dice easier, but to have a base level because they are good at something, this would engage the players more.

- A game should not require the players/one player to prepare fully for a game, the game should be playable at any moment
- Players must be engaged to have fun

Idea 5.

Played with 3 participants

Beforehand, it was expected that the playing cards on own initiative would not work because players would simply not play cards, however, this showed to be no problem at all. The rules were very easy for the players and they could start playing very fast.

Because of lack of actual building blocks, random materials were taken from around the house, like a bottle cap, a battery and a small box. The participants had fun building things.

Overall, the reactions to this game were quite positive, but not crazy positive. They did mention that it felt more like two games instead of one. Also, some concerns were shared about the voting since children might vote for their friend instead of for the best building.

+ Own initiative worked very well
+ Fun to build

- The two parts of the game were not intertwined so it felt like two separate games
- Possibly not suitable for children because of voting, although this does add a social/emotional part

Idea 6.

Played by 4 participants

The players all worked together in this test. Each player had 30 seconds to act out the card, then another player jumped in to help. The players had a lot of fun figuring out how to act out the words together. However, because there was no choice in whether you wanted help, it was less fun.

+ Fun to act
+ Figuring out how to work together was fun

Idea 7.

Played by 4 participants

During the explanation of this game, it was made clear that it was expected from the players to truly vote what they think they would do, since voting for something else can counteract other players. It is expected that asking this from adults is easier than from children, they might show socially desired behaviour to do better in the game or to present themself better to other players.

Answering the questions did bring up some interesting discussions between the players. However, one of the participants (who has experience with children in the target group) mentioned that children have a lot of trouble expressing their opinion, so this could come in the way of this game. Furthermore, discussing these opinions felt more like icebreakers for a conversation than of a fun game.

+ Interesting to discuss opinions
+ A lot of social/emotional elements are incorporated in the game

- Not much of a game
- Can be difficult for children to express their opinions

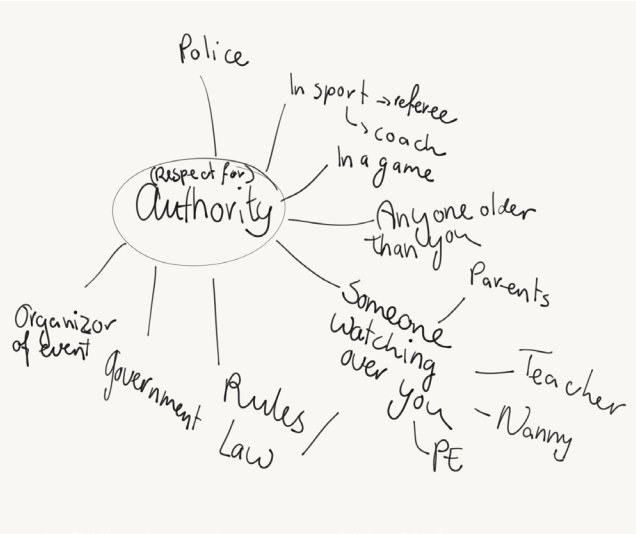
Idea 8.

Played by 4 participants.

During the first round of the game, it became clear that there is no motivation in this game to do something positive for the group. Therefore the change was made to play in teams, where if one player of a team wins, the whole team wins. This did change the way the players played and made their reactions a lot more positive.

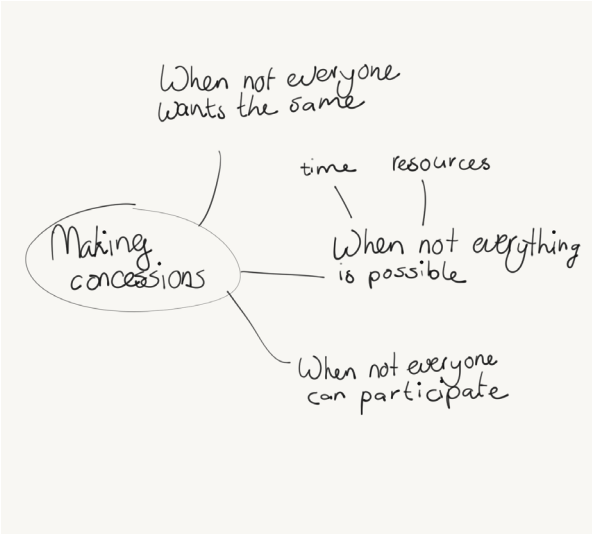
+ It is nice if your decisions can influence everyone
+ There is quite some tactic required in this game

