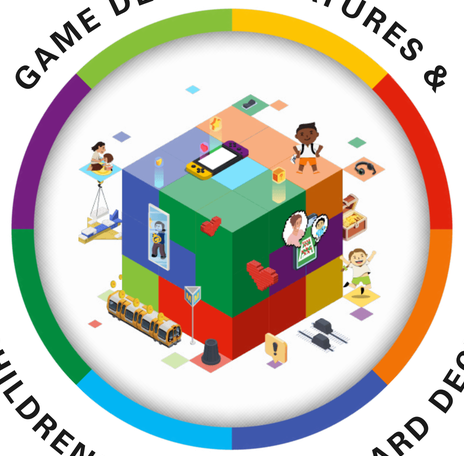
unicef
for every child

GAME DESIGN FEATURES & CHILDREN'S WELL-BEING CARD DECK



Designing to support children's well-being through digital play

If you're looking to add new game design features and want to understand the impact they may have on children's well-being, you can browse:

- The player experiences you are designing for, OR
- The categories of game-design features you want to add, OR
- Just view the full features list

More about RITEC

Part of the RITEC Design Toolbox, developed as part of UNICEF's Child Rights and Business workstream

Player Experiences

The RITEC-8 Framework Dimensions

Categories of game design features

Based on the RITEC research play sessions

You want to add one or more of these types of features to your game:

- Sensory Mechanics
- Progression Design
- Narrative
- Social Play
- Incentive System
- Character Design

Full list RITEC game design features

- **A** Aspiration | Avatars & NPCs
- **C** Caring for others | Challenge | Challenge development | Collectables | Creation | Customization
- **D** Decision making
- **G** Gloomy can be good
- **I** In-game communication | Intergenerational play
- **L** Levelled play
- **M** Multiplayer
- **N** Narrative choices
- **O** Onboarding | Optimal sensory experiences
- **P** Pathways | Play perspective | Player's decision making | Pleasurable features
- **R** Retry opportunities
- **S** Sensory variety | Single player games | Solo play | Success feedback
- **T** The power of smiling
- **U** Uncertainty

The RITEC project

The Responsible Innovation in Technology for Children (RITEC) project is a collaboration between UNICEF and The LEGO Group, funded by The LEGO Foundation. The project's primary objective is to develop, with children from around the world, a framework that maps how the design of children's digital experiences affects their well-being and provides guidance on how informed design choices can promote positive well-being outcomes.

The RITEC-8 Framework was developed to define children's well-being in digital play, by working with 787 children, focusing on those aged 8–12 years, in 18 countries (Albania, Australia, Brazil, Bulgaria, Chile, China, Cyprus, Indonesia, Iraq, Jordan, Pakistan, South Africa, Taiwan, Tanzania, Tunisia, the UK, Uruguay, the USA).

The framework presents eight dimensions that can support children's well-being: 1) safety and security; 2) diversity, equity and inclusion; 3) autonomy; 4) competence; 5) emotions; 6) relationships; 7) creativity; and 8) identities.

Important Design Guidelines

- No single game can do everything at once for all children, just as children do not all have the same needs.
- Not all games are equal in their potential to contribute to children's well-being.
- Different games may support different dimensions of well-being, depending on their design and use.
- In the RITEC research, digital play had the greatest well-being gains for children when it responded to children's deeper interests and needs. It is widely agreed that competence, autonomy and relatedness are universal needs. However, children have other interests, needs and desires that are also influenced by context and cultural factors (11 play drivers have been identified in the RITEC research).
- The RITEC-8 dimensions are **not a checklist** to be completed for each digital play experience. While safety and security are mandatory and diversity, equity and inclusion (DEI) is fundamental for children's well-being, the other dimensions stand on their own and support different aspects and digital play experiences. You may focus on one dimension or use a combination of a few of the dimensions. However, you should avoid creating games that negatively impact any of the well-being dimensions.

The design challenge is understanding what positive play experiences can look like for different children and what design choices or mechanics can support these.

Digital Play Drivers

'Digital play drivers' were identified through the RITEC research conducted with children and families. These are deep interests, needs and desires that were important in children's lives at the time of the study.

Fulfilment of these interests, needs and desires, including through digital play, supports aspects of children's subjective well-being. The more the digital play experience matched specific children's personal drivers, the more positive impact it had on their well-being.

The 11 digital play drivers:

1. The need to explore, construct and express **identities**
2. The need to experience, explore and negotiate **togetherness**
3. The drive to master **challenges**, including strategic challenges and puzzles
4. The need to understand, and meet, one's own **emotional** needs
5. The need for **sensory** stimulation, including emotion, humour and bodily movement
6. The need to exert and express **control**
7. The desire to explore and extend **ruling** passions
8. The desire to **collect**, curate and classify
9. The desire to **create**
10. The need to empathise, tend and **nurture**
11. The drive to acquire and perform knowledge and **skills**.

The capacity for some games to fulfil these interests, needs and desires may partially explain why children chose to play specific games or why some children found some games more supportive of their well-being than others.

These findings are particularly important for understanding how and why the relationships between digital play and well-being are different for different children. The digital play drivers may help designers to reflect on the particular interests, needs and desires they would like a specific game to cater for.

ACKNOWLEDGEMENTS

Acknowledgements

This toolkit was developed by Shuli Gilutz, Programme Officer, Child Rights and Digital Business, and Josianne Galea Baron from the UNICEF Business Engagement and Child Rights team (UNICEF Programme Group).

The development of this toolkit deeply benefitted from insights and collaboration from a wide range of stakeholders from industry, civil society, and academia. UNICEF would like to acknowledge in particular the contributions of Jon Mason (Jollywise), Lady San Pedro (Mrs. Wordsmith), Luc Delany (k-ID), Chris Lindgren and Petter Karlsson (TocaBoca), Kathryn Hymes (University of Oxford), Nathan Sawatzky (Supercell), Anna Wendelin, Ulrika Silfverstolpe (Mojang), Corinne Brenner (Killer Snails), Tobie Abad (TAKTYL Studios), Kiley Sobel (Duolingo), Tif Gagnon and Maria Janelli (Scratch Foundation), Barbara Leal (Futureplay Games), Stephen Boustred (Ubongo), Kimberly Voll (Thriving in Games Group / Brace Yourself Games), Raul Gutierrez (Tinybop Inc.), Glenn Gillis (Sea Monster, Games for Change Africa), Sabine Witting and Emma Day (Tech Legality), and Sonia Livingstone (Digital Futures for Children, LSE).

