

First-aid: Heroes of Rescuville

Game Design Document



Version

2.0

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1. Summary

First Aid: Heroes of Rescuville is an engaging board game for children aged 9-13, offering a fun and interactive way to get introduced to the world of first aid. In this game, players collaborate to help the residents of Rescuville during their first-aid emergencies, all while being guided by the knowledgeable medical expert Dokter Janssen. This game experience is not only enjoyable but can also teach players first-aid knowledge. The serious goal is to instill in children the importance of first aid, teaching them the necessary steps and fostering teamwork and responsibility. First Aid: Heroes of Rescuville is not just a game; it is an educational tool that can be integrated into teaching curriculums, allowing teachers to introduce their students to the topic of first aid. Plus, it is flexible – suitable for both classroom use and independent learning, making it a must-have for every child's educational journey.

What sets this game apart is its vibrant visual style, diverse characters, and cooperative gameplay model, promoting strategic thinking and collaboration among players. The concept introduces a learning trajectory, ensuring adaptability for different knowledge levels. The game unfolds as young heroes embark on a mission, combining empowerment and excitement with the acquisition of practical first-aid knowledge.

Extensive work, including research, prototyping, and adult evaluations, has been undertaken. Future steps involve expanding emergency scenarios, streamlining cooperative goals, and conducting user testing with the target audience. The aim is to refine the game further, ensuring its effectiveness as an educational tool and enhancing engagement through increased visual appeal and storytelling elements on the cards.

2. Serious aspects of the concept

Serious goals and intended experience

The purpose of our game is to teach children from 9 to 13 years some of the basics of first aid and get them excited to learn about first aid. This means that the children learn something about the importance of first aid, the steps they need to take to do first aid, when and how they call for help, which situations they can see within an accident, etc. They learn how to respond in common first-aid situations and how they can cooperate when such situations happen. For example, situations like bleeding or burns. Children are important for the provision of first aid; teaching children first aid is essential to prepare them for dealing with the traumatic effect of an accident, which can hinder them from taking action when an accident happens (Lenson & Mills, 2016). The absence of first aid knowledge can lead to unnecessary injury, or it can cost people's lives. Children do a lot of physical activities, for example at schools or a sport where they can see a lot of accidents (Sharif et al., 2018). With this knowledge, children can make a crucial difference in critical situations, especially when professional medical help is not immediately available.

Within the game, a slight feeling of stress is intended for the players to resemble the pressure of acting in a first-aid situation. Another intended experience is the feeling of empowerment, calm, and teamwork as this teaches them to work together while staying focused and calm, just like in a real-life first-aid emergency. Thus, the theme makes first-aid education engaging, enjoyable, and memorable, promoting a sense of responsibility and empathy.

The player

The player of the game is between 9 and 13 years old and is a pupil of a Dutch elementary school. Nine-year-old students can already learn basic life support skills with success. This includes AED deployment, calling for help, and knowing the right recovery position (Fleischhackl et al., 2009). Children in the last two grades of elementary school are from the age of 9 to 13 years, after that, they will go to secondary school. The player will play the game in class at their school, in an educational environment, with their classmates to learn how to collaborate in first aid situations.

Emergency situations in real life are complex, so this game will also be a little more complex than the average card game. In addition, the game has a learning trajectory, so the first game might be a little hard, but after playing longer or more times, the game will get easier, and they see more progress. However, this does not mean that players need to be experienced players and as the game's intention is teamwork, players build on each other. The game's difficulty level is based on games with the same age range, which also contain a learning curve, such as Pandemic: Hot Zone (Leacock & Lehmann, 2021).

3. The story & theme

Story

In the heart of Rescuville, a vibrant city known for its tight-knit community, a group of young heroes stepped up to make a difference. Guided by their trusty character, Dokter Janssen, the children embarked on an exciting adventure to learn first aid. Their mission was clear: navigate the city and respond to various incidents that required first aid. Each challenge they encountered taught them valuable lessons on how to help others in need. From treating scrapes in the park, aiding in a bicycle accident, and even assisting someone with a sudden allergy, the young heroes learned by doing (when they have the knowledge to do so).

As they continued their quest, they encountered a variety of emergencies, all while gaining confidence in their first-aid skills. With each incident they responded to, they realized they were becoming true first-aid heroes. The children embraced their roles as lifesavers and finished their adventure with smiles on their faces, knowing they could make a difference in the real world. Dokter Janssen commended their efforts and encouraged them to share their newfound knowledge with friends and family.

