

# GaGEN

## Methodological framework of the GaGEN game

Digital and  
Intergenerational-based  
Game for Environmental  
Education and Awareness



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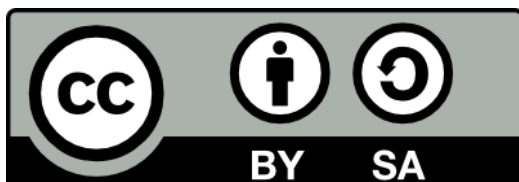
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# 1. Introduction

## 1.1. Context

The GaGEN initiative – Using serious games to engage cross-generations into awareness of climate change - aims to increase awareness of the impact of climate change in everyday living among kids and older adults, especially introducing the concept of circular economy in everyday life, as well as to increase self-awareness on the potential role kids and older adults have as change agents in climate change. In this context, it contributes to protecting the environment while recognising the value of intergenerational learning as a critical factor in Europe's value of solidarity, aiming to valorise the role that older people play in society by bringing them together with kids and by providing them with a creative game and relaxed atmosphere of collaboration and learning (GaGEN, 2022).

The specific objectives of the initiative include: a) To explore and develop the conceptual and methodological framework to combine the use of serious games in a digital and intergenerational format to raise awareness on climate change and circular economy; b) To design, develop and create a digital and intergenerational based game for environmental education and awareness, using the model of serious games, including specific instructions; c) To develop and implement a 'train-the-trainers' short course targeting educators, social practitioners on updating on the topics of intergenerational learning, integrated with the use of digital games and environmental education, via community spaces; d) To design, develop and pilot an intergenerational approach to the use of the game developed, targeting kids under 12 years old and senior citizens, using community spaces; e) To exploit the resources created across Europe, through a series of webinar in countries outside the partnership, using case studies, testimonials and records of the lived experience (GaGEN, 2022).

The proposals in this document for creating the game are the result of the information and data gathered through the initiative's activities to date. The partnership opted for a multi-method approach to build the methodological framework that will form the basis for the serious digital game on environmental education and awareness. This was based first on a literature review, national co-creation activities, and a transnational co-creation activity between the partners.

## 1.2. General goals: What? Why? For whom?

The GaGEN initiative aims to offer an intergenerational learning approach to environmental education by using serious games in a digital format and by increasing self-awareness of the potential role kids and older adults have as change agents in climate change (GaGEN, 2022).

The importance of GaGEN lies in its unique approach to environmental education. With the rapid advancement of technology and the pressing need to address global environmental challenges, traditional teaching methods still need to be revised to engage and inspire learners of all ages. GaGEN bridges this gap by leveraging serious games' immersive and interactive nature to create a **dynamic learning environment that can appeal to younger and older generations**. By promoting intergenerational learning, GaGEN encourages the exchange of knowledge, experiences, and perspectives between different age groups. This approach fosters collaboration, empathy, and a shared sense of responsibility towards the environment. Through the digital format, GaGEN ensures accessibility, scalability, and adaptability, making it a powerful tool for **reaching a wider audience and creating lasting positive change** (GaGEN, 2022). The choice of a serious game was due to its potentialities and benefits. In fact, games are structured frameworks in which participants engage in simulated competition under the control of a set of rules, culminating in a quantifiable outcome (Tekinbaş & Zimmerman, 2003) integrating technology into the game system when digital (Mcclarty et al., 2012). On the other hand, serious games are created with an educational goal instead of entertainment, unlike games intended for entertainment (Nazry & Romano, 2017). Games for behaviour change, persuasive games, and other terms are frequently used equally when referring to serious games (Antle et al., 2014). **Serious games are primarily used for game-based learning** but can also be used for other things like altering behaviour (Bogost, 2010).

The GaGEN game is design to be used by kids (up to 12 years) together with older adults. The game places a specific role for a facilitator, i.e., a professional or a volunteer that can provide support and help both generations, in terms of their interaction, the game's usability, but also to use the GaGEN game as a learning tool, an instrument for their activities with younger and older generations.