An enthusiastic thank you to our project collaborators: Jan L. Plass (New York University), Fiona Scott (University of Sheffield), Daniel Johnson (Queensland University of Technology), Amanda Third (Western Sydney University), Bruce Homer (The Graduate Center, CUNY), Sarah Jacobstein and Michael Preston (Joan Ganz Cooney Center), Christopher Payne, Marie Enemark Olsen, Mathilde Heegaard Bausager, Declan Henesy, Adam Ingle, Elizabeth Milovidov (The LEGO Group), and Lise Borgstrøm Henriksen (The LEGO Foundation).

We would also like to thank UNICEF colleagues for their reviews and contributions: Daniel Kardefelt-Winther; Afrooz Kaviani Johnson; Ida Hyllested; Stacie Finnegan; Jonas Ginge Andersen, Philip Toscano, Adam Cathro, Nicola Dillon.

We are grateful for the financial support from the LEGO Foundation for the development of this toolkit.

Design and layout: Jonny Harris Design

Copy-editing and proofreading: Green Ink

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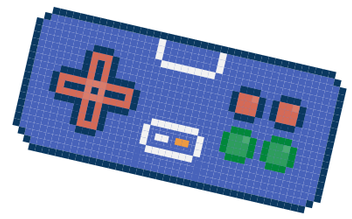
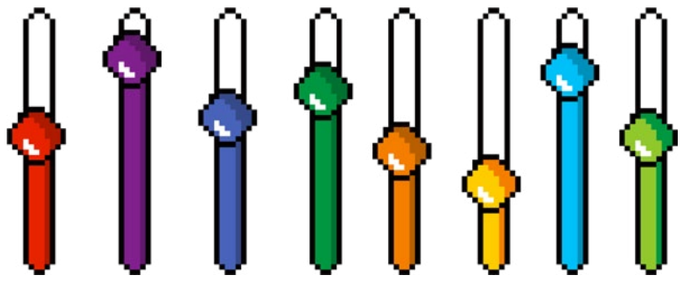




Safety and Security

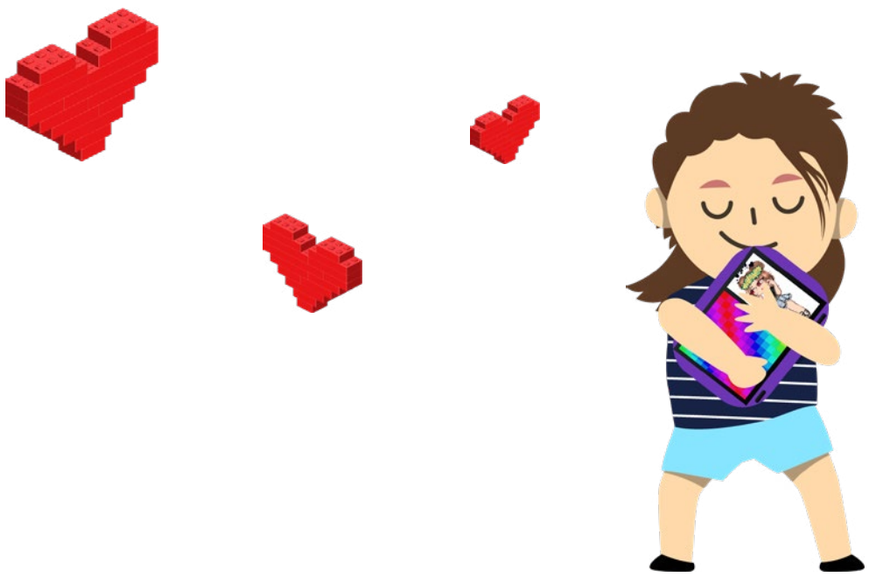
Children **feel** safe and are **kept** safe while engaging in digital play.

Safety and security are the foundation for well-being.

- Children should both **feel safe and be safe** while engaging in the digital environment and digital play. This includes safety from a wide range of risks, including contact risks, conduct, content and contract risks.
- Designing with safety and security in mind should always be a fundamental guiding principle of good digital design, not only for play experiences but all digital environments. Digital play designers must seek to design features that limit risks to children and must do the **utmost to ensure that their platforms are safe**.
- Be mindful that exposure to some level of risk – be it emotional, economic or physical – is sometimes unavoidable. An important additional consideration for designers might be how to best to help children **develop the skills and mechanisms** necessary to themselves avoid, or minimise the harm of, the risks associated with digital play.
- This is particularly important for children living in families where parents and/or caregivers, for whatever reason, do not have the capacity or knowledge to provide their children with **sufficient guidance** through their digital activities.
- It is important to consider the **age** of the children who a particular game is designed for; younger children tend to have less developed digital skills and a more limited understanding of what risky or harmful experiences look like and will therefore benefit from digital play environments that pose fewer risks (especially more serious risks like grooming or sexual abuse).
- When children felt safe, they were able to **better participate and enjoy** the benefits of the other game-design features that promoted the various dimensions of well-being.

This is enabled by allowing children to:

- Explore social connections, emotions and identities within safe environments.
- Enact control over how, when and with who they want to play.
- Develop critical digital literacy skills in relation to their digital play, for example an awareness of economic, emotional or physical risks, and protective coping strategies for when things go wrong.



Children's quotes from the RITEC research

"[The game should be] easily accessed without asking the player to buy/watch some ads; There should be no restrictions of the features that can be accessed."
(Small group, 7-11, Indonesia).

"[App designers need to] pay attention to the age of children."
(Small group, 12-15, Tanzania).

"It's like a safety blanket for her. It's her self-regulation, it's what she needs at this moment in time."
(Parent of Jemima, 10, UK)

"I think the thing we worry about with Roblox is the chat as well, there's a chat function. LEGO Builder's Journey seems like quite a safe game. I think it's quite good to kind of try a game that's got a bit of a different feel. A lot of the games he talks about and his friends play, they're a bit old really."
(Parent of Lewis, 8, UK).

FOUNDATIONAL DIMENSION

Working with children, it became evident that there are several conditions that are fundamental to the capacity for digital play to impact their well-being positively: children's safety and security, and their digital inclusion. Part of feeling both digitally included and safe and secure relates to how children's diversity and equity issues are handled within digital play experiences.

In the creation of the RITEC well-being framework children shared that they want digital content to be appropriate for their age, and for the digital spaces in which they interact not to expose them to violence, inappropriate language or sexual content. Children expressed that they did not appreciate coming across such content unexpectedly, and they want to be able to predict that the content they encounter will not be shocking to them.

Children want safeguards in place to ensure they can: manage advertising, chatting and trolling; socialise with peers of a similar age; and be supported to manage their time. Children's safety concerns were echoed by parents and flagged by stakeholders as an ongoing challenge.