J. Social/emotional enhancement brainstorm

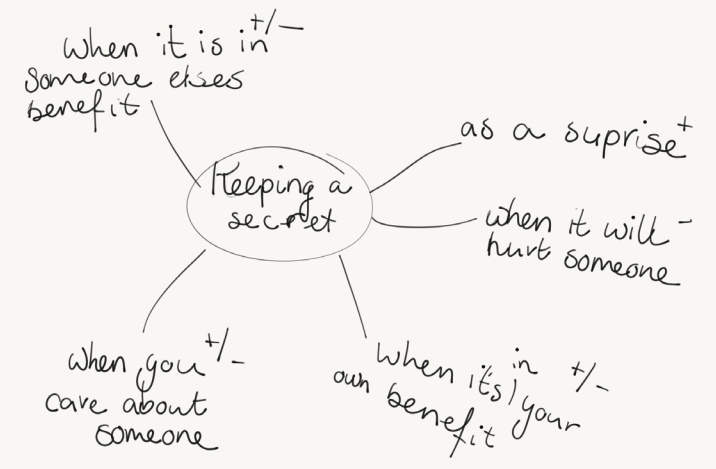


Dealing with authority

Standing up for someone

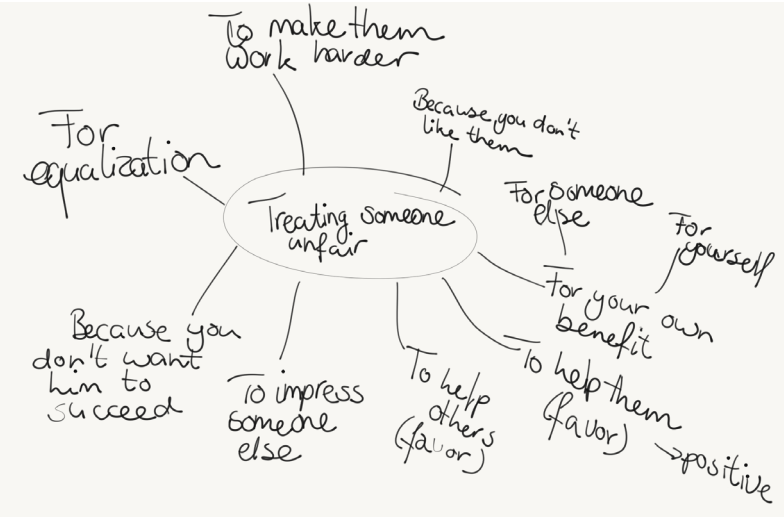


Making concessions

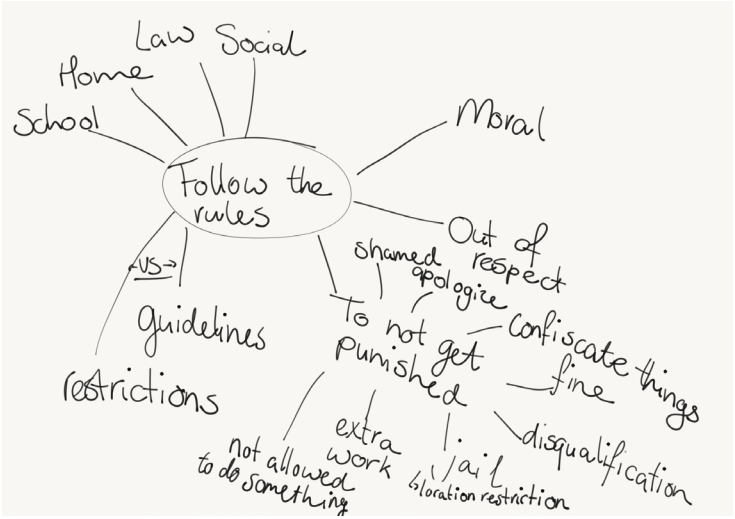


Keeping a secret

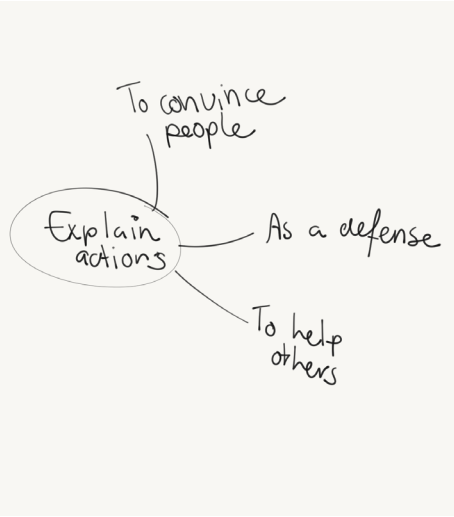
Involving people in things



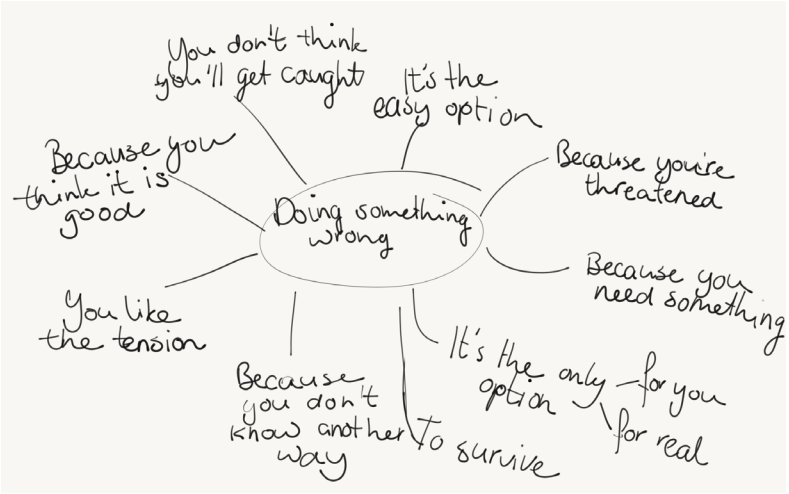
Treating someone unfair



Following the rules

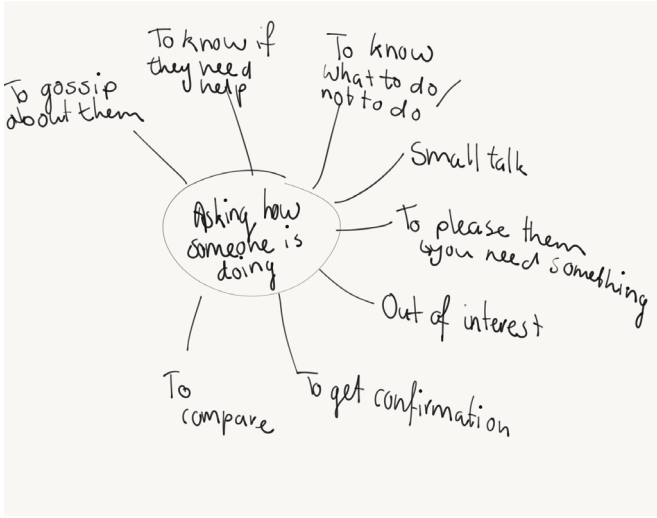


Explaning your actions

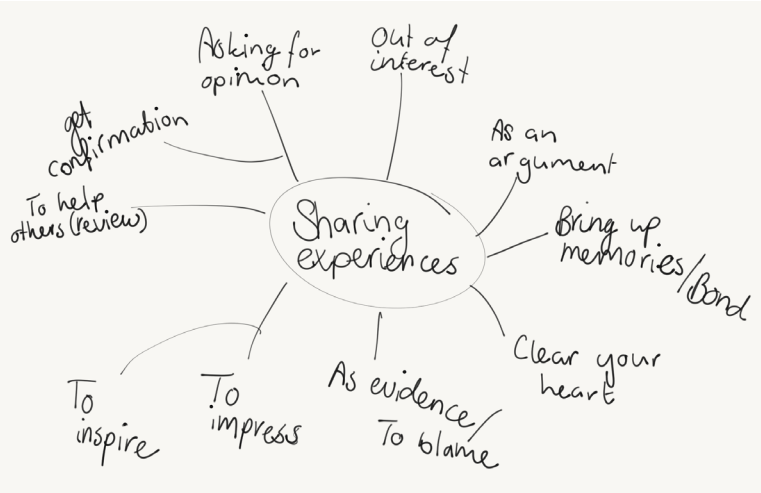


Doing something wrong

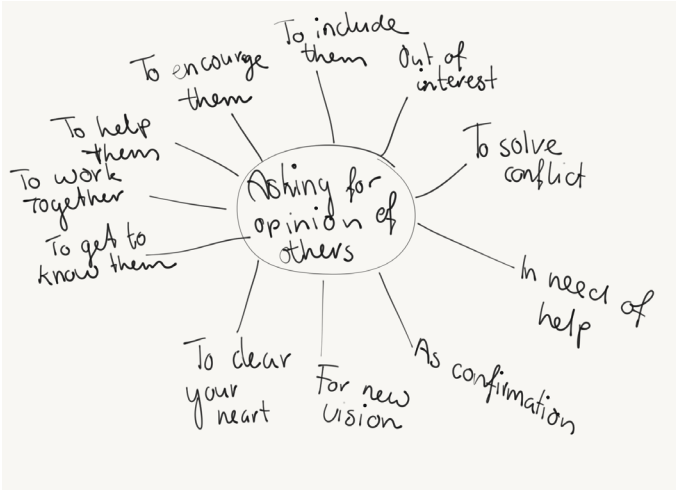
Recognizing unfair treatment



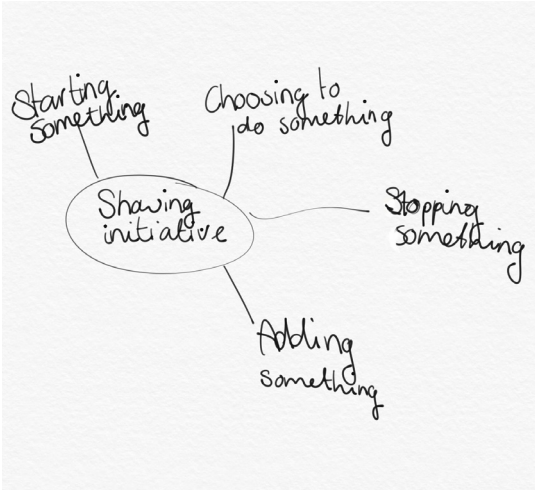
Asking how someone is doing



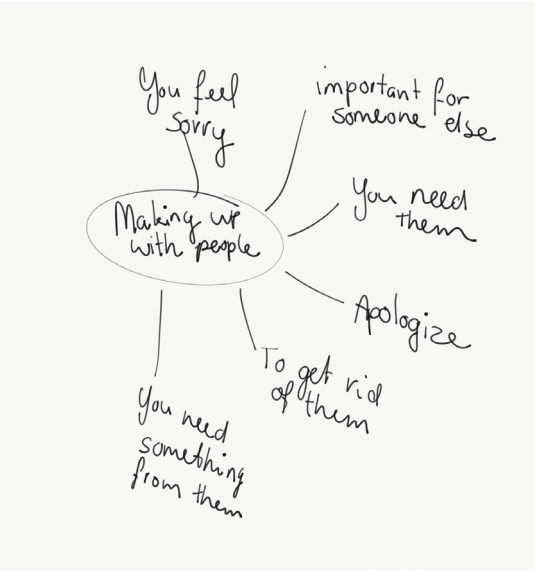
Sharing experiences



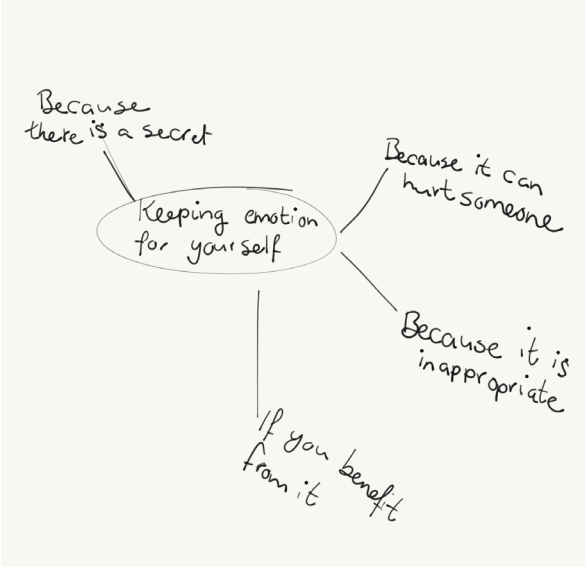
Asking for someone elses opinion



Showing initiative



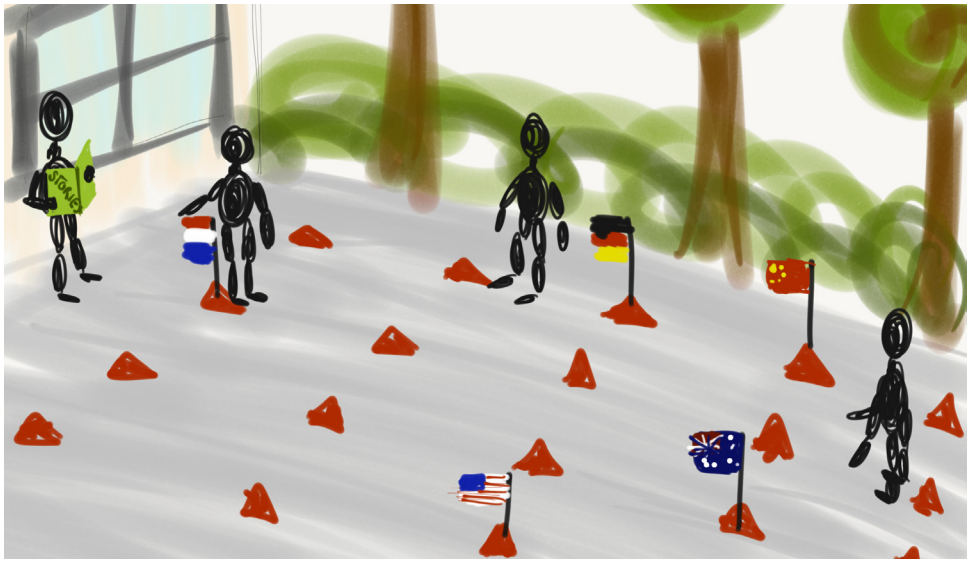
Making up with people



Keeping your emotion to yourself

K. Full concept explanations

J.I teQ's adventure



Game explanation

Game elements

Game type	Active/board game
Goal	Fulfil assignments
Players	3-6, all against the game
Actions	Move (player) or move (pawn), ask/answer, puzzle/think
End of game	Assignments fulfilled or out of moves

Game play

In teQ's adventure play all players together to fulfil teQ's adventure. Every game has its own adventure with assignments. The game can either be played in a large room where the players move around the grid of pawns, or can be played on a board at a table where the players move around as pawns on the board.

Every player has its own (created) character, with his own specifications about characteristics and ability to move around the grid. During the game, the players have to fulfil assignments in order to complete the adventure. But the players need to be careful! Every adventure had a difficulty level in the shape of amount of moves the players can make, otherwise they will lose the game together.

Every assignment has its own location on the grid and required characteristics. After the right characters have moved to the location, the assignment has to be fulfilled. The assignments can be a knowledge question, ethical question, physical assignment, creative assignment, and more.