### 1.3. Outcomes of the game

By actively participating in the game, the **aim** is for players of different ages **to acquire and develop specific knowledge** on the subject, as well as to **adopt and/ or change some behaviours** related to sustainability and intergenerational learning. In this sense, we can see more specifically in the image below (Figure 1) the expected outcomes of playing this game:



01

Raise awareness on climate change and circular economy

02

Teach players how to be more sustainable

03

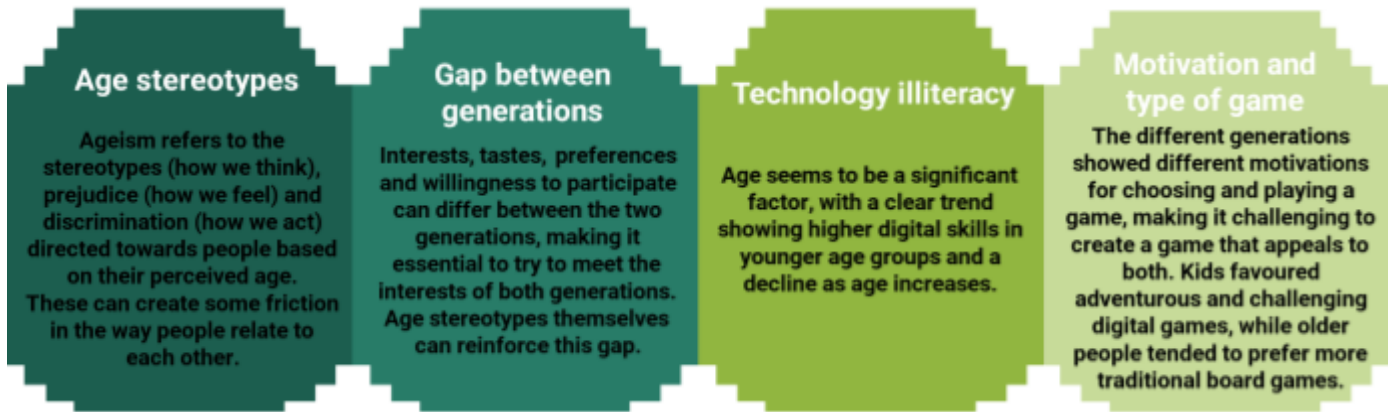
Foster connections between generations.

04

Create opportunities for

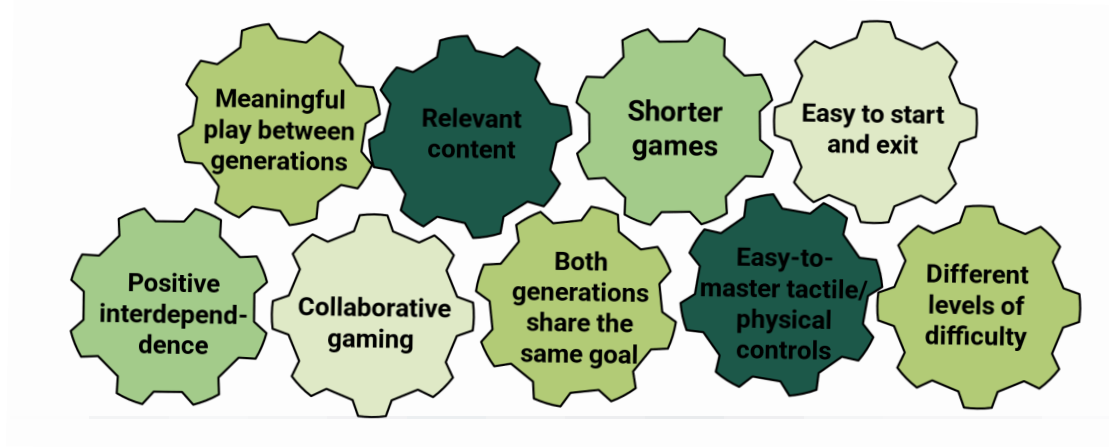
### 1.4. Challenges in implementation

Based on the literature review and national co-creation activities carried out by the partners<sup>1</sup>, we have realised that there may be some challenges to implementing the intergenerational digital serious game. These can be seen in the following Figure 2:



(WHO, 2021; Eurostat, 2023; Brzozowska, 2023)

However, we know that there are some factors that seem to promote the success of intergenerational digital games:



(Hera et al., 2017; Loos, 2014; Othlinghaus et al., 2011 ; Zhang & Kaufman, 2016)

Given these factors and considering that the game is intended to be a learning tool used by a facilitator, we expect these challenges to be reduced. However, it is essential to bear these in mind to develop a suitable game that meets the needs, tastes, and preferences of both generations.