When testing and validating the RITEC-8 dimensions in the second research study (P2 report), safety was therefore considered a baseline, rather than being tested. All the games used in the second study were safe, thus we found only a part of the game-design features that may affect safety for well-being. We recommend these as a key pointers, and as a starting point for designing to support safety and security for children's well-being. More can be found here.

Related game design features

In-game communication

Why should we design for safety?

Digital environments introduce new dangers both in terms of content and behaviours. Supporting children's well-being starts with protecting them adequately. Only when they feel, and are, safe, can children start to enjoy the benefits of other dimensions of designing for well-being.

Diversity, equity, and Inclusion (DEI)

Digital play experiences should feature **diverse representations** of childhoods and **serve** the **access** needs of as many children as possible.

DEI in the RITEC research draws on two broad areas:

- The **representation** of diverse characters (both player-controlled and computer-controlled) within digital games played by children
- The extent to which digital games played by children support the full engagement and **access** of, and well-being benefits for, a diverse range of children, including those with different bodies, physical and learning disabilities and differences, different material circumstances and different deep interests, needs and desires.

This is enabled by allowing children to:

- Feel represented. Designers of digital games should aspire to **diverse** representations of children and childhoods, for example through depicting different skin tones and enabling avatar customization to include wheelchairs and other assistive technologies.
- Access digital play equitably. Work to help children with physical impairments access digital games through adaptations. **Universal design** aims to serve the access needs of as many children as possible. These inculde physical needs, needs specific to learning, or needs associated with material circumstances. Design for the most vulnerable, and everyone will benefit.
- Designing for access may also refer to **technical challenges** such as not having constant internet connectivity for their digital devices, to the use of older and limited hardware, and for not having financial resources to pay for in-app-purchases.
- Children have a wide range of diverse **interests**, needs and desires and, as such, an abundance of different games, with a variety of game-design features, may be needed to support the different aspects of well-being.

Children's quotes from the RITEC research

"I used to be able to have a female character. I just want to know how to change the characters. People think that girls can't actually play games."
(Adaobi, 11, UK).

"[The game should be] accessible for all kids [so] all could participate and feel included."
(Small group, 12-15, Bulgaria).

"Include more languages for other kids too."
(Small group, 7-11, South Africa).

"[It's important for games to have] several types of skin tones, hair, nose shape, mouth shape, etc; have strong female characters, LGBT+; [and] offer several languages and [welcome] people from different countries."
(child, Brazil)

FOUNDATIONAL DIMENSION

Working with children, it became evident that there are two key conditions that are fundamental to the capacity for digital play to impact their well-being positively: children's safety and security, and their digital inclusion. Part of feeling both digitally included and safe and secure relates to how children's diversity and equity issues are handled within digital play experiences.

In the creation of the RITEC well-being framework children highlighted issues of diversity, equity and inclusion as factors in their digital play experiences, expressed in multiple ways. While research on digital play has traditionally focused on high-income and Western countries, this work is beginning to include the perspectives of children from low- or middle-income countries. While these issues are challenging both to encounter and to deal with from an industry perspective, it is also a space of great potential for companies to create diverse, equitable and inclusive experiences for children.

In terms of equity, digital inclusion issues are a key barrier to many children's capacity to derive well-being benefits from their digital experiences, including digital play. In consultations, many children stated that they could not access an internet connection and were thus precluded from playing many games. Others relied on mobile data, which quickly became expensive, so they refrained from playing games or using apps that are too data-intensive.

When testing and validating the RITEC-8 dimensions in the second research study, DEI was therefore considered a baseline, rather than being tested. All the games used in the second study were DEI-inclusive, thus we found only a part of the game-design features that may affect DEI for well-being. We recommend these as a key pointers, and as a starting point for designing to support diversity, equity and inclusion for children's well-being. More can be found here.

Related game design features

Sensory variety | Caring for others | Avatars & NPCs | Optimal sensory experiences | Player's decision-making

Why should we design for safety?

Inclusive digital experiences allow children from many backgrounds and contexts to participate, supporting human rights and ethical values and providing children with new experiences.

When children see themselves in the media, they can connect and participate and are more intrinsically motivated. A lack of positive representation can create the opposite effect.

Accessibility limitations in digital play add barriers to those children who may already be marginalised (physically, emotionally, or by social economic status). Therefore, DEI in relation to children's digital play is particularly important from a child rights perspective. Various forms of discrimination are still present in many online communities, and certain forms of identity exploration and expression are marginalised.

Autonomy

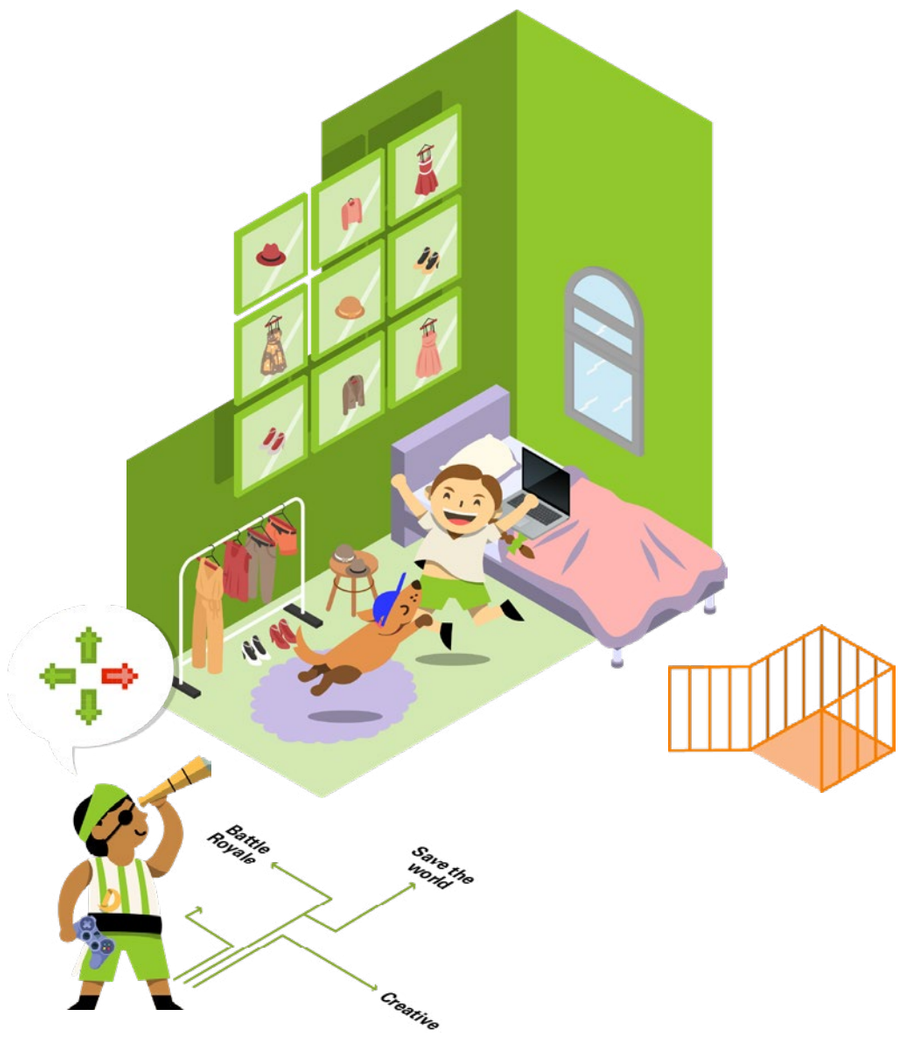
Children freely choose how to engage with digital play, and experience feelings of **agency**, **choice** and **freedom** while playing.