Look & feel

The game's visual style is bright, colorful, and child-friendly illustrations. It's designed to be visually appealing to children aged 9-13. The illustrations are approachable, featuring characters and environments that resemble the charm of a storybook (see Figure 1). In addition, injuries and emergencies do not look too bloody and realistic for the players, while keeping it realistic enough, so the knowledge is transferable into real life.

The story takes place in the fixed space of a board, which resembles Rescuville. The city of Rescuville is depicted as a friendly city with various neighborhoods, and parks. In the heart of the environment is the Hospital where Dokter Janssen works. Lastly, the city has a 112 call center at the border. The board is not only visually pleasing but also serves the function of holding game elements. Players will walk around the board to help the citizens of Rescuville.

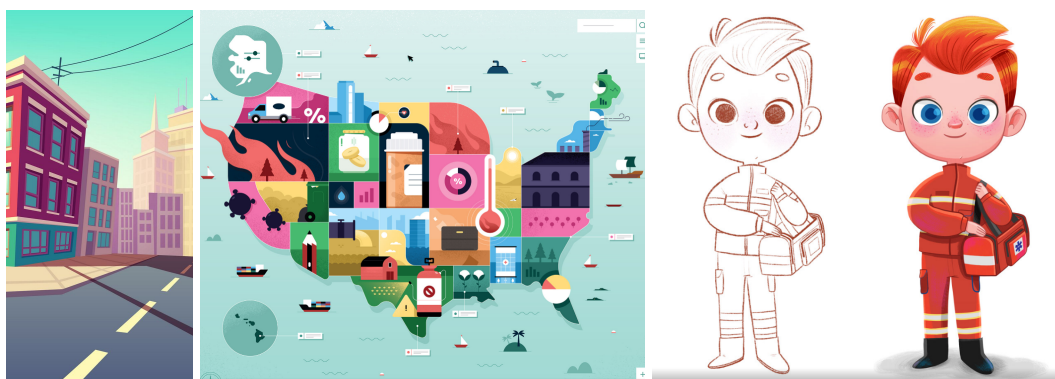


Figure 1a, b, c: Inspiration for illustration

The theme of becoming a hero through first-aid training is designed to inspire children to positively impact and help others. The visuals, characters, and environments are carefully crafted to create a sense of empowerment and excitement while teaching vital first-aid skills. The theme and intended player experience instill confidence in young players to respond effectively in real-life emergencies.

Characters

Players have a personal pawn, which resembles the hero they are in the game. They can control how their pawn moves, how many knowledge cards their character collects, and how they interact with other pawns (players). Next to controlling their pawns and interacting with others, players can also interact with the central character, Dokter Janssen. Dokter Janssen is a warm and approachable figure who works in the hospital. Dokter Janssen exudes a sense of trust and guidance, encouraging players to embark on their first-aid adventure with confidence. Players can interact with Dokter Janssen, who offers tips and instructions on applying first aid in various situations, which is done by giving the players knowledge cards. Dokter Janssen resembles a first aid course that players could follow in the real world, and the knowledge cards that the Hospital gives contain basic first-aid knowledge that players will read. By playing the game more and reading the knowledge cards each time players solve an emergency, the knowledge will sound more familiar and players might remember the information later on, which supports the serious game goal.

Players use their pawns to move around the game board. When a pawn reaches an incident, the player attempts to assist the injured character using first-aid. The characters requiring first-aid have diverse problems and represent a variety of ages and backgrounds, for example, Willem suffered from a scraped knee and Mrs. de Vries cut herself while making dinner. These characters are depicted on the emergency cards, which players read. They are designed to elicit empathy and a desire to help, encouraging players to practice first-aid skills to save the day. In addition, this variety of characters can help support the game's goal of getting players excited to learn about first aid.

4. Gameplay

High-level game flow

‘First Aid’ is a tabletop board game where players play the role of first-aid volunteers. The players walk around the city collecting knowledge cards and applying this knowledge to solve first-aid emergencies (see Figure 2). All players work together towards the main goal of this game: making sure every inhabitant of the city is safe. The players can reach this goal by solving first-aid emergencies (win conditions are discussed later on). The ‘First Aid’ board game falls under educational, cooperative, and children’s board games. Figure 3 shows the flowchart of ‘First Aid’.