<sup>1</sup> Find more information in the results section of the initiative's website: <https://gagen.eu/results/>



## 2. The game

### 2.1. Features

Based on the literature review, the selection of games that are examples of good practice and the co-creation activities that made it possible to gather specific information about the tastes and preferences of each of the target groups, it is proposed that GaGEN's intergenerational digital serious game should have the following features:

- Game structure: digital game that can be used in a face-to-face approach.
- Simple interface.
- Participants create an account.
- Multiplayer game – where players must interact and solve problems/challenges together (interdependency between ages). Collaborative digital game with positive interdependence between players of different generations. Teams can have a minimum of two players from different age groups.
- Introduction video/animation - Initial explanation of the game, introducing the environment and the player's role.
- Each player has a character they choose – It's essential to take representation into account while considering issues of diversity and inclusion. It's also relevant to create characters that players can identify with and see as role models. These are often suggested to motivate individuals to set and achieve ambitious goals (Morgenroth, 2015).
- Given the literature and the activities carried out by the partners, we opted to adopt the development of a "role-play simulation game" where avatars created by users can navigate. The world they are in has five different environments, each one of them corresponding to a specific mission. In that simulation world, they will find both tasks to be completed in the game environment as prompts for tasks to be completed in the offline world (mainly, these will require intergenerational contact).

### GAME FEATURES



- **Digital game that can be used in a face-to-face approach.**
- **Multiplayer** - collaborative digital game with positive interdependence between players of different generations.
- **Introduction video/animation** - Initial explanation of the game, introducing the environment and the player's role.



The GaGEN game aims to be a supportive tool for an intergenerational contact intervention involving older and younger people interacting co-operatively in tasks that encourage intergenerational bonding and understanding. Thus, like other intergenerational programmes, it becomes essential to be based on the *Intergroup Contact Theory* (Allport, 1954), seeking to bring two generations closer together to promote and facilitate a change in attitudes. This theory recognises that contact between two generations reduces prejudices and increases the accuracy of their perceptions of the other generation. However, for these results to be possible, programmes need to meet certain conditions, and in this sense, the game must ensure:

- The existence of **equal circumstances** for both generations.
- There must be a **common goal** between the players.
- Encourage **cooperation** between the two generations, promoting mutual help and sharing.

(Allport, 1954; Marques, et al., 2015; Pettigrew, 1998; WHO, 2021)

### *Definition of missions, challenges, and tasks*

## MISSIONS

each one placed in a different environment

A mission is an overarching quest, focused on one environment that has, attached, different environmental problems. It works as an umbrella for the activities. Each mission is constituted by several challenges and is achieved when all of them are resolved.

## CHALLENGES

A challenge is a big goal that can be achieved by completing several steps (tasks). It is something that we want to achieve and guides the action, but not the action itself. Each challenge is only completed when all tasks within it are done.

## TASKS

A task is a concrete action/activity that the user needs to perform to gain points. The accumulation of performed tasks leads to the completion of the challenge.. It needs to be something specific that the player needs to do, either face -to-face or online.

(adaptado de Dörner et al., 2016)

With the above in mind, it's essential to integrate these features into the game. At the same time, we have identified other structural characteristics for this game, namely:

- The game should be based on adventure and challenges.
- 4 missions + 1 special mission (can only be assessed when participants finish all other ones – this one could be regarding circular economy). Each mission is placed in a different environment referring to different climate change problems.
- Within each mission participants have 4 challenges to complete.
- Within each challenge participants have to complete different tasks that have different points – some tasks could be only virtual and other would require real life actions.
- Each challenge has different difficulty levels, as do the tasks, so players can experience progress in the game and feel fulfilled.
- As the game progresses, a few questions arise as a pop up (to reinforce and systematise knowledge).
- Interaction between older and younger players - The activities should be designed in such a way that completing a challenge requires the players to interact and carry out the activities together (each with the abilities that their character - i.e. older or younger - allows them. E.g., find hidden things, older players reach higher places while younger players reach lower places).