Digital play allows children to:

- Experience a **sense** of control and agency
- Have **freedom** of choice

This is enabled by allowing children to:

- Feel in control and make **decisions** about their gameplay
- Develop their own **strategies** to survive and progress
- Make decisions about in-game **behaviours** and actions that have consequences for their gameplay
- Engage in small acts of deviance, **testing the limits** of social convention
- Receive **positive feedback** on digital creations
- Explore and solve problems in the game, without one single **definitive** solution
- Make **choices** about how, when and what they build and create
- Customise their **avatar** or persona or other in-game objects in a range of different ways.

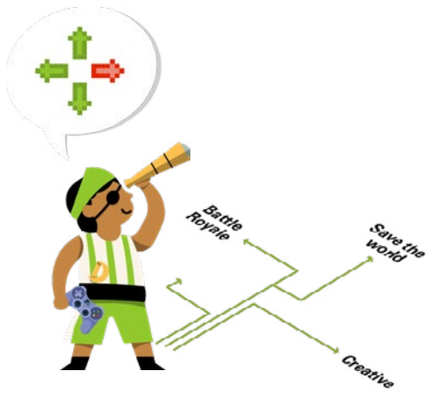


Children's quotes from the RITEC research

"It makes me feel free! Finally! I'm like Charlie dog when he's just been let out of his cage after six hours. Freedom!!"
(Penny, 9, UK).

"Creativity. Updates. Lots of other modes. You can do whatever you want. Anything! You can do deathruns, you can do building mode, you can do anything!"
(Malik, 12, UK)

"[Our game is designed] to make people feel that they have things under control and that they can face the challenges."
(Albania)



"You can create your own reality/world."
(Small group, 12-15, Brazil).

"Gives opportunities for a child to make different choices."
(Small group, 12-15, Bulgaria).

Related game design features

Choose your own adventure
Collectables **Pathways**

Why is autonomy important for children?

Having a sense of control, agency and choice can be beneficial even for very young children.

It has been associated with many important outcomes, including academic achievement, perceptions of inequality and fairness and general well-being as measured by positive effect.

Autonomy has been positioned as a basic psychological need, enabling children to have agency and make meaningful choices and is necessary for both motivation and psychological health to flourish.

Competence

Digital play experiences contribute positively towards children's perceptions of their effectiveness, ability and skills, facilitating a **sense of mastery.**

Digital play allows children to:

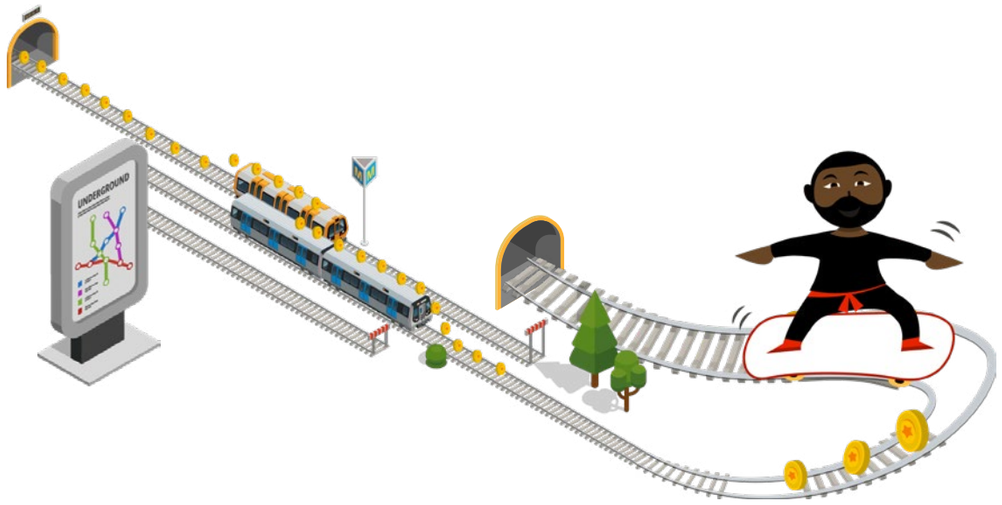
- Experience **mastery**
- Feel they can **achieve**

This is enabled by allowing children to:

- Experience **progress** and be meaningfully rewarded/praised for advancement through, for example, markers of improved performance in the form of points, scores or goals
- **Build** or create, ranging from building with blocks through to customizing/personalizing avatars
- Continually **adjust** their in-game strategies, based on what they learn
- Overcome **challenges** with particular activities and pass levels
- Engage in **sustained practice** of new skills/competencies to overcome challenges and experience a sense of getting better at something
- **Incrementally** master small components of strategizing, planning, creating and building
- Foster **knowledge acquisition** and **skills building** in something that is personally meaningful to them
- Partake in activities that interest them and to identify and explore their **intrinsic motivations**
- Engage in aspects of game play that support them to **persevere** with and overcome challenges.

Children's quotes from the RITEC research

"I like it because every year, for a week there is a week in Minecraft when you can play with your friends for free. I felt really nice. Because I want to think that I put in much effort for that game, for what I built. I like building huge houses and it takes me a lot of time to make them. I'm proud of what I did."
(Liana, 10, Cyprus).



"Subway Surfers is my favorite game because it helps me to concentrate sometimes. It also helps me to do better, like never give up. And try again. Even if it's hard. Try again and again, until I get it."
(Nkosinathi, 11, South Africa).