Multiple elements can be used within the game to gain as many points as possible. The hospital and Dokter Janssen can be called, so players can collect knowledge cards. This is connected to the learning goal that without knowledge you might do more harm in an emergency, thus you should call emergency services. In addition, the cooperative game element of working together towards the goal and being able to interact with each other supports teamwork and a deeper level of game flow. As players are encouraged to think not only about their own strategy but also about the team’s strategy, strategic thinking and communication are stimulated. These game elements are brought to life through the players and the rules of the game.

Figure 2a

Map of the city V1

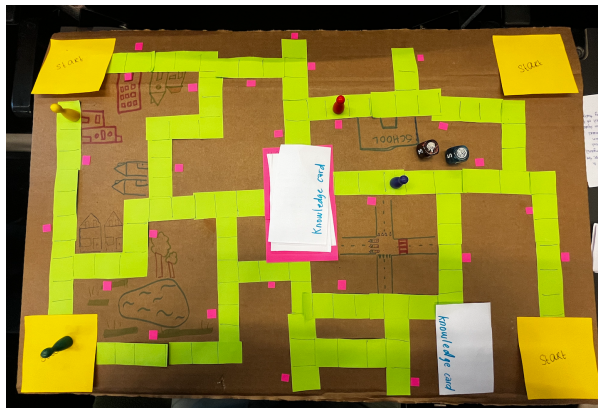
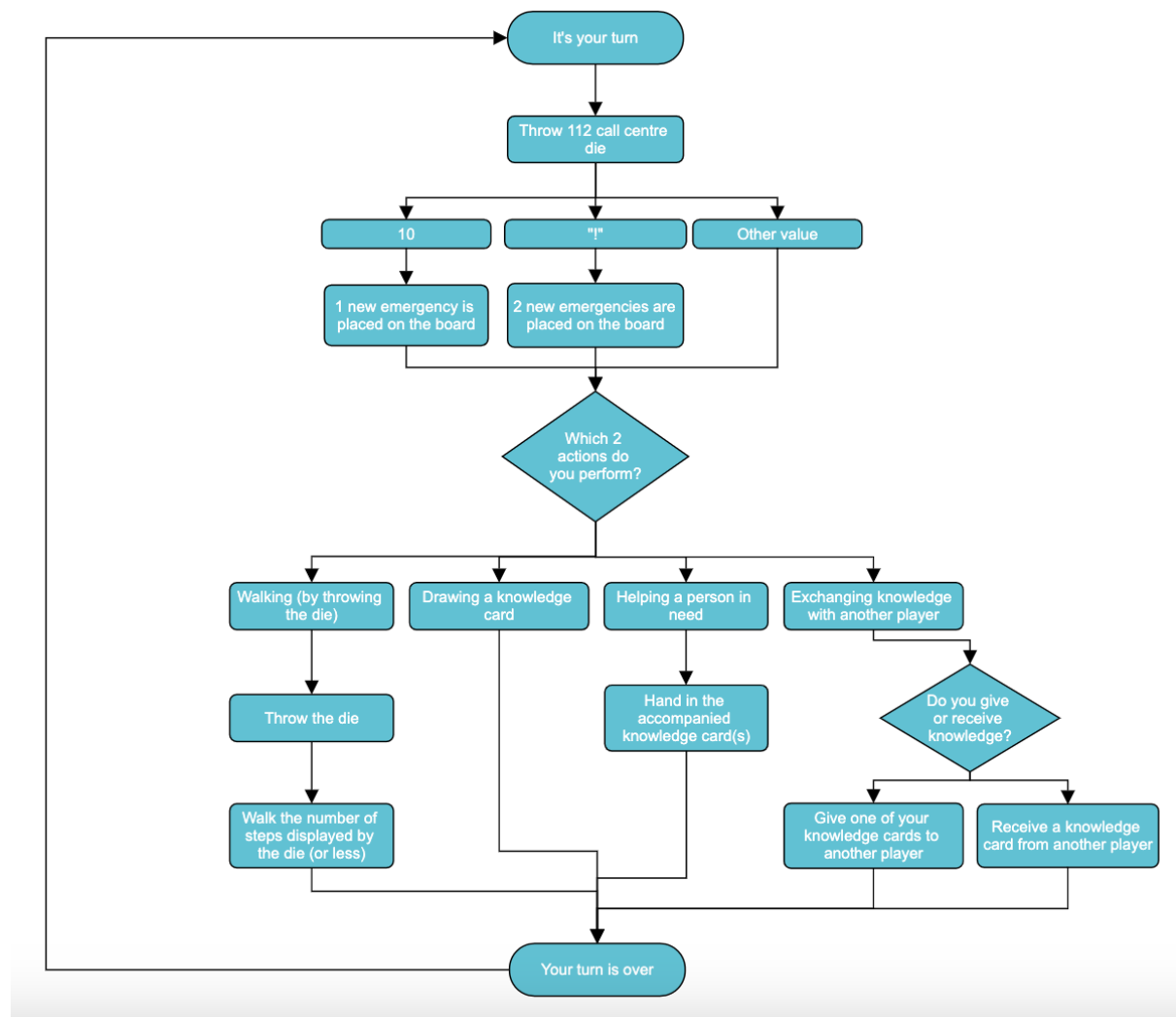