Year theme

The year theme can be implemented in the adventure. A 'Wonderful world' adventure can revolve around different countries, cities, cultures. A 'Future' adventure can be about travelling through time and space.

Based on

teQ's adventure is created by combining Idea 1 (fulfilling individual assignments), Idea 3 (active game around a story) and Idea 4/No Thank You, Evil! (roleplaying game).

The biggest problems of these ideas were;
Idea 1. Incorporating social/emotional elements in only individual assignments can be difficult. teQ's adventure therefore contains both individual as team assignments. The different type of assignments also create more opportunities for social/emotional elements.

Idea 3. In this idea, there was one guide who had to tell the entire story. Because this could be difficult for children, in teQ's adventure, the players are together the guide and the story part is toned down a bit. This decreases the amount of reading players have to do and includes everyone in the game.

Idea 4./No Thank You, Evil! Following the issue of Idea 3, this game required a guide, who also had to do a lot of preparation. As explained above, this problem is solved. This however does also mean that there are less options for creativity and influence from the players during the game. However, since this was experienced as quite difficult in the test, it is not a problem that this is decreased.

Social/emotional elements

Independence	Without initiative nothing happens	Players must decide who is going to move and fulfill the assignment. So in order to play along, players must show initiative, otherwise they will stay on their spot.
	Problem solving	In order to reach a location, players must search the fastest way to get there. For some assignments, problems also have to be solved.
Self confidence	Level choosing	Players have the option of doing something more difficult to win more points, or something easier for less points.
	Success of actions based on qualities	Whether an assignment is fulfilled, is based on the qualities of the player.
	Asking for help	If a player thinks he can not succeed an assignment, he can ask for help from his fellow players.
Interaction with others	Contacting other players	The players have to work together, and communicate in order to succeed in the game.
	Sharing experiences	Some locations on the grid are 'secret locations'. The first player who arrives here must decide whether to share this location and its possible resources/traps with the other players, or to keep it for himself. [2]
Dealing with authority	Having respect for authority	When the game is played with a game leader, this player is the authority and his decisions must be respected. In case the game is played without a game leader, the game is the authority. During the game, situation cards can be present that changes rules or decides something for someone. Whether the player will follow this change/rule/authority decision will determine his relation with authority and respect to rules. [3]

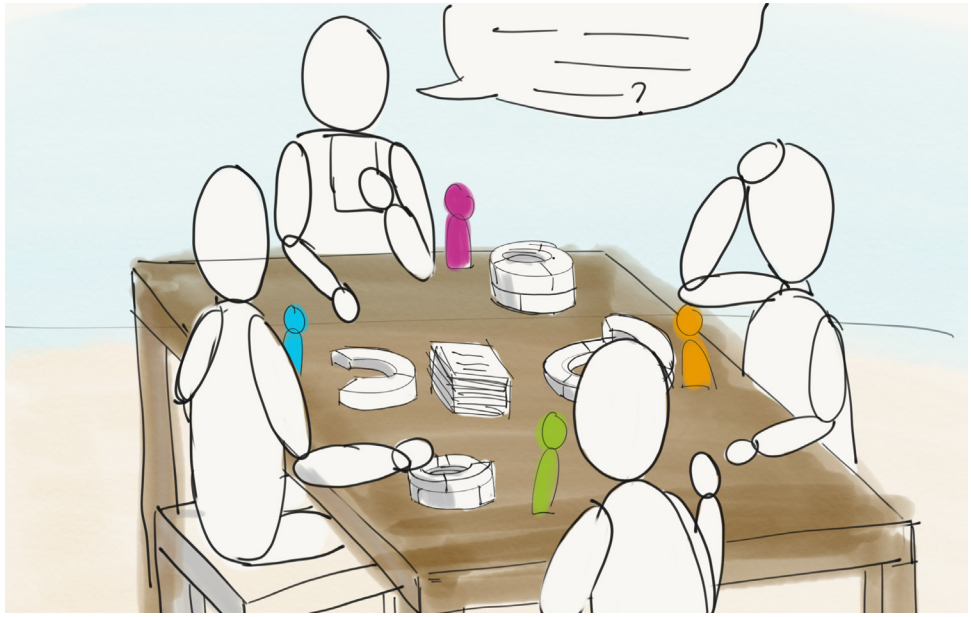
Interest in others	Asking for opinion of others	When working together, players must ask for each others opinion to gain the most from their teamwork. In order to measure it, it can be part of assignments where it is tested if they did this.
	Asking how someone is doing in the game	Although it is not required in the game, it is likely that the players will ask about assignments that they did not have to do. In addition can it be present in assignments.
Taking others into account	Involving players in activities	Players need to involve other players because of their strengths (characteristics) to fulfill assignments
	Helping others	Players can choose to help someone.
	Choosing difficulty based on skills	The stories in the storybook will have different difficulty levels (in amount of assignments & amount of turns).
Dealing with conflicts	Explaining your actions	When individual assignments are executed, players might have to explain why they did it in a certain way.
	Making up with people	This is not incorporated (yet) in the game
	Making concessions	All players can not fulfill all assignments, so concessions have to be made about who does what.
Keeping things with yourself	Keeping a secret	"Answers to questions must be kept a secret till the answer is given. Some locations on the grid are 'secret locations'. The first player who arrives here must decide whether to share this location and its possible resources/traps with the other players, or to keep it for himself. [2]"
	Keeping your emotion for yourself	Some locations on the grid are 'secret locations'. The first player who arrives here must decide whether to share this location and its possible resources/traps with the other players, or to keep it for himself. [2]
Right and wrong from your own point of view	Recognizing unfair treatment	The situation cards can also be used to see if players will treat someone else unfair if it is in their own benefit. [3]
	Treating someone unfair and apologizing	The situation cards can also be used to see if players will treat someone else unfair if it is in their own benefit. [3]
Right and wrong for others	Recognizing unfair treatment	The situation cards can also be used to see if players will treat someone else unfair if it is in their own benefit. [3]
	Standing up for someone else	Part of the assignments.
	Understanding why someone did something wrong	This is not incorporated in the game
Abiding rules	Following the rules	In case the game is played without a game leader, the game is the authority. During the game, situation cards can be present that changes rules or decides something for someone. Whether the player will follow this change/rule/authority decision will determine his relation with authority and respect to rules. [3]

Measuring social/emotional

Each assignment addresses a different social/emotional domain. By measuring which assignments are successfully completed and which are not, it can be measured what the social/emotional development level of the players is. This however does mean that the level is measured for the entire group, and not for children separately.

This however can be done for certain assignments or for the possibility to help each other with assignments.

K.I Tower defense



Game explanation

Game elements

Game type	Board game/table top game
Goal	Build your tower
Players	2-4, all separate
Actions	Ask/answer, build
End of game	When 1 player has completed his tower

Game play

In Tower defense, each player tries to build his tower to defend his land by estimating the actions of the other players. In order to counteract other players, they can also attack another player's tower by asking him knowledge questions. However, by forming alliances, players can work together in defending their tower. But they have to be careful, because before you know it, you are in a fake alliance and are attacked by your own friends.

Year theme

The year theme can be implemented by what the players need to build; Instead of a tower, another type of building structure can be build, or items from a thing can be collected.

Based on

Tower defense is created by combining Idea 2 (Knowledge questions and (fake)alliances) and Idea 7 (estimating others' behaviour).

The biggest problem of these ideas where:
Idea 2. There was no clear role for the king/queen, therefore, all players now have to defend and attack.

Idea 7. Although the estimating others' behaviour worked well, it was not much of a game. Therefore it is now incorporated in this game.

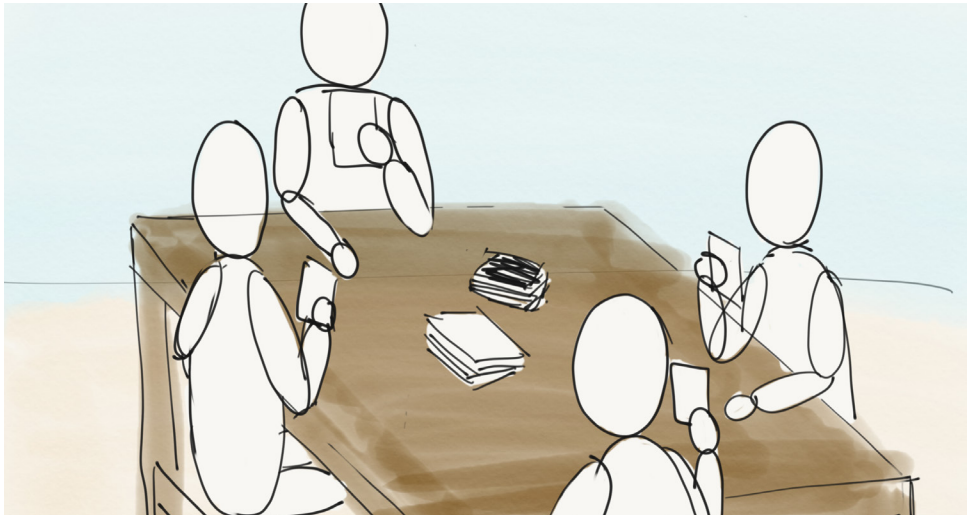
Social/emotional elements

Independence	Without initiative nothing happens	Players must decide for themselves if they want to attack or defend.
	Problem solving	If players see that their wall is getting low, the player must solve the problem by choosing to defend. Or if they see that another player is close to winning, they have to solve this problem by attacking him.
Self confidence	Level choosing	Players can choose the difficulty of the question with which they are attacked
	Success of actions based on qualities	If players have a great knowledge and/or great empathy, they will do better in the game
	Asking for help	Players must decide if they need help defending their tower when answering the question.