Related game design features

Player's decision making | Sensory variety | Collectibles | Optimal sensory experiences | Success feedback | Creation | Challenge development | Levelled play | Onboarding | Retry opportunities | Intergenerational play | Aspiration | Uncertainty | Challenge | Pathways

Why is competence important for children?

Building new skills and knowledge in life is key to children's well-being. Their perception of competence refers to a belief that they can develop, learn and achieve a given goal if they work on it. They can complete specific tasks, experience increasing independence, and feel satisfaction from their capability.

Competence has been positioned as a basic psychological need and is often considered an important aspect of psychological well-being, including for children.

Perceptions of competence can be specific, for example being confident in one's ability to complete a particular homework assignment, or more generic, such as being confident in one's general ability to socialise.

Emotions

Digital play experiences allow children to experience and recognise a **range** of emotions and provide opportunities to learn how to **regulate** them.

Digital play allows children to:

- Experience a **range** of emotions
- Be **aware** of their emotions
- **Regulate** their emotions

This is enabled by allowing children to:

- Experience positive forms of **calm**, quietness and escapism, enabling children to de-stress
- Enjoy pleasant music or images that contribute to positive **mood** and relaxation
- Sometimes experience negative emotions, including fear, risk and frustration, in a safe context, and build **resilience** and the skills necessary to deal with them
- Find **off-ramps** when negative emotions arise
- Be in control of the **tempo** of the game
- Turn a game off and have a **break** when the need arises (without losing progress or achievements, like streaks)
- Continuously engage without interruptions, leading to **flow**-states where they become immersed in a feeling of energised focus, full involvement, and enjoyment in an activity
- Provide **sustained attention** for neurodivergent children and children with disabilities.

Children's quotes from the RITEC research

"When I play Descendants Roleplay, it makes me feel excited. When I go on it I'm excited to see if there's any updates or if I can discover some new secrets in it. I feel excited to see if I can find the secrets."
(Annie, 10, UK).

"I think it does have benefits for his well-being because if he dies or when he loses, it's hard for him to cope. He gets upset. He's working on this kind of resilience and figuring out how to respond with that stuff doesn't quite go as expected."
(Parent of Miles, 6, Australia).

"Goat Simulator makes me feel happy inside. If I'm feeling angry, sometimes I just go headbutt a tree or something."
(Jane, 9, Australia)

"[Playing games] makes me [feel] relaxed... [as] it distracts me from real life problems."
(Bulgaria)

Related gameing features:

Avatars & NPCs | Play perspective | Aspiration | Optimal sensory experiences | Onboarding | Pleasurable features | Uncertainty | Multiplayer | The power of smiling | Retry opportunities | Challenge | Gloomy can be good | Anticipation | Solo play | Collectibles | In-game communication

Why is experiencing and regulating emotions important for children?

Emotional regulation is the process of monitoring and managing heightened emotions in a given context. Engaging in play, including digital play, provides children with an opportunity to practice and build emotional regulation and can provide avenues to process important emotional events. Children experience a range of emotions, such as frustration, joy and disappointment, through play, which can help them to develop the skills needed to recognise and respond to their emotions.

Children are inherently social and generally share a desire to connect with others. Social functioning, which is fundamental to well-being and includes making and maintaining friendships, depends on the development of emotional awareness.

Being able to regulate emotions has been linked to a variety of outcomes such as social functioning, school readiness and emotional well-being.

Relationships

Digital play experiences facilitate **social connection** with others and a sense of belonging, both in-game and outside of games.

Digital play allows children to:

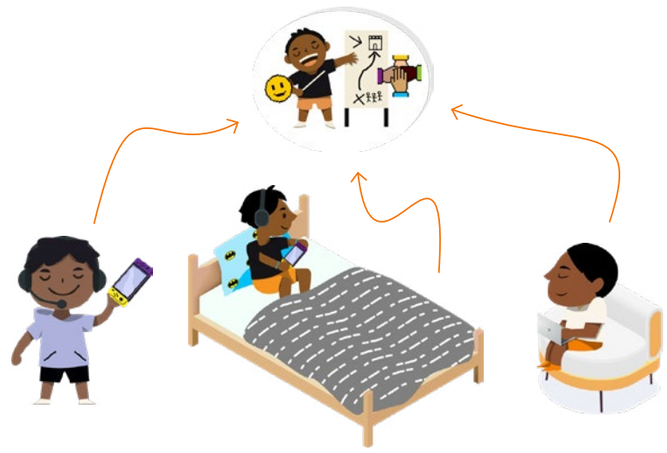
- Experience **connectedness** with others
- **Manage** social connections
- Feel that they **belong**
- Be **aware** of others.

This is enabled by allowing children to:

- Make new friends, and **socialise**, compete, create, share and/or collaborate with people they don't know face-to-face
- Socialise with, compete, create, share and or collaborate with other **family** members or others who are important to them
- Be part of a **team** that works together to achieve shared goals
- Learn to **communicate**: Teach others or share information about how to play or how to succeed at different activities
- Be part of gaming **communities**, both online and in person
- Meet other children in **similar** life situations: Provide a space for children with disabilities or who are neurodivergent to meet other children with similar circumstances
- Engage in mutually enjoyable **intergenerational** play within families
- Exert control over who they play with and when, including being able to play **alone** when they want to
- Care for, and **nurture**, others, including imagined others such as non-playable characters.

Children's quotes from the RITEC research

"I can play with my school friends. If we have a plan for what we want to do at school, we go to Fortnite, play one round and while we're playing the round we'll chat about our plan."
(Dylan, 7, UK).



"I like the horses, they're just really sweet. Every time I take them to a village they go straight into the carrot patch and eat the carrots." [showing the potential for connection with others, including NPCs
(Hailey, 10, UK)

"I can go to settings and just turn multiplayer off, so Mummy and Yara can't join me. I can just get rid of it."
(Pinar, 9, UK)

"Union makes power. Facing challenges together we are stronger."
(Albania)

"We help each other as one team."
(Small group, 12-15, Jordan)

Related gameing features:

Single player games | Intergenerational play | In-game communication | Success feedback | Avatars & NPCs | Solo play | Creation

Why is fostering and managing relationships important for children?

Social connection is one of the most important factors of well-being in a child's life.

From infancy, children are wired to connect – first with their caregivers, then with peers, and ultimately with communities.

Connection involves interacting and communicating with others as well as establishing and maintaining relationships.

'Relatedness' has been positioned as a basic psychological need, and strong social connection predicts a range of positive outcomes, from physical health to academic achievement.