Figure 2b

Map of the city V2



Figure 3*Flowchart*

Rules

In this cooperative board game, players navigate Rescueville facing various emergencies, aiming to provide first aid and become the heroes of Rescueville. The complete rulebook, detailed in Appendix A, outlines both operational and constitutive rules integral to the gameplay.

Operational rules include that each player starts with a unique-colored pawn and 2 knowledge cards. Within a turn, players can choose two actions; from walking (determined by throwing two dice), drawing a knowledge card, helping a person in need, and exchanging knowledge with another player (limited to the same region on the board). When the player decides to resolve a first aid emergency, the knowledge card has to be read out loud. The board designates walking spaces, and when the game starts, 3 emergency cards are placed in predetermined parts of the city.

Constitutive rules involve emergency cards placed on the map through specific 112-dice outcomes (“10” or “!”). Additionally, players may need one to three knowledge card(s) that match the emergency to resolve it and help a person in need. The maximum hand limit for knowledge cards is 5, and players can move up to 12 steps by throwing the dice.

First Aid contains a recurring internal conflict for every player; when it is a player's turn, they have to decide which two of four actions to perform. For example, if the player helps someone by handing in a knowledge card and drawing a new one, the player is not able to move their pawn on the board or give a knowledge card to another player.

Since First Aid is a cooperative game, players can only win the game as a group. This winning condition is determined by the number of people the players were able to help and provide first aid to. If players can only help a low number of people, the winning condition will state that they did okay but they still have a lot to learn to be the heroes Rescueville so desperately needs. If players help lots of people, the winning condition states that they did great and are well on their way to becoming great first-aid helpers. See Appendix A for the specified numbers and winning conditions.

Consequently, if the players are not able to help people and provide first aid, there is no real harm to the inhabitants of the city, but the players do lose the game. This happens when 3 emergency cards are face-down on the board or all the emergency slots are full. Alternatively, the game also ends when there are no more 112 calls left (when the emergency pile is empty), signifying the end of the players' workday as the heroes of Rescueville.

Mechanics

First Aid features various mechanics, which offer multiple strategic possibilities for players to work together and win the game. One mechanic that introduces a sense of urgency and randomness is the 112 call center die. When the die lands on 10, 1 new emergency is placed on the board. When the die lands on “!” 2 emergencies are placed on the board. Players can choose where they put the emergency but must do so before they see the emergency. Whenever a new emergency is called in, the active player must read the emergency on the card out loud to let their team members know what the emergency is about.

Within the game, players can walk the board, collect knowledge cards, collect solved emergency cards that earn points, and exchange knowledge to support cooperative gameplay. To help remember the actions and how many actions a player has left, the board has a designation action slot (which was added in the final design, after evaluating the first version of the game). Here the board gives feedback to the player about the actions they can choose and how many they have left to put action tokens on. When walking, getting a high score with the dice will allow a player to walk further towards a first aid emergency and get the 'reward' of solving this emergency earlier. Drawing a knowledge card will give a player a random knowledge card. Thus, a player never knows what he will get, but players can always use a card later on or share it with another player if they do not need it themselves. Sharing it with another player strengthens the feeling of collaboration and the feeling of operating as a team. This will be rewarded as sharing a card with someone who needs it speeds up the

process of solving the emergencies, enlarging the chances of winning the game, and keeping players engaged. When solving an emergency, the knowledge card must be read aloud to report back to Dokter Janssen (a mechanic that was added after evaluating the first version). This in turn strengthens the knowledge of first aid of the players and causes the same knowledge to be repeated within the game, supporting serious game goals.