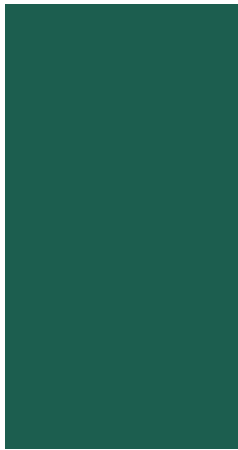
The structure of the GaGEN game is based on the following framework:



Figure 4. The five missions and their environments

Table 1. The respective challenges for each mission in the different environments

ENVIRONMENTS	Street market	Home	Urban area/small buildings/streets	Forest (or big park)/beach	Garage
CHALLENGES	<p>Pay attention to what you buy!</p> <p>Waste not, want not: pick your ingredients wisely and buy less.</p>	<p>The kitchen is the centre of a home: how can it be more sustainable?</p> <p>Hot and cold: don't forget about the energy and water</p>	<p>Sustainable mobility: move with style and awareness</p> <p>Speak up: You're not alone in the world</p>	<p>Clean Park, clean mind: let's do it!</p> <p>Protect the wildlife!</p>	<p>Let's circle it back: the benefits of the circular economy</p> <p>It's never late for a second chance: using, reusing, and repairing</p>



Thinking about goods for your home, but not for the garden? Think twice!

Go local: support your producers

Long day? Time to relax, but in a sustainable way.

Treat your waste!

Reduce your carbon footprint!

What has changed in your community lately? Can you help with that?

Leave no trace!

Everyone loves going to the beach - but are we treating it with love?

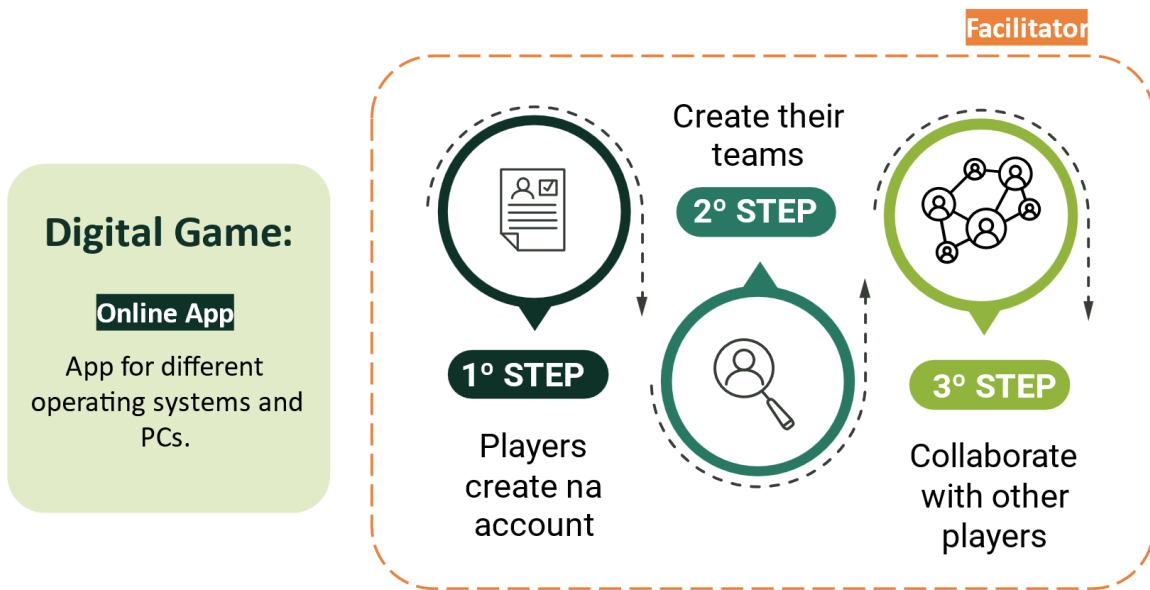
Second hand lover: reduce your waste and increase your wallet!

Ever thought taking a new hobby? What can you find in your garage to do so?