Creativity

Digital play experiences encourage children to be **curious** and use their **imagination** to **build**, **invent** and **experiment**.

Digital play allows children to:

- Be open to a **range** of experiences
- **Imagine** different possibilities
- **Create** possible futures
- Act on **original ideas**
- **Make** things

This is enabled by allowing children to:

- Exercise different forms of creativity in the game, for example by **creating** characters, artworks or narratives
- Freely explore or solve problems in a multitude of ways, affording children a lot of leeway to **experiment** with game mechanics
- Provide flexible game settings and interesting narratives and characters that children can engage with in with openness and **curiosity**
- Exert choice and agency, for example in customization, **design** and decoration.

Children's quotes from the RITEC research

"You need to create things and try to figure out a way around things. I guess that game was designed so that everyone plays differently? You can create anything at all using this ultra hand tool. There's no one way to do things. You could go anywhere, you could go to four places or you could explore… each way kind of links to a story makes the experience really fun."
(Ethan, 12, Australia).

"I made a rollercoaster that went under water, and it went all over the place. And then I made a really long one all the way to a village. And then also in that village I made some statues of villagers."
(Ollie, 8, UK)

"[Our dream game] pushes children to be creative to make the strongest dragon."
(child? Indonesia).

On Minecraft: "[Our game] develops creative thinking and imagination. Looks like LEGO construction sets [where] you can create everything you wish."
(Small group, 12-15, Bulgaria).

Related game design features

Decision making | Avatars & NPCs | Collectables | Pleasurable features | Creation | Pathways | Sensory variety | Uncertainty | Narrative choices

Why is creativity important for children?

Creativity is the capacity for coming up with novel ideas and solutions. It often involves combining existing items or concepts in new or surprising ways and is characterised by using thinking strategies that expand possibilities and decision-making processes.

Creative development can be encouraged and taught – or discouraged and inhibited – through experience. Environment influences creative output, and research shows that children are more creative when they are specifically encouraged to come up with original ideas.

Pretend play, storytelling and role-playing with peers encourage fantasy and make-believe, giving children a chance to adopt varied roles and transform objects into props and take on different roles. In this respect, imagination and play are precursors to fully developed creative capacity.

Identities

Digital play experiences provide children with opportunities to **explore**, **construct** and **express** facets of themselves and others.

Digital Play allows children to:

- Construct, express and explore **individual**, and **collective** or future identities
- **Experiment** in collecting, curating and representing yourself with objects in the game
- Connect digital play with broader career aspirations, **interests** or hobbies

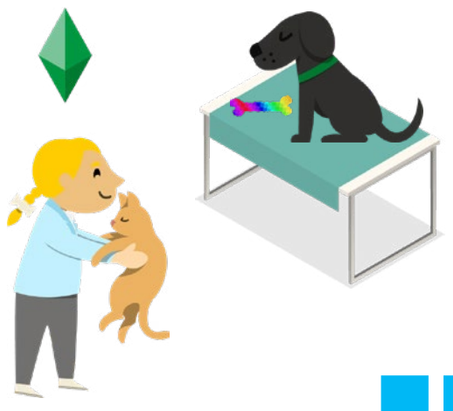
This is enabled by allowing children to:

- Explore imagined futures and real-life identities and careers by content topics and game mechanics that **mimic real professions**: for example, architect, designer, producer of media, programmer or veterinarian.
- Explore emergent personal identities with **customizable avatar** features that afford exploration with a variety of external identity elements, from different hair, make-up and clothes, to genders, ages, ethnicities and abilities.
- Explore collective identities through their digital play by allowing players to join online teams together, in different gaming genres and **communities** as well as real-life communities.

Children's quotes from the RITEC research

"Soccer's my life! Every week you have to change one or two players and then if they score a goal that gives you points. Just me and my daddy versus each other, and we're also in one league of all of our people in our Christian congregation."
(Mount, 10, South Africa).

"Sims is like… you pretend to make yourself older, make yourself look older so that you can make your ideal career and how you want to look when you're older, so you can pretend to live that life. I put the Vet career, I opened a Vet clinic. I had long blonde hair and I had 3 cats."
(Willow, 11, UK).



Related game design features

Decision making | Solo play | Customization | Narrative choices | Multiplayer | Avatars & NPCs

Why is exploring and expressing their identity important for children?

A child's identity emphasises a sense of uniqueness: a combination of experiences, interests and attributes that together form their sense of self.

Forming a personal identity is a lifelong process, to understand your own needs, desires and goals. Navigation of these developmental tasks has long-term implications for child well-being and future adult functioning.

Children in our research said that the cultivation of self-confidence, self-acceptance and a sense of purpose was important for their well-being. These are all aspects of a child's identity that are shaped throughout childhood.

Early research on digital engagement suggested that for adolescents in particular, the digital environment can be "A stage for experimentation and exploration in a time of intense interaction with people and new ideas that adolescence represents". Research on identity formation has shown potential for digital spaces to promote self-discovery, by allowing hidden or unexplored aspects of their identity to emerge by engaging in role-playing and experimenting. Children's experiences of identity and its interactions with digital games are closely linked to matters of diversity, equity and inclusion.

Sensory Mechanics

Sensory mechanics involve various sensory modalities (visual/audio/haptics) that serve a purpose in the game mechanic, to provide information to the player or to which the player is supposed to respond.

Sensory Mechanics' Game Design Features

- Sensory support to player's decision-making
- Features that are pleasing in and of themselves
- Optimal sensory experiences
- Physical & sensory variety

Incentive System

Incentive systems are the aspects of the game, including rewards and challenges, that are used to influence and guide player behaviour, for example, by motivating and encouraging the player to engage. Player motivation may be intrinsic or extrinsic. Both are affected by the game design and the player's personality.

Incentive System Game Design Features

- Success Feedback
- Creation & Customization
- Collectables
- Anticipation
- Challenge
- Aspiration

Social Play

Social play means play involving other individuals, either in collaboration or competition. Games that offer the opportunity to connect with others through and around the play of your game can improve well-being. Different levels and modes of social play afford different well-being gains.

Standard multiplayer formats are not the only way to support positive social experiences for all children at all times. Children need both social and solo play opportunities and, for some children, what 'social' looks like is complex and, perhaps, surprising (for example, anonymous trading with others can be an important and relatively safe way to learn about cooperation and collaboration in digital play, as can caring for imagined animal friends).

Social Play Game Features

- Multiplayer
- Family play
- In-game communication
- Solo play
- Social play with single player games

Narrative

A narrative is a story or a description of a series of events, told in a specific way. Adding a narrative to your game, either as the main mechanic or a supporting one, can support different players' motivations, emotional experiences and other well-being dimensions. Narrative design can include story and plot, characters, dialogue, world building and player interaction.