As the game progresses, players find some strategies to work in their favor. As the game has random components, it can be played multiple times. This creates a competitive attitude to keep improving the strategy each time, to get an even higher score. By making the feedback and reward system span across multiple game sessions, the game engages players to play again and again.

5. Diversity and inclusion

In the Netherlands, some primary schools offer first-aid training in the two final years of primary education (Group 7 and 8). First Aid: Heroes of Rescuville is designed to be a part of this curriculum, providing an engaging and fun introduction to first aid for children aged 9-13. The game is also suitable without first-aid training. Schools without the first-aid program and schools outside the Netherlands can also benefit from the game since the fundamental principles of first aid are universal and apply across cultures.

Admittedly, first aid can be a difficult subject for a younger audience. Some topics, including choking or CPR, can be quite intimidating for children aged 9-13. While developing the game, the team carefully considered all possible first-aid subjects. Research was done to make sure that our game would be informative and engaging and to avoid any disturbing content. Additionally, to adjust to the diverse knowledge levels and/or ages of the target group, we tried to keep the difficulty level balanced, covering specific topics.

Our team is approximately ten to fifteen years older than our target group. Therefore, it can be a challenge to grasp the imagination children often have. To overcome this aspect, we discussed multiple games suited to our target audience and did extensive research. The goal was to create a game that resonates with the imagination, curiosity, and learning style of children, fostering an environment where they can comfortably engage with and absorb first-aid concepts.

In addition, we used symbols and illustrations that are recognizable across different regions. This ensures that the visual language of the game is universally understood. Moreover, ensuring diversity across age groups and genders of the characters in the game enhances the game's inclusivity. This inclusion reflects the reality of diverse capabilities within the global population and promotes understanding and empathy. Overall, the game aims to reflect the global nature of health and safety, encouraging players to approach first aid with a broad perspective.

6. Evaluation

Prototype description

The prototype consists of three main components: the city map, the emergency cards deck, and the knowledge cards deck. The board of the game looks like a map of a city because the game is about emergencies in a city. With the details in the prototype, we tried to make it look like a map of a real city, so the player would recognize this. The road symbolizes the streets in a city and all the elements on the board symbolize places that are in a regular city, such as an apartment, a parking space, a park, a district with different houses, etc. In the middle of the prototype stands the hospital. This is the center of the board and of the game, and here is a place for the knowledge cards. The players have to call the hospital to get a knowledge card, and they can pick one of the stacks in the middle. The emergency cards are all over the board and have their own space on the board. Whenever an emergency is ignored (when a player walks past it or they are in the same place and cannot solve it that turn), a small block colored is added to the emergency card. The players had to play with just regular pawns in different colors, and they had three dice to roll with. One die for the 112 call center and the other two dice for the steps. All these elements contribute to the player experience to make the game feel more real and to let them experience that they are in a real city where they have to solve emergencies.

Approach

In the evaluation of the game, a deliberate approach was employed to measure both the overall game experience and the attainment of its serious goals. Although the game is designed for children aged 9 to 13, the game was evaluated using adults. As we cannot test the actual knowledge transference with adults, the focus was on the mechanics and the goal of the game.

To execute the evaluation, a group of four adult participants was introduced to the game rules, followed by a session where they actively engaged with the game while being observed (see Figure 4). Subsequently, a structured focus group session was conducted, during which participants responded to five specific questions designed to probe various aspects of the game experience:

1. What would you define as the goal of the game?
2. What did you find positive about the game?
3. What did you think about the playability of the game?
4. How did you experience the cooperative gameplay?
5. What would you improve?
6. Were the knowledge and emergence cards of the game clear?

The responses gathered from these questions collectively form the basis for assessing the game's success in achieving its intended goals. While acknowledging the inherent limitation of not directly assessing knowledge transfer due to the use of adult participants, this evaluation approach provides valuable insights into the game's mechanics and overall user experience, offering a foundational understanding of its effectiveness and areas for potential enhancement.

Figure 4

Results

The data collection process involved the presence of a notetaker during the evaluation session. The notetaker observed the players and documented their feedback. Several noteworthy observations emerged from the evaluation. Firstly, it became clear that players experienced a need for a comprehensive rule book at the onset of the game. The absence of clear guidelines led to a sluggish start as players struggled with doubts about what actions were acceptable in the game. Questions surfaced about the maximum number of cards that could be traded, as well as whether trading or merely giving was involved in these transactions. While collaborative gameplay quickly ensued, players required time to adapt to the cooperative element.