Interaction with others	Contacting other players	If an alliance is formed, players must contact others in order to come up with the answer together.
	Sharing experiences	This is not incorporated in the game
Dealing with authority	Having respect for authority	The player who is attacked much respect the authority of the person who is asking the question.
Interest in others	Asking for opinion of others	If an alliance was formed, players must ask for each others opinion in order to come up with the answer.
	Asking how someone is doing in the game	In order to decide who to attack, players must ask others how they are doing.
Taking others into account	Involving players in activities	Players can form an alliance to involve other players.
	Helping others	Players can decide to help another player to help them in the game
	Choosing difficulty based on skills	If an alliance was formed with someone who knows a lot about a certain topic, they can choose to pick a higher difficulty for the question.
Dealing with conflicts	Explaining your actions	If a player is in an alliance, but doesn't trust his 'allies' he can decide to answer differently then his allies recommend. This will require some explanation.
	Making up with people	A conflict can form when fake alliances are formed, or when wrong answers were given. This will require making up with them.
	Making concessions	There is an option to create a deal with players about the alliances that they will form.
Keeping things with yourself	Keeping a secret	If a player has decided to form a fake alliance, he must keep this a secret in order to win something from it.
	Keeping your emotion for yourself	If a player has decided to form a fake alliance, he must keep this a secret in order to win something from it.
Right and wrong from your own point of view	Recognizing unfair treatment	If a player is almost finished with the building of his wall, the players can choose to make it more difficult for him with the extra option, this however is a choice that has to be made for every player separately.
	Treating someone unfair and apologizing	The What whould you do? cards also contain situations where this is tested
Right and wrong for others	Recognizing unfair treatment	If a player is almost finished with the building of his wall, the players can choose to make it more difficult for him with the extra option, this however is a choice that has to be made for every player separately.
	Standing up for someone else	If one player is attacked over and over again, other players can stand up for this player. In an alliance, players can also stand up for someone's opinion.
	Understanding why someone did something wrong	If a player is almost finished with the building of his wall, the players can choose to make it more difficult for him with the extra option, this however is a choice that has to be made for every player separately.
Abiding rules	Following the rules	Players must follow the rules, if players notice that someone is cheating, they can decide to let him hand in a building block.

Measuring social/emotional
The 'what would you do' situations are social/emotional testing questions. By knowing what the players answer, you can measure their social/emotional development level. In the same time, by measuring how much a person can correctly empathize with other players measures their empathy.
Simultaneously, by knowing if players form an (fake)alliance, and then by knowing if they answered the question correctly, also measures the social/emotional development level.

K.II Team Dilemma



Game explanation

Game elements

Game type	Card game/active game
Goal	Win points
Players	4+ (teams)
Actions	Play cards, draw cards, decide, act, guess
End of game	Points achieved

Game play
In Team Dilemma, players try to win points in teams. A team wins a point when a player successfully acts out a word and is thus guessed by his/her team. Teams get the opportunity to act out a word by trying to get rid of all their cards in the cardpart of the game. In the cardpart, players play cards on their own initiative and have to decide what happens when they play special cards, which can have influence on only himself, or on everyone.

Year theme
The year theme will be implemented by the words that the players have to act out. The aesthetics of the cards can also be part of the theme.

Based on

Team Dilemma is created by combining Idea 5 (own initiative card game), Idea 6 (acting out words with a team) and Idea 8 (card game with options for own benefit or group benefit).

The biggest problems of these ideas were:
Idea 5. The voting of the buildings is likely to become a matter of favoritism between friends. Therefore, this part is removed from the game. Another issue was that this idea were really two separate games. In Team Dilemma this feeling is decreased by working in teams.

Idea 6. The only issue was that there was no option to get help, you just got it if you did not succeed after 30 seconds. This option is therefore added in Team Dilemma.

Idea 8. In this idea, there was no reason for players to choose for the group benefit instead of for their own benefit. With the tests it was already concluded that working in teams would solve this problem, therefore, this was also incorporated here.

Social/emotional elements

Independence	Without initiative nothing happens	Players have to take the initiative to play cards, otherwise they will never lose their cards.
	Problem solving	Players have to individually decide what they choose as a special action, taking into account the cards of other players
Self confidence	Level choosing	Every act out card has different difficulty levels. Players can thus choose the difficulty of the word, also depending on the amount of points the team can win
	Success of actions based on qualities	The more successful players are in acting out words, the more points they gain, especially because they win less points when they take longer.
	Asking for help	When players know that they can not act their word out alone, they have to solve this by asking other people, otherwise they will not win points.
Interaction with others	Contacting other players	Players can interact during the card game and have to interact when acting out a word
	Sharing experiences	This is not incorporated in the game
Dealing with authority	Having respect for authority	This is not incorporated in the game
Interest in others	Asking for opinion of others	If a special card is played, players can discuss with their team members which options to choose
	Asking how someone is doing in the game	Players must know how their team members are doing (how many cards they have left) in order to decide which option they choose with the special card

Taking others into account	Involving players in activities	Players can decide who they want him to help with the acting out of the word.
	Helping others	After time has run out, players can decide to help each other with the acting of the word, but this would also help themselves since they are in the same team.
	Choosing difficulty based on skills	Since players can decide the difficulty of the word, they also have to take into account the skill of others since they have to guess.
Dealing with conflicts	Explaining your actions	After a player has decided for a certain actions with a special card, he might have to explain to his team members why he chose this option.
	Making up with people	This is not incorporated (yet) in the game
	Making concessions	When acting out a word and not succeeding in the first round, the players have the option to bring in a helper. However, it might happen that the team does not agree and have to make a concession about when to help.
Keeping things with yourself	Keeping a secret	If a team is acting out a word, the other team must not share their thought about what the person is trying to act out.
	Keeping your emotion for yourself	If a team is acting out a word, the other team must not share their thought about what the person is trying to act out
Right and wrong from your own point of view	Recognizing unfair treatment	If unfair treatment is caught, points will be taken from that team
	Treating someone unfair and apologizing	This is not incorporated in the game
Right and wrong for others	Recognizing unfair treatment	If unfair treatment is caught, points will be taken from that team
	Standing up for someone else	If the some teamplayers think that one player is not capable to acting out a word, another player can stand up for this player.
	Understanding why someone did something wrong	This is not incorporated in the game
Abiding rules	Following the rules	Players must follow the rules, if players notice that someone is cheating, they can decide to take away some of his points

Measuring social/emotional

By knowing what decisions players make (for themselves or for the team) and about the difficulty of the words and whether they need/want help, the social/emotional development can be measured.

L. Full test results of the concepts

Concept 1. teQ's adventure

Theme
The girl really liked the quest (collecting snacks) and the flags/countries on the board.

Characters
The characters were chosen based on the picture instead of the characteristics. Since picking the characteristics is part of the social/emotional measurement, this would have to be solved. A way to do this is to separate the picture from the characteristics. In this way, the characteristics would be chosen without other consequences.

Moving on the grid
The fact that every player had a different way of moving around the grid was too difficult. Using a die would probably solve this, however, then the 'luck factor comes in, something that might be experienced as less fun. Furthermore, figuring out which character can best do an assignment because of the maximum amount of turns is also part of the social/emotional measurement. Another possible solution is not giving directions but a x amount of steps a player can do. So, for example not 2 steps forward and 1 step aside, but simply 3 steps.

Required characteristics of assignments
Each character had the information of the movement and their characteristics. Because of the difficulty of the moving, the additional information about the characteristics was too much. It is predicted that because the characters were not chosen based on the characteristics, these were not taken into account.

Assignments
The assignment about the prisoner's dilemma was too difficult, assignments to act out words or standing on 1 leg were fun. However, one can not simply remove the more difficult assignments since they are part of the social/emotional measurement. Therefore, an easier way to involve this category in an assignment has to be found.

Concept 2. Tower defense

Theme
The girl really liked that she could physically build her own tower.

Attacking
When attacking another player, the question must be read out loud. However, the girl was not able to read that well yet, so this was too difficult for her. It must be taken into account that this girl is slightly younger than the target group, however, some children will be better at reading than other children.

Answering questions (when attacked)
The questions that had to be asked when being attacked were too difficult for the age of the girl. Easier questions have to be used.

Forming alliances
The concept of forming an alliance was clear for the girl. However, the fake alliance was not understood that well, both when to do it for herself as when the adults voted for a fake alliance; she then thought that there was no alliance. Since the (fake) alliances are part of the social/emotional measurement, it is likely that, in order to measure, the votes have to be recorded by a system. In this scenario, the players do not have to share the information about the alliance, the system will. This however still requires the players to understand what a fake alliances mean.

What would you do? questions (building)
The what would you do? questions were understood very well and were therefore used more than the attacking. This however is not a problem since the biggest social/emotional measurement part lies in these questions.

Concept 3. Team dilemma

Cardgame
At first, the adult played along with the girls. At this point, the cardgame was fully played. However, the girls did not like this very much so they did not want to play anymore. This however is an important part because of the social/emotional measurement. This part of the game therefore has to be made more fun or another way to measure these elements therefore has to be found.

Acting out words
The girls likes the acting out of the words very much. After the adult stopped playing, they continued with only this part. They did however not play in teams anymore, but just 1 girl acting out and the other ones guessing. The helping was also not used, which is a big part of the social/emotional measurement. It is not known if this was not done because it was not necessary or if they did not like this/did not know this was an option.

M. Test logs

M.I Test 1 - April 16

Testgroup: one 7 years old girl, two parents.

Most important insights

Theme

The girl really liked the quest (collecting snacks) and the flags/countries on the board.

Characters

The characters were chosen based on the picture instead of the characteristics.

Required characteristics of assignments

They did understand it, but there was too much information per character, so they did not use this.

Moving on the grid

Was too difficult

Assignments

Some were too difficult, others were fine and fun!