Narrative Game Design Features

- Choose your own adventure
- Caring for others
- Gloomy can be good
- The power of smiling

Progression Design

Progression design is the sequencing of the player experience and related game events based on a specific design goal. Providing your players with a sense of progress and indications of when and how they are progressing can support perceived competence, motivation, autonomy, and therefore well-being.

Progression design Game Design Features

- Onboarding
- Uncertainty
- Challenges development
- Pathways
- Retry Opportunities
- Levelled Play

Character Design

Create player characters (avatars) and non-player characters (NPCs) that support DEI, creativity, and identities.

Character Design Features

- Avatars & NPCs
- Play perspective

Sensory Mechanics

Feature Focus:

Player's decision-making

Various sensory features (visual/audio/haptics) are used to inform and impact players during the game. The decisions that players make allow exploration and progress – and sometimes failure – in the game.

Do's

- Use sensory feedback to provide players with important **information** for decision-making, such as the strategy (e.g., the scale of an encounter with other characters/NPCs) or discovery (e.g., proximity to important locations).
- Ensure the decision-making **experience** is within the cognitive capabilities of the child to make them feel competent, provide opportunities for creativity, and give them a sense of agency.
- Consider providing options to engage with information in different modes to cater for children with different needs. For example, games that rely on sound as a core game mechanic (e.g., warning of incoming danger) are **inaccessible** to deaf children or those with hearing loss, but the option to turn on alternative visual cues would make play possible.
- Consider designing the decision-making process including metaphors or examples of different real-life skills. For example: cooking or building houses. This provides opportunities for children to explore **different roles** and identities through the decisions they make about actions within the game.

Don'ts

- Don't **overwhelm** players with visual, auditory or haptic output that may severely impede their decision-making process (may vary by age/context/motivations/ability).
- Make sure the sensory output doesn't **distract** from the gameplay.

Related to play experiences:

Competence **Autonomy** **Creativity** **Identities** **DEI**

Examples from RITEC research

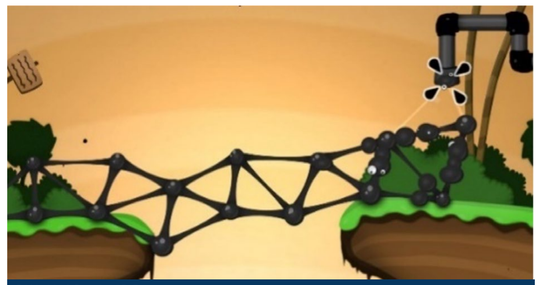
Plants Vs. Zombies

There are different types of Zombies that attack in the game. Visual features show zombie types, pleasant sound cues provide players with important **information**, for example about dangers.

© Plants Vs. Zombies, by PopCap games

World of Goo

In World of Goo there are both visual and auditory outputs in the game that support the player's **discovery** and decision-making in the main game mechanic: finding and building solutions to advance in its virtual world. This was a player's solution to crossing a divide. "You have to be imaginative, to see possible solutions" (girl, 12, NYC).



©World of Goo, by 2D Boy

Examples from RITEC research

Roblox

In Bloxburg (Roblox) the player's decision-making, and the sensory output that supports it, are done within the context of **roleplay**. This makes it possible for children to pursue diverse interests, such as exploring recipes and gaining cooking knowledge that can be applied in the non-digital realm, as well as gaining a useful cooking 'skill' in the game.

© Bloxburg, by Roblox

LEGO Tower

In LEGO Tower, excitement emerged when players were able to **customise** their own LEGO minifigures and towers. "I liked the LEGO Tower because you got to build your own apartment building. I liked how there was a bunch of things to pick from. You could build a cafe or something." (boy, 10, NYC).

© LEGO tower, by The LEGO group

Examples from RITEC research

Hotel Role-play

On a hotel **role-play** game app: "It's like you get to, it's like you are the mom of them. [...] And it's like a hotel. But you do all the work at the hotel" (girl, 6, South Africa).

Games like Hot Springs Story 2 allow children to create hotels and resorts to meet the needs of imagined guests.

© Hot Spring Story 2, by Kairosoft

More examples of roleplay's contribution to children's wellbeing through Agency, Creativity:

"Before telling us the character setting of the character, let the participant guess what I would do if I were in this character, and decide the direction through discussion."

(Small group, 12-15, Taiwan).

On tabletop RPG games:

"[It allows you to] invent a story on the sport; does not have a preset course that has to be followed; you can choose the character, story, etc."

(Small group, 12-15, Brazil).

Sensory Mechanics

Feature Focus:

Optimal sensory experience

Optimise the sensory features (visual / audio / haptics) used to enhance the ambience and tone of the play experience, for your specific audience.

Do's

- Consider using sensory experiences (input & output) to **enhance** feedback and add an emotional layer to the interaction design.
- Consider adding features like **pleasurable** tactile, visual or auditory experiences or opportunities to explore digital artifacts through haptic interfaces, to support pleasurable sensory experiences of play beyond feedback, for your specific audience, taking into consideration age/context/motivations (see play drivers).
- Depending on their design, these sensory outputs could promote **opposite** emotions and moods: joy and stress, calm and excitement, light humour and intensity. The achieved effect may vary by age/context/motivations. Make sure your design achieves the intended outcome.
- Ensure that the sensory aspects of games are designed so that a diverse range of children can play comfortably, for example by giving children **control** over the sounds they encounter in a game.
- Consider providing options to modify the **intensity** of sound and haptics for players with different needs.

Don'ts

- Don't **overwhelm** players with visual, auditory or haptic output, especially in combination of multiple sensory modalities.
- Don't use visual, auditory or haptic output to **compel** children to keep playing when they want to take a break or stop.
- Don't use these outputs to create **prolonged** strong negative emotional experiences.

Related to play experiences:

Competence **Emotions** **DEI**

Examples from RITEC research

Some children, especially neurodiverse children, noted how certain game designs made digital play a safe space from a sensory perspective. Unlike some physical social spaces, children could **control** how loud or quiet sounds were. Minecraft was mentioned as a good example. There are various options for controlling different types of sound in Minecraft.