One striking observation was that players tended to skim the knowledge cards, focusing solely on the titles without delving into the content. As a result, they did not receive vital information about the solutions to the emergencies listed on the maps, hindering them from understanding a crucial aspect of the game's goals.

Nevertheless, positive signs of strategic collaboration emerged as players developed coordinated approaches to address emergencies, aligning with the intended design of the game. Feedback from players indicated that the goal of reaching 25 emergencies seemed hard and time-consuming. Additionally, players need to remind each other about the limitation of two actions per turn to prevent inadvertent rule violations. Another issue was that the regions were not clear enough to know when they could swap knowledge with each other. Conversely, feedback on the storytelling aspect of the game was positive, the players enjoyed the collaborative approach over a competitive one. While the cooperative goal was distinctly understood by the players, the learning aspect concerning the basics of first aid was less clear, because they did not read the information on the knowledge card about how to solve the emergencies.

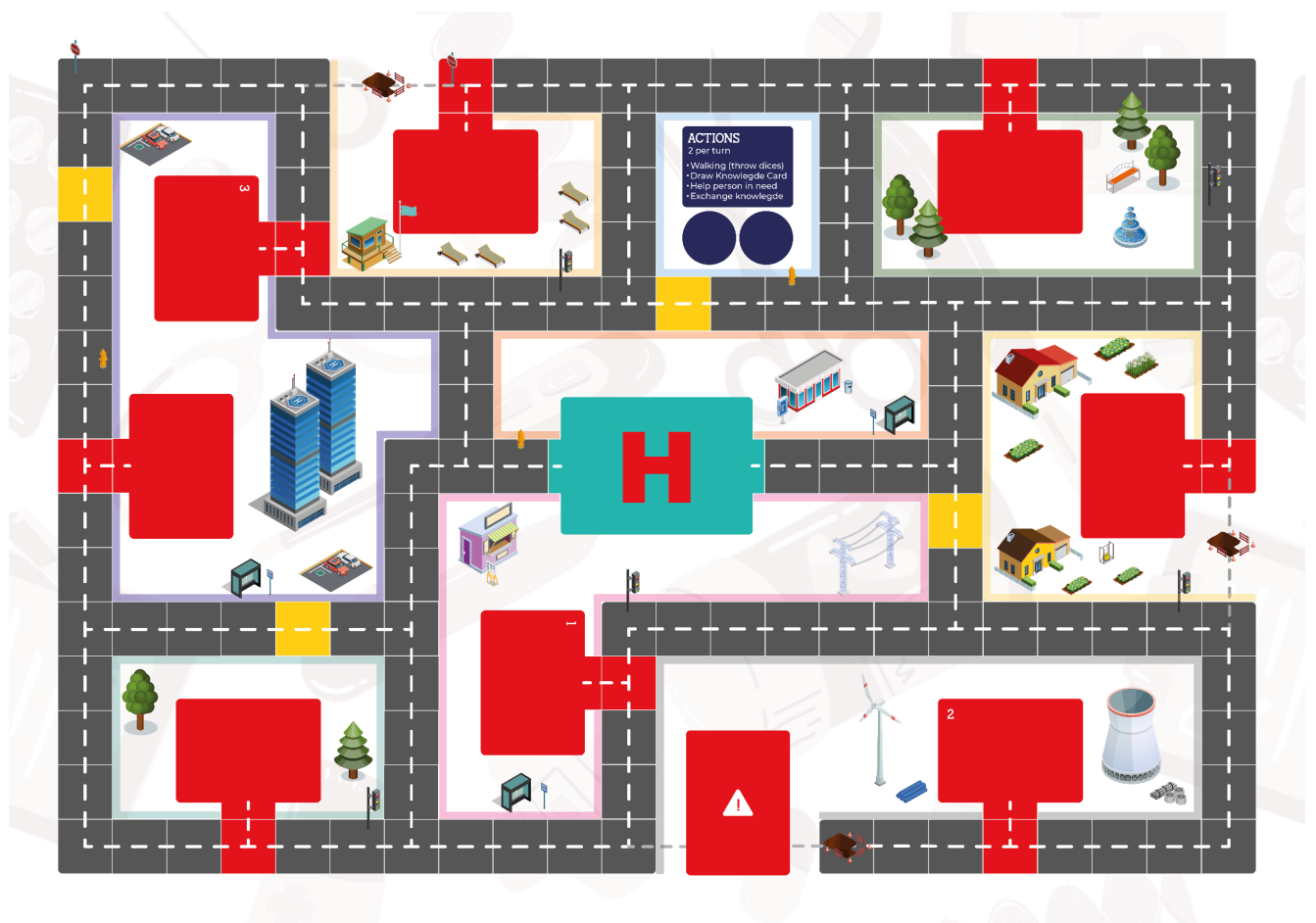
These observations provided insightful information about the experiences of the players and pointed out areas that could be improved in the game.