M.II Test 2a & 2b - May 11

Testgroup 1: 4 children, ages: 4x 7 years old

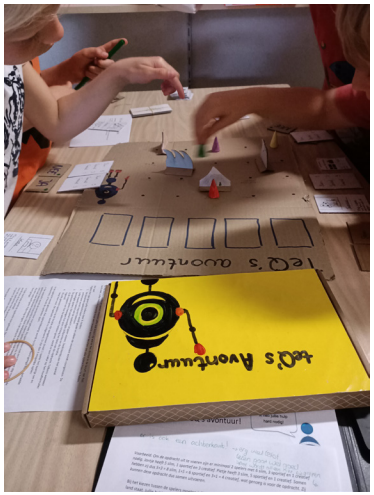
Testgroup 2: 5 children, ages: 1x 6, 4x 7 years old

Setup

- Played in a PA room with big pawn that created the grid (5x4).
- Game fully explained and guided by me, no self exploring.
- Assignment cards were given on the spot (to have influence on which assignments they did)
- Locations of countries were decided on the spot
- Amount of turns available was not shared or counted, to avoid an overload of information

Most important insights

- Children were very engaged with the characters that they had chosen
- They required some help with deciding what skill points they 'are', explained → do you like puzzles, playing outside or doing crafts?
- Children were very engaged in the countries and the snacks
- They had fun moving, but it was difficult to stay at one place
- Since there was no limited amount of moves, they did not focus on how much steps it would take.
- Deciding on who the assignments would do was difficult, they expected me to decide, they all just wanted to do it all. But with guidance, they could decide who were and were not suitable because of the skill points. Some children clearly had a better understanding of this than others.
- They required help sometimes, children really wanted to help, children were also able to say that they needed help



M.III Test 3a & 3b - 12 mei

Testgroup 1: 4 children, ages: 2x 7, 2x 8 years old
Testgroup 2: 4 children, ages: 1x 7, 3x 8 years old

Setup

- Played on the board at a table
- Game fully explained by me, less guidance during the game
- Assignment cards were given on the spot (to have influence on which assignments they did)
- Amount of steps was noted by me, not necessarily shared with the players

Most important insights

- Children were very engaged in helping teQ and searching for the countries
- Children took into account who already did a lot of assignments
- Although I did not share it actively, one kid noticed the amounts of turns they had left
- Children really looked at amount of players and required skill points for each assignments and could decide who needed to do the assignment

M.IV Test 4 - 26 mei

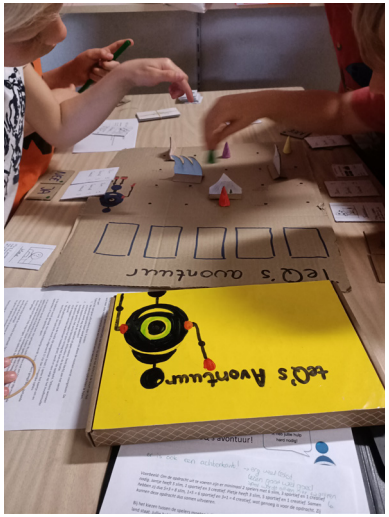
Testgroup: 4 children, ages: 1x 7, 3x 8 years old

Setup

- Played on the board at a table
- Game was given to the children and could explore themselves
- Game instructions were read by themselves
- Assignment cards were drawn from a stack (random order)
- Addition of blockages
- Amount of turns was noted by players themselves
- Heinz dilemma exercises with voting cards, given to me

Most important insights

- Reading of game instructions went well (child was a very good reader)
- Game instructions were way too long
- Game instructions were not understood → they did not know what to do when they could start → required a reminder during the game
- With the exception of one reminder, the amount of steps were noted each time very well
- Children wanted more blockages, because they were fun
- Characters were both chosen based on what characters it was and its characteristics
- Children took into account how many steps they could take, but did not take this into account when deciding who the assignment could do
- They did 6 assignments, so failed 1
- When one child did not understand something, the other child wanted to explain



M.V Test 5a & 5b - 23 juni

Testgroup 1: 4 children, ages: 1x 7, 3x 8 years old
Testgroup 2: 4 children, ages: 1x 7, 3x 8 years old

Setup

- Played on the board at a table
- Second time they played
- Game was given to the children and could explore themselves
- Game instructions were read by themselves
- Introduction of scanner
- Not keeping track of turns

Most important insights

- Since some things had changed since the children had played last time, they still had to read the instructions. Because they knew the basics of the game, they were not really motivated to read the instructions.
- They all wanted to scan and helped each other with it
- Colour codes on assignment cards were easily forgotten
- Confusion about mountains (if volcanoes are also mountains)
- The player who takes the card always executes the assignment
- Assignment cards are read out loud completely, even if they are not supposed to

M.VI Test 6a - 29 juni

Testgroup: 4 children, ages: 3x 7, 1x 9 years old

Setup

- Played on the board at a table
- All new time players
- Complete game was given for the players to explore
- Manual was read by themselves
- Keeping track of turns by me
- Answers of type 1 assignments were shown on the phone (scanner) and full sentences instead of yes/no

Most important insights

- Although they read very well, they were not able to translate the text to actions so extra explanation by me was necessary
- The children who did not read the manual, did also not pay attention to the reading out loud
- The placement off all elements was very difficult
- After this explanation, they were able to play the game independently
- One child was almost completely excluded from the assignments, until he said something about it, and then was included
- One child tried to cheat by moving across the board like he wasn't supposed to, but the other players saw and corrected him (multiple times)
- After they understood the game, they really liked it and had a lot of fun
- Assignments where they had to move/collect were really fun

M.VII Test 6b - 29 juni

Testgroup: 4 children, ages: 4x 7 years old

Setup

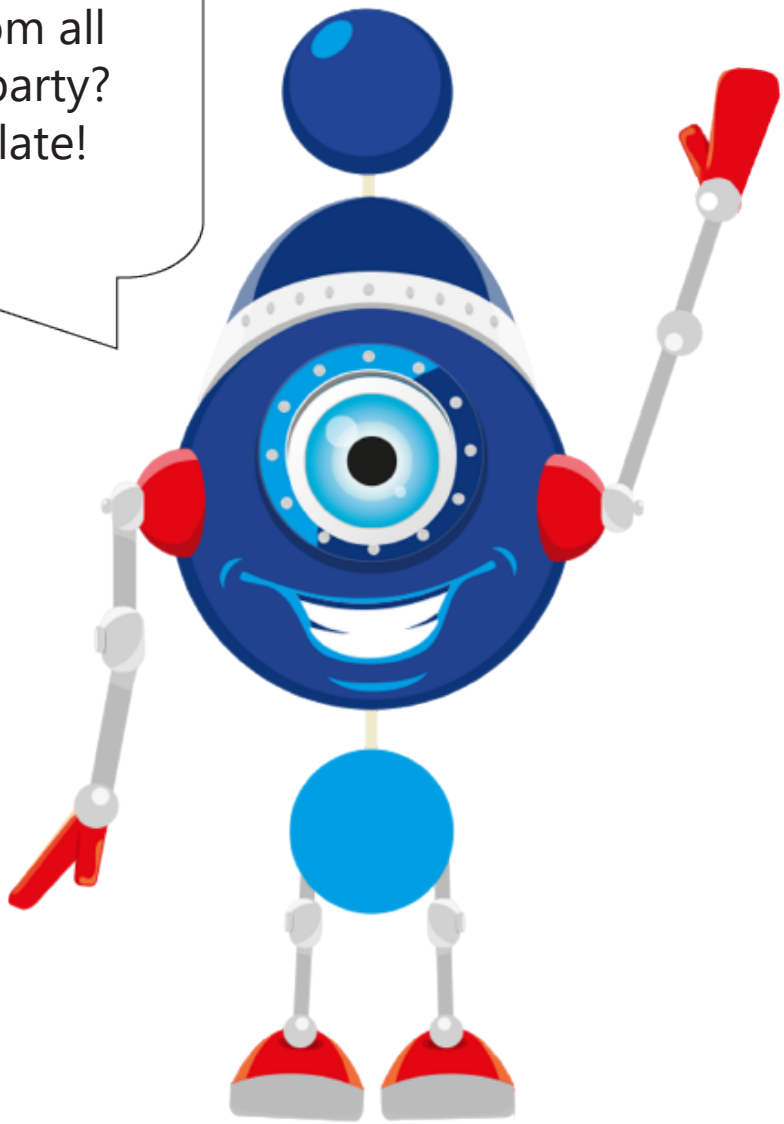
- Played on the board at a table
- All second time players
- Answers of type 1 assignments were shown on the phone (scanner) and full sentences instead of yes/no
- Game was stopped before the end because of time restriction

Most important insights

- Because they already knew the game, they did not feel like reading the manual, so I had to explain
- Transforming the amount of steps into the amount of turns was difficult at first, later they understood better
- Assignments where they had to move/collect were really fun

teQ's adventure

I need your help! Can you collect some snacks from all over the world for my party? Hurry, before it is too late!



1. Every player takes

1 pawn of choice

+

1 skill card that fits him best personally

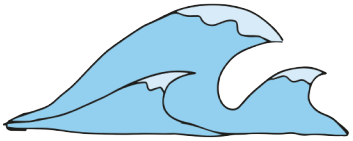
+

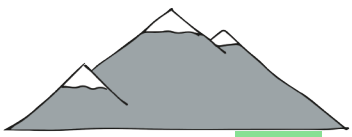
1 charactercard of choice

2. Place the board in the middle of the table, make sure that everyone can access the board easily.

3. Shuffle the cards and place them at the indicated place on the board

4. Take the top Placement card and place all rivers, mountains and pawns as indicated.

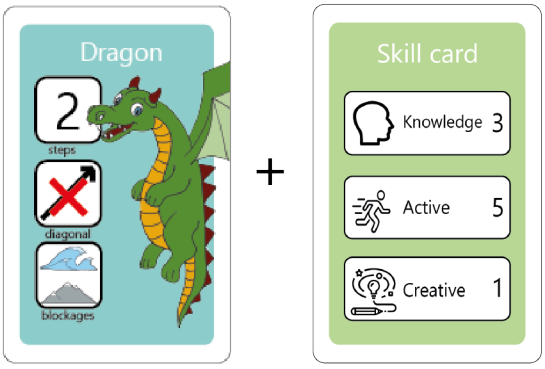




preparation

Turn the scanner on with the on switch on the back 5.

Each player logs in with his personal number, character card and skill card. 6.



character card skillcard

If all players are logged in, press 'Next', if more players have to log in, press 'Extra player'. 7.