## 2.2. Channel to be used

The GaGEN initiative proposes an intergenerational serious digital game. The game shall be available in the form of a **digital online** to be played on a PC. Since the players are anticipated to carry out tasks in the “real” world, the game should also allow for this type of interaction. For this reason, having the app functionality makes it easier to upload information to the game as it's a more mobile option, leading players to realise and account for these achievements at the moment (i.e., it's more interactive). The game will allow players to interact and communicate with other players only within their teams so that they can collaborate and overcome the proposed challenges<sup>2</sup>. An option for pop-up messages with directive information/instructions should be made available for players; this is good for people who are not very familiar with digital games. Playing digitally should also be possible when different players are together in person, accounting for the facilitator to use it as teaching tool. These options will help reduce or even avoid technology anxiety (Khalili-Mahani et al., 2020; Zhang & Kaufman, 2016); since the older adult generation did not grow up with computer technologies, this might constitute a barrier to playing the game (Zhang & Kaufman, 2016), plus a digital game that an older player might need help understanding may be far too simple for a child (Hera et al., 2017). Lastly, the game design should follow easy-to-master tactile/ physical controls that offer diverse opportunities for playful interaction, eliciting high degrees of engagement for both generations (Hera et al., 2017) (see Figure 4 for a more schematic for the Game’s channel).

<sup>2</sup> All issues related to data protection and child protection will be safeguarded.



## 2.3. Reward system

As the teams complete the missions in the game, they will have access to surprise rewards. There will be different symbolic rewards:

- Each task completed allows players to gather points to finish each challenge – using a Progress Bar- Allows the user to situate themselves in the journey. Shows the progress of the user towards completing a task, challenge, and mission.
- For each mission accomplished, participants gain a reward.

### ❖ Badges for real life tasks

For the offline tasks set, players can earn special badges (identifies specific abilities of the user. Contributes to the narrative. Gives the feeling of public acknowledgement) for completing co-operative actions with people of different ages. One offline task will be embedded in each of the 5 missions. Each one will provide access to a specific badge:

Mission #1: Make better purchase choices.

Mission #2: Have a sustainable daily life.

Mission #3: Build a sustainable community.

Mission #4: Preserve natural environment.

Mission #5: Reduce, reuse, repair, and recycle.

## 2.4. Facilitator

The GaGEN game being a learning tool to be used in intergenerational interventions will be best used through a Facilitator. The facilitators are mainly adult educators, social educators, social workers, and many other social practitioners as well as volunteers, with experience, willingness, and interest in moving and implementing an intergenerational intervention to foster awareness on climate change using a serious digital game. To become a Facilitator of the GaGEN game, people need:

- To be an adult over 18 years old;
- To sign a Commitment of Honor in respecting and protecting the rights and humanity of participants, younger and older;
- To participate and successfully complete the GaGEN Facilitators' Training.

The **GaGEN Facilitators' Training** covers group management, intergenerational learning, climate change, and the game structure. The dynamic approach of the training will allow them to better understand their role as facilitators of the game, providing key knowledge/information and resources while raising their confidence in implementing this kind of initiatives with older adults and kids.

Facilitators will have the game instructions/guidelines to help them implement the game in their professional or volunteer settings. The facilitators will need to have a full understanding of their role; otherwise, they will not be able to provide the necessary support to the game players, and the GaGEN game's learning objectives – promotion of awareness on climate change and circular economy among older adults and kids – will not be achieved. Facilitators will also learn about the benefits of serious games, successful practices, and instructions on how to implement the game.

However, facilitators must have a basic to medium level of digital competencies to give the necessary support to the players of the game – older adults and kids. The facilitator should help reduce or even avoid technology anxiety (Khalili-Mahani et al., 2020; Zhang & Kaufman, 2016) for older and younger players. It is essential to highlight that age stereotypes can occur, becoming important for facilitators to keep this in mind and not let these interfere with their

actions. The Facilitators will be subjected to a pre and post test to detect their age-stereotypes, as well as their knowledge and confidence to perform their role.

The Facilitators will need to have as pre-conditions to apply and use the GaGEN game:

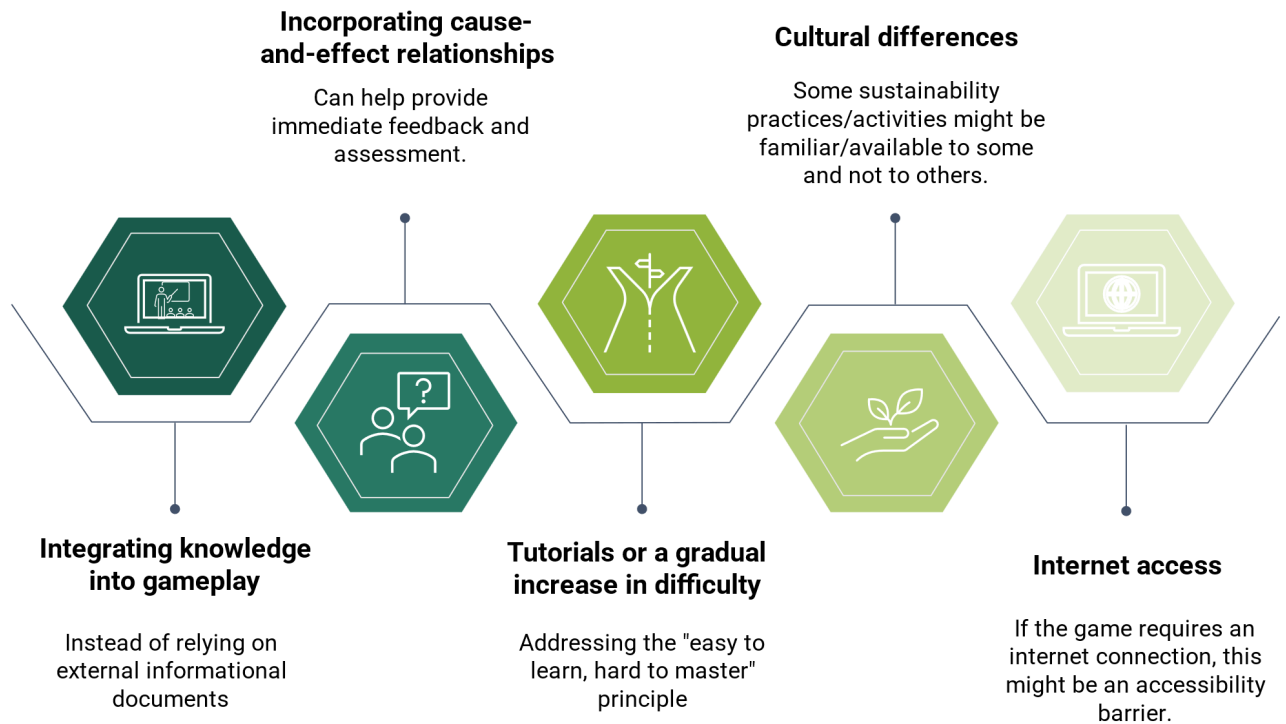
- Have as many digital devices as teams; when possible, smartphones for the use of the game app.
- Have internet available, broadband connection if possible.
- Have a large room with tables and chairs for participants.
- Have the authorization of legal representatives of kids (parents, tutors, ...) for their participation.
- Have the consent of the local facility in which they are implementing the intervention (e.g., a school, a day care center, a community lab, a leisure center, ...).
- Define an Intergenerational Protection Policy, covering the protection of both generations within the intervention.



### 3. Considerations

#### 3.1. Tips/things to bear in mind

The literature mentions that learning is most effective when it is active, experiential, situated, problem-based and provides immediate feedback (Boyle et al., 2011). In addition to the issues discussed above, there are also several issues that shall be considered within the methodological framework of the game:



#### 3.2. Ethical considerations

Regarding the creation and development of the GaGEN digital game, which will require people to create an account to access the game, this implies a few ethical issues to be considered, particularly given the target audience in question (i.e. underage children – it will be necessary a permission to be given by a legal responsible to create the account). To this end, a privacy policy will be drawn up which will include:



## PRIVACY POLICY

- The person responsible for processing personal data
- Personal data protection principles
- What personal data we collect
- The purposes for which the data is processed, why and for how long
- Sending notifications
- Security of the data subject's personal data
- Sharing the data subject's personal data
- Your data protection rights
- How to exercise your rights
- COOKIES Policy

Still concerning the data collection, it should be noted that data can be collected to evaluate the game and its effectiveness in order to define what are the suitable learning metrics (Catalano, 2014).

Nevertheless, presenting an informed consent is essential - Providing clear and concise information regarding data collection, user privacy, and any potential risks that could be associated with playing the game. Transparent communication enables trust, empowering players to make informed decisions about their engagement and participation.

Regarding violence and sexual and sensitive issues, there could be a report system in place. However, to avoid this type of issue, players can only interact with other players in their teams, which they define and are advised only to add people they know to their teams.

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