Final Game Design

The final game integrated three new elements based on the information gathered during the evaluation. To support the serious goal better, a rule was added where the players have to ‘report back their solution to the hospital’ and read the emergency card as well as the knowledge cards they are using to solve the emergency. In addition, to support memorization visuals are added to the emergency cards and we strongly recommend future iterations to also include visuals in the knowledge cards. Lastly, we noticed players having trouble remembering how many actions they have left and what possible actions there are. Therefore, we included a memory part on the board, with slots for action tokens to put whenever a player uses an action.

Figure 2c

Map of the city V3, final



Suggestions for future work

Various suggestions can be implemented in future iterations of the project to improve the gameplay aspects of “First Aid: Heroes of Rescuville.” Primarily, due to the circumstances, the initial evaluation involved adults; therefore, the next important step involves testing the game with the target audience (children aged 9-13). This will allow for a comprehensive and accurate assessment of the game's effectiveness on the target demographic. Observations from this testing will guide further refinements to the game mechanics, ensuring its resonance with the cognitive and emotional development of the children.

Secondly, collaboration with educators and first-aid instructors can be essential to integrate the game into existing first-aid training in schools. Gathering feedback from educators may contribute to improving the game's alignment with educational goals and curriculum requirements. This partnership could help ensure that play complements formal educational efforts and adds value to the overall learning experience. Additionally, a longitudinal study can be conducted to evaluate the long-term impact of the game on participants' first-aid knowledge and skills. Therefore, this evaluation may be important in understanding the lasting contribution of the game to the participants' first-aid skills.

Lastly, since the project preparation time was short, we could only add limited emergency scenarios. Including all necessary first-aid topics in the scenario is crucial to giving players a comprehensive understanding of first-aid situations. Scenarios should be carefully chosen to include a variety of injuries and medical conditions, ensuring players encounter a wide range of challenges that reflect real-world first-aid scenarios. In addition, including relevant illustrations in emergency scenario cards and knowledge cards to create a visual narrative can enhance the storytelling aspect of the game. Thus, this can help children better understand and retain first-aid concepts (Marchand-Martella et al., 1991).

In conclusion, these recommendations for future work aim to refine serious game aspects of “First Aid: Heroes of Rescuville.” By iteratively implementing these suggestions, the game can evolve into a more polished and effective tool for teaching first aid to children, aligning with the serious goals of the game.

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[https://doi.org/10.1016/s1130-8621\(18\)30028-7](https://doi.org/10.1016/s1130-8621(18)30028-7)

Appendix A: Rulebook

First Aid

Heroes of Rescuville

In the heart of Rescuville, a vibrant city known for its tight-knit community, a group of young heroes stepped up to make a difference. You are that group of heroes. Guided by your trusty character, Dokter Janssen, you embark on an adventure to learn first aid. Your mission is clear: navigate the city and respond to various incidents that require first aid. Each challenge you encounter will teach you valuable lessons on how to help others in need. From treating scrapes in the park to helping to fix a bloody nose, and even assisting someone with a sudden burn accident. You, the young heroes, learn by doing (when you have the knowledge to do so).

Let's help a city in need and make the hospital and Dokter Janssen proud!