With the group, pick a difficulty level and enter this in the app 8.

You are now ready to play! 9.

The app

During the game, you use the teQ'sadventure app on the tablet to scan the barcodes on all the cards, record the amount of steps your have taken, answer questions and enter if you have completed an assignment.

The character cards

There are 6 character cards of which you can choose from. Each character has an amount of steps he can take. Every time he has taken these steps, it counts as one turn. So if the dragon (2 steps) has to take 3 steps in order to move to a location, it counts as 2 turns. Some characters can also move diagonal or move across blockages.

The skill cards

Each player choses a skill card that fits him/her the best

Are you good at things that require a lot knowledge, like knowledge questions or puzzles? A skillcard with high points in knowledge fits you best!

Are you good at active things, like running, skipping or push ups? A skillcard with high points in active fits you best!

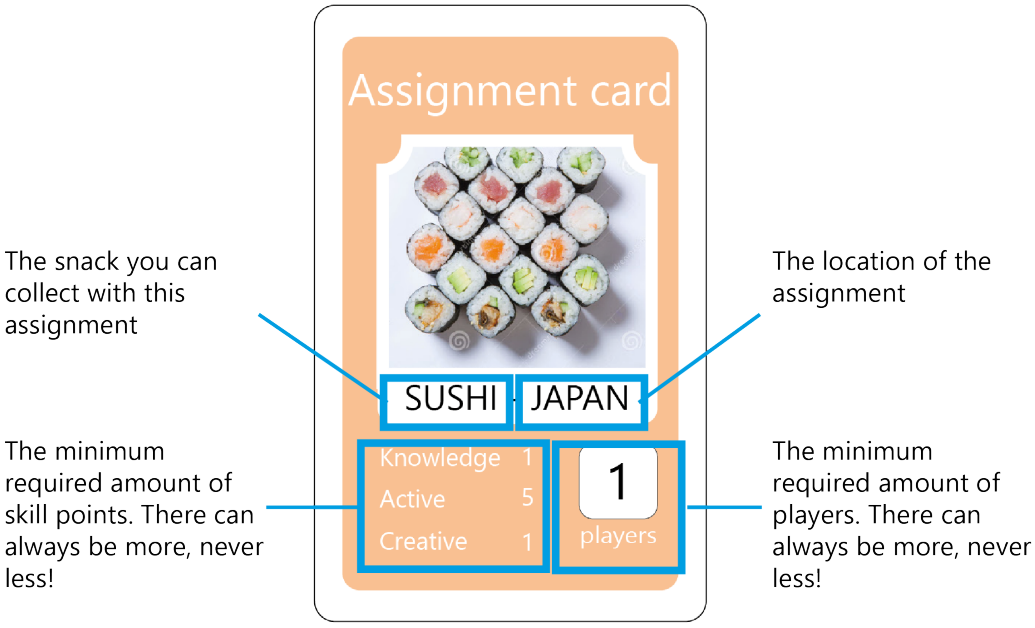
Are you good at creative things, like drawing, acting out and telling stories? A skillcard with high points in creative fits you best!

Skillcards decide who can execute certain assignments.

The goal

Your goal is to collect 5 snacks before you have run out of steps to take. You can collect snacks by completing assignments. Every assignment cards has 4 pieces of information:

- Which snack you can collect
- The location of the assignment
- The minimum required amount of players
- The minimum required amount of skill points



Before you can execute an assignment, you have to decide who is/are going to do the assignment. You have to decide this together! The players who are going to do the assignment have to be equal to or more than the minimum required amount of players and need to have the minimum required amount of skill points, or more. Players can thus add their skill points when working together.

Example: An assignment requires 2 players, 6 knowledge, 3 active and 1 creative points. Mark has 5 knowledge, 1 active and 3 creative points. Julia had 3 knowledge, 5 active and 1 creative points. Together they have 8 knowledge, 6 active and 4 creative points. They can do the assignment together!

When deciding which players are going to execute the assignment, you also have to watch who is close to the location since you only have a limited amount of turns available!

The game

During the game, you go over 5 steps over and over again:

1. The player whose turn it is takes the top card of the assignment cards deck and read the front. The back is not looked at yet, so put your hand in front!

2. Decide with the group who is going to execute the assignment. Take into account the amount of players, amount of skill points and location. Jullie

3. The chosen players move their pawn towards the location. During, you count the turns they have to take.

4. If all chosen players have arrived, you scan the barcode on the assignmentcard with the app and follow the instructions on the app.

During the game, the scanner notifies you of the next step.
If you have succeeded any assignment, place the card on the indicated place on the board. In this way, you can see at any time how many snacks you have collected! If you have not succeeded, place the assignment underneath the stack.

After this, the next player, clockwise, takes the next assignment card. The player with the most colorful shirt begins.

You can use the remember card to see the steps you need to take during the game!

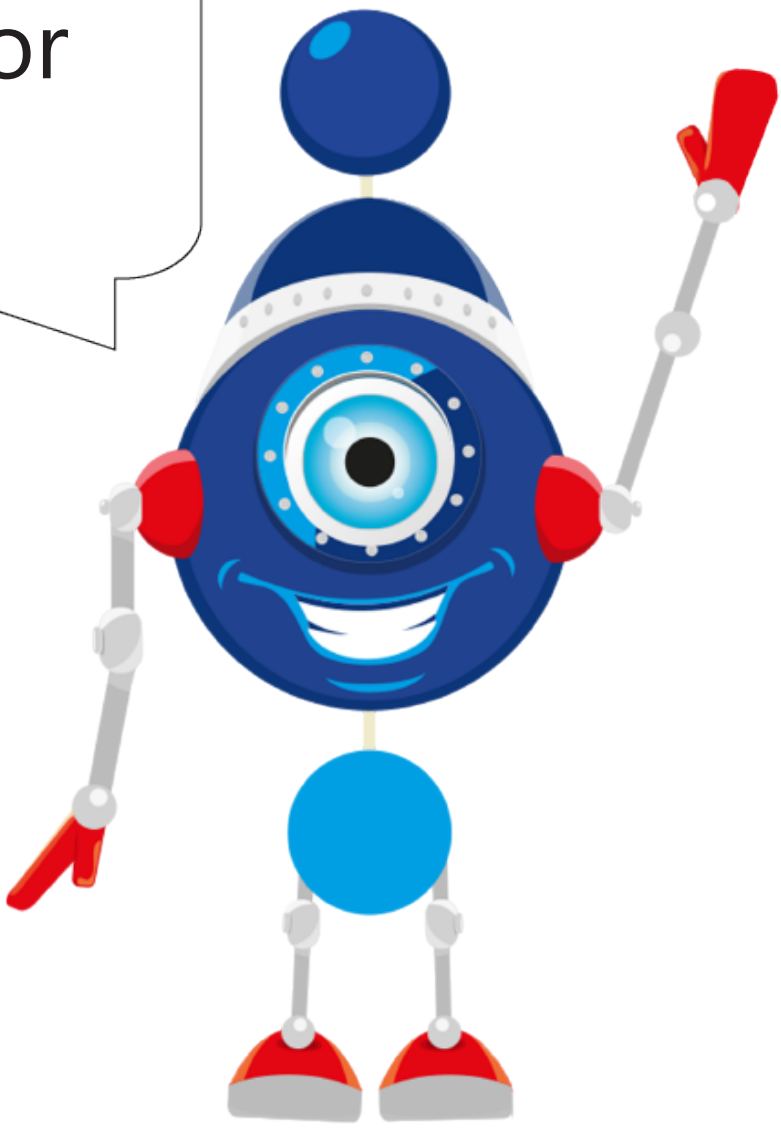
Situation cards

Every time you have used 5 turns, the scanner will notify you. At this point, you take the top situation cards, scans it and execute the assignment on there.

The end of the game

If you have collected 5 assignment cards before you have run out of turns, you have successfully helped teQ and you win the game all together!
If you run out of turns before you have collected 5 assignment cards, you have lost the game.

Thank you for your help!



O. Full explanation per social/emotional subsubcategory

Cat.	Sub cat.	Sub sub cat.	Type	Explanation/template	Example	Who	What does it mean?	+	+/-	-
Ego development	Independence	Without initiative nothing happens	2	Interactive assignments that require a lot of initiative (or no initative) to succeed	Assignment: the group has to count from 1 to 10, each number is said by 1 person. If people say something at the same time, they have to start over. They can not go twice or in a structure. (requires a bit of initiative)	Group	This depends on the type of assignment. In the example, if they fail, they show a lot of initiative. Since it is a group activity it can not be said if one player showed initiative or if the whole group did. If they succeed, they have not shown a lot of initiative, but again, this can not be scored on an individual level.	If the assignment is executed by three players and they fail the assignment	If the assignment is executed by more than three players and they fail	This assignment is not suitable to predict this.
			Other	The child that scans his/her card always first		Individual	In case one player (almost) always scans his/her character first when doing an assignment, this player shows a lot of initiative. However, if the first player differs every time, this does not mean that players do not show initiative, but can for example mean that they have agreed to take turns.	If one player almost always scans his/her character card first	This assignment is not suitable to predict this.	This assignment is not suitable to predict this.
			Other	Children who execute every assignment		Individual	In case one player executes (almost) all assignments, this player shows a lot of initiative. If each player roughly executes the same amount, nothing can be said about taking initiative.	If one player executes almost all assignments	This assignment is not suitable to predict this.	This assignment is not suitable to predict this.
		Problem solving	1	Situation in which the person has a problem, this must be a problem of his own. The answer possbilities must range from solving it yourself to letting someone else solve the problem for you.	Imagine, you come to school one day and you have PE that day, but you forgot your sportsclothes. What would you do? A. Try to borrow the clothes of someone else in school. B. Tell the teacher and find clothes together. C. Wait until you have to change clothes and wait for the teacher to say something about you not changing clothes.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he solves the problem himself.	If a player chooses the answer where he solves the problem with someone	If a player chooses the answer where he let someone else solve the problem or ignores the problem.
			Other	Problem puzzles/riddles created for children of their age.	https://interestingengineering.com/9-tricky-puzzles-to-test-your-problem-solving-skills	Individual	If the player solves the puzzle/riddle, he is good in solving problems.	If the player answers correctly.		If the player answers incorrectly.