Contents

1 board
40 Knowledge cards
24 Emergency cards
4 pawns



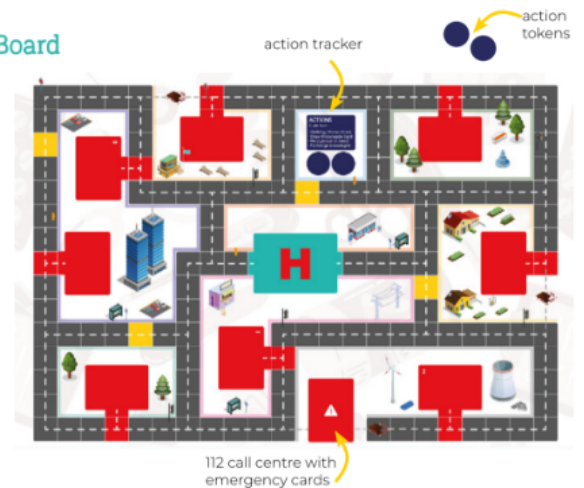
2 walking dice
1 die 112 call centre
2 action tokens



Preparations

1. Place the board on the table with the pawns in starting position on the yellow boxes.
2. Shuffle the knowledge cards and place them on the hospital on the board. Every player gets 2 knowledge cards.
3. Shuffle the emergency cards and place them face down on 112 call center on the board.
4. Turn around 3 emergency cards and place them on the emergency slots 1, 2 and 3.
5. The player with the last known use of a band-aid starts the game (if you don't know, then the youngest starts)

Board



On the board, there is a road that players can follow. In the middle is the hospital where Dr Janssen is working hard. The roads divide the board into regions. All places connecting to that space form the region

Player turn

Players play one by one clockwise.



Incoming emergencies

Before each turn, a player throws the 112 call center die (the one with the !).

- Rolled 2, 4, 6, or 8? there are no incoming calls, so no new emergency needs to be placed on the board.
- Rolled 10? 1 new emergency is placed blind on the board, players can choose where they put the emergency.
- Rolled ! 2 emergencies are placed blind on the board. Players can choose where they put the emergency.

Whenever a new emergency is called in, the active player must read the emergency on the card out loud to let their team members know what the emergency is about.

Actions

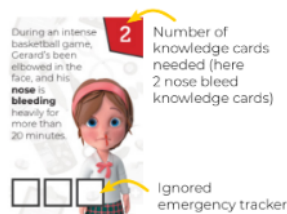
Each turn a player has 2 action tokens to use. Whenever a player uses an action, one of the action tokens is placed on the designated slot on the board.

Within a turn, a player can do 2 action out of the 4 possible actions:

- 1** Walk: Throw the dice to see your maximum number of steps. You can walk less places than your maximum
- 2** Gain knowledge: Here you can call the hospital to teach you some knowledge. Grab a knowledge card from the stack
- 3** Exchange knowledge: When two players are in the same region on the board, those players can exchange knowledge. They can do that one of these ways:
 - Give the other player a knowledge card
 - Receive a knowledge card from the other player
- 4** Solve an emergency situation: When you have enough knowledge cards in your hand to solve an emergency, you must report back your solution to Dokter Janssen. So you must read the knowledge card out loud to solve the emergency.

You place the used knowledge card(s) in the knowledge discard pile and the emergency cards into the solved emergency pile beside the board.

Hand card limit:
You can only have 5 knowledge cards in your hand. If you have more at any point in the game, you must discard cards.



Ignored emergency

Whenever a player cannot solve the emergency card and they are in the emergency place, a block is placed in the open square on the card. This means that the emergency is not yet solved and the matter is becoming more pressing to solve. Whenever a player walks past an emergency card within solving it, another block is added to the card. If an emergency card has 2 blocks on it, you need to discard an extra knowledge card to solve the problem. If the emergency has 3 blocks on it, and another player walks past the emergency without solving, the card is faced downwards (backside up). The players could not solve the emergency with the knowledge they had.

End of the game

If three emergency cards are placed face-down, the team loses the game.

If there are no more open spaces to put an emergency card, players lose the game.

If all the emergencies are drawn from the 112 call centre, the last player finishes their turn and the team can count their score.

Score

Count all the solved emergency cards (the emergency discard pile) minus the number of unsolved emergencies (the face down emergency cards). This gives you a score.

Team Efficiency is determined by the Hospital staff and the emergency patient satisfaction reference scale:

Points

0-3
3-6
6-9
9-12
12-16
16 +

Overall team efficiency

Horrible... The hospital expected more of your team
Mediocre, The hospital is not impressed and believes you still have a lot to learn
Honourable, the hospital is quite pleased, but still believes you can do more
Excellent, Patients are very happy and the hospital is too.
Amazing, the hospital is incredibly grateful to have you help first aid emergencies
Legendary, the city cannot imagine better first aid volunteers. They will remember you for a very long time.