Cat.	Sub cat.	Sub sub cat.	Type	Explanation/template	Example	Who	What does it mean?	+	+/-	-
Ego development	Self confidence	Knowing own qualities	2&3	If a players does an assignment alone and has high skill points for this type of assignment but fails, he might not know his qualities so well.		Individual	If a player has high skill points for an assignment but fails, he did not quess his skill correctly.	If the player succeeds		If the player fails
			2	Players have to decide for either easy or difficult. Since either way, the question is the same, this can be used as a control question.	Knowledge, category: topography. Question: What is the capital of The Netherlands?	Individual/ group	Whether the player chooses easy or difficult is an indication of how good he (thinks) he is in that category.	If the player answers correctly, it does not matter he chose easy or difficult.		If the player answers correctly, it does not matter he chose easy or difficult.
		Asking for help	1	Situation in which the person has an embarrising problem which they can not solve on their own. Embarrising because the core of asking for help here is whether the players dare to ask for help. Answers must range from easily asking for help to not asking help at all.	Imagine, you are invited to a sleepover at your friends house, but you get homesick really easy. What would you do?	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he asks for help	If a player chooses the answer in between of asking for help	If a player chooses the answer where he does not ask for help
			3	Whether players choose to use extra help.		Group	If players ask for help often, they do not have a problem with this. Since players have to estimate if they need help, if they don't, this does not immediately incidate that they are not daring because they can also just think that they can succeed without help.	If during the game, a lot of help is given		This assignment is not suitable to predict this.

Cat.	Sub cat.	Sub sub cat.	Type	Explanation/template	Example	Who	What does it mean?	+	+/-	-
Social development	Interaction with others	Contacting other players	Other	If players always execute the assignments in the same duos/groups, they do not contact each other very well.		Individual	If players always execute the assignments in the same duos/ groups, they do not contact each other very well.	If players differ in teams a lot		If a player always executes assignment with the same player, even though someone else was capable.
		Sharing experiences	Other	Situation card in which players are asked to tell a story about something, if they would like	Situatiekaart -> als je het leuk vindt, mag je nu een leuk verhaal over je favoriete hobby vertellen, scan je kaart als je dat doet (maar zonder consequencies dus)	Individual	If players choose to share a story, they are showing that their are willing to do this. Since it however is a voluntary assignment without any reward, if players not share a story this does not mean anything.	If players choose to share a story		This assignment is not suitable to predict this.
	Dealing with authority	Having respect for authority	1	Situation in which a form of authority takes a decision. This decision can be positive or negative for the players. The authority does not give any explanation. Answers focus on whether the players follow the instructions of the authority without saying anything or question their decisions.	Imagine, your mother and you are sitting on the couch. In front of you is a big bowl of your favourite candy. Your mother tells you that you can not have one. She than leaves the room to make a call. What would you do? A. Not take a candy B. Wait for her to come back to ask for a candy. C. Take a candy and hide the wrapper. D. Take a candy and leave the wrapper lying on the table.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where they respect the authority.	If a player chooses an answer in between of respecting authority.	If a player chooses the answer where they do not respect the authority.
	Taking others into account	Involving players in activities	2&3	If each player gets to execute roughly the same amount of assignments, they can very well involve everyone in the activities.		Group	If the players divide the assignments evenly, they involve each other well in activities. If the assignments are not divided evenly, it is likely that this is decided by one or two players, so this data can not be used for the group.	If all players roughly execute the same amount of assignments.		This assignment is not suitable to predict this.

Cat.	Sub cat.	Sub sub cat.	Type	Explanation/template	Example	Who	What does it mean?	+	+/-	-
Social development	Taking others into account	Helping others	1	Situation in which someone else has a problem and players must indicate whether they will help or not. Helping will not benefit the players and might even be questionable. Answers vary from helping to not helping.	Imagine, a girl from another school who you don't like falls of her bike. No one else saw, she also didn't see you. What would you do? A. Help her B. Run away C. Asking someone else to help her.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where they help	If a player chooses the answer where they sort of help or let someone else help	If a player chooses the answer where they do not help
		Choosing difficulty based on skills	Other	In the beginning of the game, the players choose their difficulty level. What they choose and if they pass this says something about how much they think they can.		Group	If players always choose the 'average' difficulty, they do not take into account their skills because they do not learn from their plays.	If players choose different difficulty with other players		If players always choose the same difficulty level
Emotion regulation	Dealing with conflicts	Explaining your actions	1	Description of a situation with a conflict of which the children must think of a situation that they experienced themselves. It must be very specific, but general enough that every child can think of a recent situation. Answers focus on how the child reacted on the situation.	Think about a recent conflict you had with a classmate during playing outside. What did you do after? A. The teacher had to resolve it B. We ignored each other C. We talked about it and made up. D. The problem just disappeared.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he explained his actions.	if a player chooses an answer in between solving his answer and not doing anything.	If a player chooses the answer where he did not anything to solve the fight.
		Making up with people	1	Situation in which there was a conflict. In order to assess this, the situation must be very clear and close to the children. This issue is about whether players are willing to make up with people, even though it might not have been there fault. So both issues where it was their fault as well as where it wasn't should be incorporated. Answers vary from making up to not making up.	Imagine, you promised a classmate that he could come to your birthday party, but you forgot to invite him. He asks you about it, what would you do? A. Ignore him B. Apologize C. Apologize and ask what you can do to make up to him	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he makes up.	if a player chooses an answer in between solving his answer and not doing anything.	If a player chooses the answer where he ignores the situation.

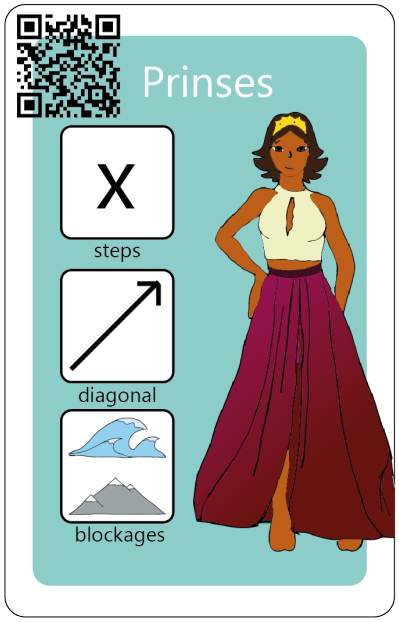
Cat.	Sub cat.	Sub sub cat.	Type	Explanation/template	Example	Who	What does it mean?	+	+/-	-
Emotion regulation	Dealing with conflicts	Making concessions	2&3	If the players do a lot of assignments with more people than they need, they can not make concessions very well.		Group	If the players do a lot of assignments with more people than they need, they can not make concessions very well.	If all assignments are executed with the required amount of players (if possible)		If most assignments are executed with more players than required, while this was not necessary for the skill points.
	Keeping things with yourself	Keeping a secret	1	Situation in which a player knows a secret. This can be a secret of someone he knows, or about someone he knows. It can both be positive as well as negative, but the consequences can not be explained.	Imagine, your mother is talking to a friend and you hear that a classmate of yours has to transfer schools because his parents are divorcing. However, this classmate doesn't know yet. What would you do? A. Keep it a secret. B. Tell only your best friend, she won't tell anyone. C. Tell it to anyone who wants to hear it.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he keeps the secret to himself.	If a player chooses the answer where he slightly spoils the secret.	If a player chooses the answer where he tells the secret
			Other	Situation card with information that the reader has to keep for himself in other to win something in the game later.	If you keep this a secret, you get 5 extra turns if you need them in the end. If you tell the others, you do not get the extra moves.	Individual	If the player tells the secret, he can not keep a secret	If the player succeeds to not tell the secret		If the player tells the secret
		Keeping your emotion for yourself	2	The assignment card must contain a text or image that evokes a certain emotion. The other players then must guess what emotion it is. If it is guessed, the assignment has failed. For the 'keeping emotions to yourself' the six basic emotions of Ekman (1999) are used; fear, anger, sadness, disgust, happiness and surprise.	Emotion: disgust. Imagine, you are sitting in the traind. A man across from you is sleeping and has a cold. Out of his nose grows a big bubble of snot, with little hairs and other black pieces. The bubble pops and the man startles awake. He looks around and slowly licks the snot from his upper lip.	Individual	If the player successfully hides his emotions that are evoked by the text/image, he can do this.	If the players do not guess his emotion.		If the players do guess his emotion.

Cat.	Sub cat.	Sub sub cat.	Type	Explanation/template	Example	Who	What does it mean?	+	+/-	-
Moral development	Right and wrong from your own point of view	Recognizing unfair treatment	1	A situation in which the player is clearly treated unfair, but without any reasoning for why that is happening. Situations can either be close to the player (friends, family) as well as far from them (nation wide). Answers focus on whether the players recognize the unfair treatment.	Imagine, your mother has 4 cookies left. She gives two to your father, keeps one for herself and gives 1 to you. What do you think of this? A. I don't mind. B. I wonder why I my father gets two, but eat mine and move one. C. I ask my mother why she gave my father two and only one to herself and to me.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he questions the situation	If a player chooses the answer where he questions the situation a bit	If a player chooses the answer where he does not question the situation
		Treating someone unfair and apologizing	1	Situation in which the player has done something wrong (which is clear from the explanation) but the reason why is also given. Answers focus on whether the player apologizes or not.	Imagine, your classmate has a really nice pen that you also want to have, but your mother won't let you have it. The moment your classmate goes to the bathroom, you take the pen and put it in your bag. What do you do next? A. You are happy that you now have the pen. B. You help your classmate look but do not say anything. C. You apologize and give the pen back.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he apologizes	If a player chooses the answer where he shows to feel guilty but does not apologize	If a player chooses the answer where he does not apologize
	Right and wrong for others	Recognizing unfair treatment	1	A situation in which someone else clearly is treated unfair, but without any reasoning for why that is happening. Situations can either be close to the player (friends, family) as well as far from them (nation wide). Answers focus on whether the players recognize the unfair treatment.	Imagine, your mother has 4 cookies left. She gives one to your father, keeps one for herself and gives 2 to you. What do you think of this? A. I don't mind. B. I wonder why I get two, but still eat them. C. I ask my mother why she gave me two and only one to herself and my father.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he questions the situation	If a player chooses the answer where he questions the situation a bit	If a player chooses the answer where he does not question the situation
		Standing up for someone else	1	A situation in which someone is treated unfair. This person can be someone close as well as further away. Answers focus on what the players does about it.	Imagine, you are playing outside with your friends until someone tells your friend that he can not play anymore. What would you do? A. If he says so, it must be right. B. I ask why he says that and try to convince him otherwise. C. I leave and go play with my friend somewhere else.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he stand up for someone else	If a player chooses an answer where he does something about the situation, but not really stand up for someone	If a player chooses the answer where he does not do anything about the situation

Cat.	Sub cat.	Sub sub cat.	Type	Explanation/template	Example	Who	What does it mean?	+	+/-	-
Moral development	Right and wrong for others	Understanding why someone did something wrong	1	Situation in which someone else does something wrong, but no direct reason is given. There might be some context for the children to think of an explanation. Answers vary from This person is wrong no matter what to I am sure he has a logical explanation for this.	Imagine, you are walking on the street and you see a hobo stealing a sandwich from a shop. Across the street walks a police officer who has not seen what happened. What would you do? A. The man must be hungry, I let him go B. I tell the police officer but beg him to only give warning because he must be hungry but is still wrong. C. I tell the police officer what the man did because he stole and stealing is wrong.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he understands why the person did something wrong	If a player chooses the answer where he understand the situation a bit but still questions it	If a player chooses the answer where he does not show an understanding of why the person did something wrong.
	Abiding rules	Following the rules	1	Situation in which a rule is explained. This can be a very logical rule (do not stand on the table), but also not so logical (no blue shirts on mondays). However, no explanation can be given, just the rule, since the children have to decide for themselves whether to follow and respect the rules, not matter how silly they may sound. The focus must also be on the rule, not on the person who set the rule since then it is about Respecting authority. Then, a situation is explained in which it would be beneficial to the player to break the rule. The answers vary from simply breaking the rule to following the rule.	Imagine, the school has a rule that states that you can not wear a blue shirt on mondays. However, all your shirts are dirty, except for your blue one. You can not borrow a shirt from someone else. What would you do? A. Wear your dirty shirt. B. Wear your blue shirt.	Individual	The answer that the player gives is a direct outcome for the measurement and does not have to be processed.	If a player chooses the answer where he follows the rules	If a player chooses the answer where he shows to understand that the rule should not be broken, but does not do anything about it.	If a player chooses the answer where he does not follow the rules

P. Card templates

Template



C=49, M= 0, Y=24, K=0
R=140, G=205, B=203

Karakter kaart

Nederlands voorbeeld

Karakter kaart

Engels voorbeeld

Character card

Dragon

2 steps

diagonal

blockages

Princess

3 steps

diagonal

blockages

Pirate

2 steps

diagonal

blockages

Unicorn

3 steps

diagonal

blockages

Wizard

3 steps

diagonal

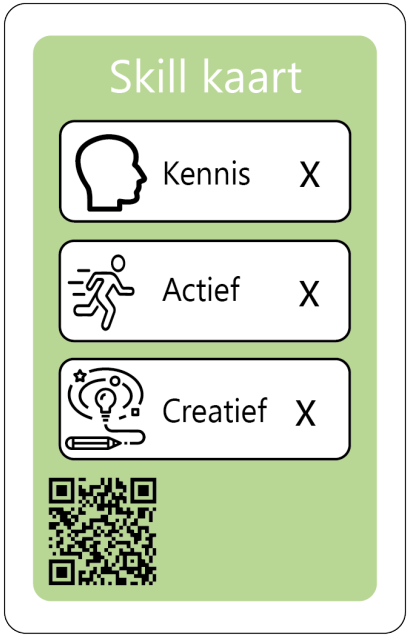
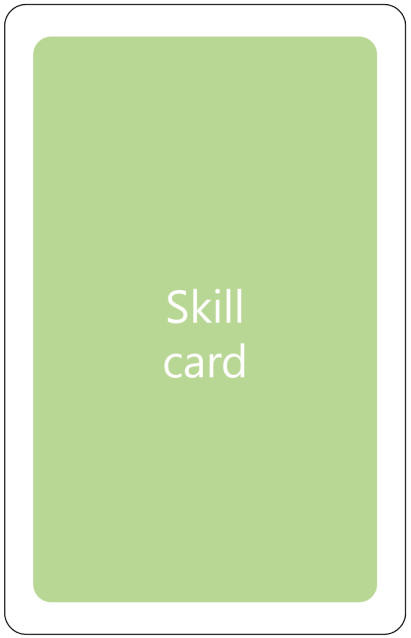
blockages

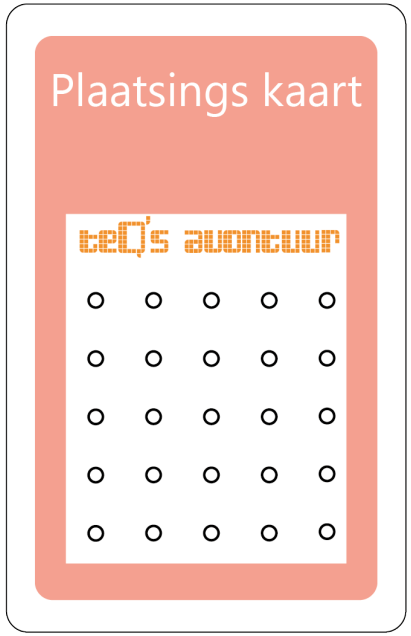
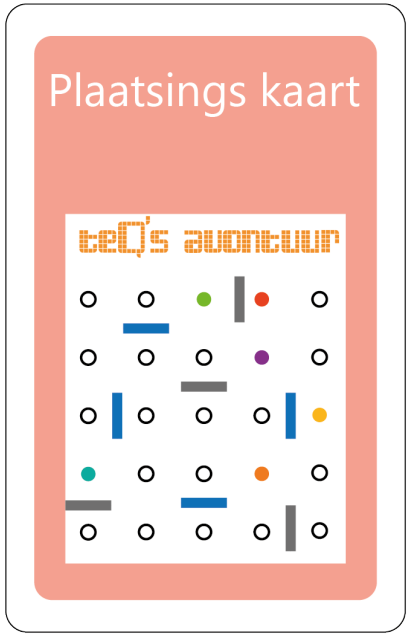
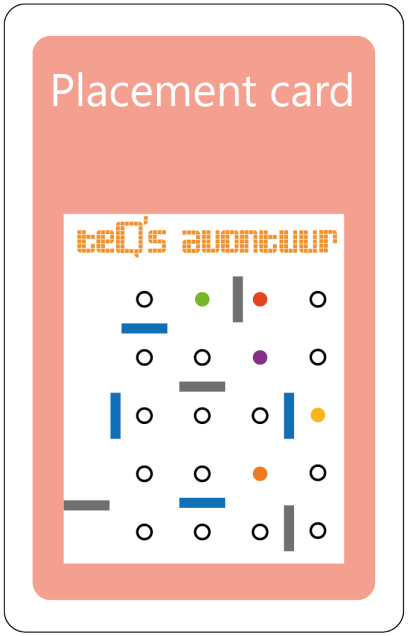
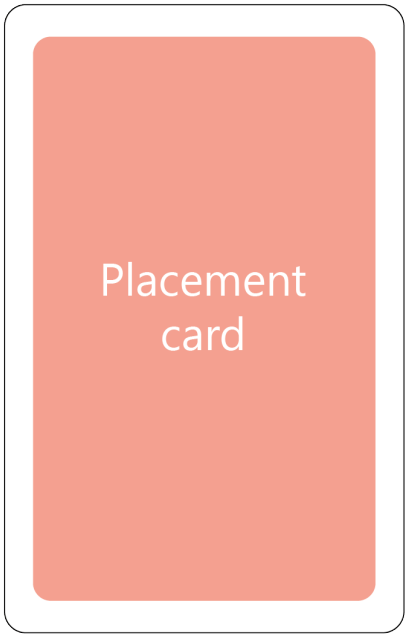
Mermaid

3 steps

diagonal

blockages

Template	Nederlands voorbeeld	Engels voorbeeld
		
 C=34, M=0, Y=53, K=0 R=185, G=215, B=149		
		

Template	Nederlands voorbeeld	Engels voorbeeld
		
 C=0, M=47, Y=38, K=0 R=243, G=160, B=144		
		

Template	Nederlands voorbeeld	Engels voorbeeld

Opdracht kaart

[afbeelding te behalen object]

[OBJECT - LOCATIE]

Kennis x
Actief x
Creatief x

x spelers

C=1, M=32, Y=48, K=0
R=247, G=189, B=141

Opdracht kaart

SUSHI - JAPAN

Kennis 1
Actief 5
Creatief 1

1 spelers

Assignment card

SUSHI - JAPAN

Knowledge 1
Active 5
Creative 1

1 players

Opdracht kaart

[opdracht]

Opdracht kaart

Sta voor 40 seconden op 1 been

Assignment card

Stand on one leg for 40 seconds

Template	Nederlands voorbeeld	Engels voorbeeld
Situatie kaart [beschrijving van de situatie]	Situatie kaart Aardbeving! Trek een nieuwe plaatsingskaart en verplaats alle blokkades zoals hierop aangegeven.	Situation card Earthquake! Take a new placement card and move the blockages as on the new placement card.
Situatie kaart	Situatie kaart	Situation card

C=27, M=47, Y=1, K=0
R=194, G=151, B=196