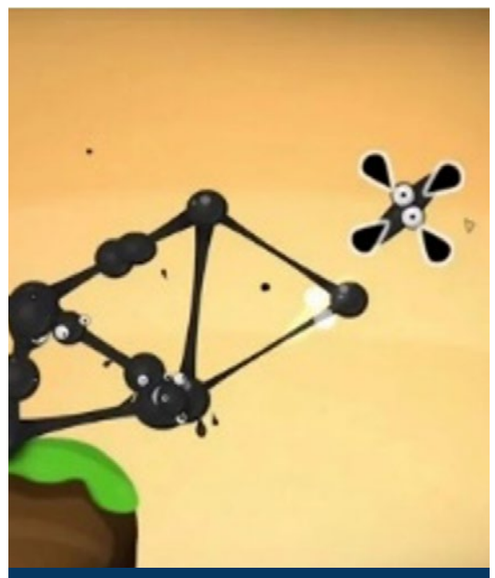
'She has huge, huge environmental challenges (in physical social spaces. SG). Noise, sound, not particularly smell so much, but noise, sounds and yeah just… it's huge for her.' (parent of 9-year-old girl, UK).

© Minecraft, by Mojang

Children described a range of positive sensory experiences associated with how games were designed visually and/or sonically.

The 'goo balls' in World of Goo make a diverse range of sounds that children found inherently pleasurable, **entertaining** and sometimes very endearing.

"I like the sounds in it, I like the sounds the blob-blobs make." (girl, 9, UK).



© World of Goo, by 2D Boy

LEGO Builder's Journey features a very relaxing **soundtrack**. Many players emphasised the positive feelings of relaxation afforded.

Children (e.g., boy, 10, South Africa; girl, 10, South Africa; boy, 8, UK; and girl, 9, Australia) said the sound in LEGO Builder's Journey made them feel calm. "Calms you, yes" (boy, 10, South Africa).

© LEGO Builder's Journey, by The LEGO group

Sensory Mechanics

Feature Focus:

Features that are pleasing

Sensory features that do not necessarily benefit the game's objective but add joy and delight to the player's experiences.

Do's

- Create game mechanics that are pleasurable to undertake and facilitate creativity, build feelings of enjoyment (i.e., activities that are enjoyable to undertake regardless of outcome or incentive).
- Consider sensory design features that can help children relax and relieve stress.
- Consider mechanics and aesthetics supportive of children achieving 'flow' states, such as continuous gameplay, tasks demanding concentration and the absence of distractions.

Don'ts

- Don't **add too many** mechanics that may take away from the main experience you are designing.
- Make sure the humour and/or visuals/sounds have the **intended effect** in the age group you are designing for.
- Don't attempt to address **too many** well-being dimensions in the same game. For example, getting a sense of competence may be incompatible with relieving stress.

Related to play experiences:

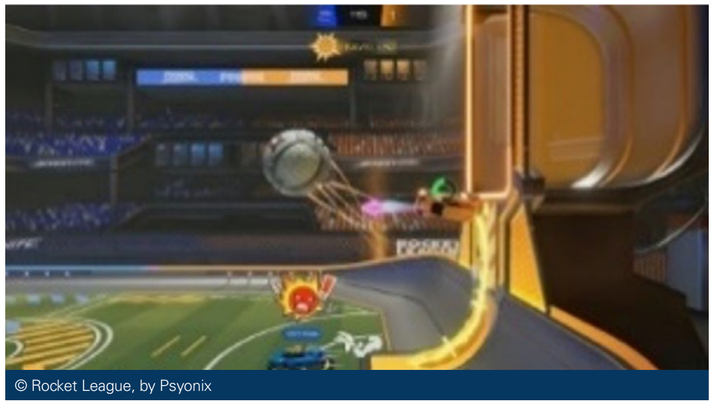
Emotions **Creativity**

Examples from RITEC research

© Rocket League, by Psyonix

In Rocket League **excitement** and joy were seen in response to obtaining and using the boost (i.e., the ability to accelerate faster than standard speed), manoeuvring the car to jump and flip in the air, and driving up the wall surrounding the arena. These additions are not part of the main gameplay, but their sensory features proved joyful in themselves.

Players also enjoyed using emoticons or predefined speech bubbles to visually **express** themselves after a goal or loss.



© Rocket League, by Psyonix

World of Good enhances feedback with auditory **humour**: "I like the funny goo noises" (boy, 12, NYC)

©World of Goo, by 2D Boy

Examples from RITEC research

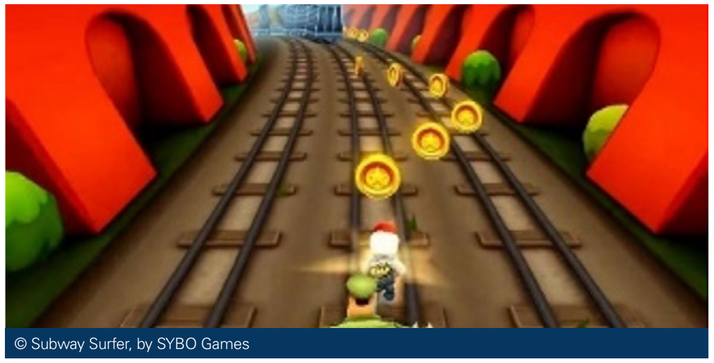
A child who was experiencing bullying at school experienced satisfaction and **stress relief** by coming home to play Goat Simulator: "It makes me feel happy inside" (girl, 10, Australia).

Goat Simulator provides transgressive narrative, humour and sensory experiences (sound effects, visuals). Many children described experiences of pleasurable well-being and stress relief associated with these features in games like Goat Simulator.

© Goat Simulator, by Coffee Stain Studios

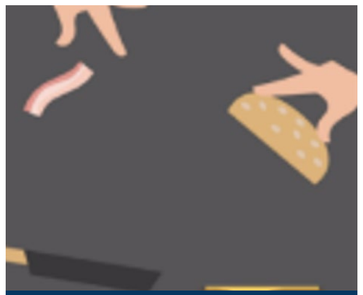
Children (e.g., boy, 11, South Africa; boy, 12, UK; boy, 8, UK; boy, 12, UK) noticed how certain games, such as Subway Surfers, Brawhalla and Minecraft, helped them to concentrate and achieve a sense of **'flow'**. Being in this state of flow was experienced as feeling 'good' and 'happy'.

Subway Surfer provides continuous gameplay, something some children identified as supportive of a sense of 'flow', sometimes understood as a productive sense of immersion, enjoyment and energised focus.



© Subway Surfer, by SYBO Games

On 'Bacon: The game': "The sound of frying bacon is very healing, the game scene is very interesting, and there is **vibration** for real!" (small group, aged 7–11, Taiwan).



© Bacon: the game, by Philipp Stollenmayer

Sensory Mechanics

Feature Focus:

Physical & Sensory variety

Factors affecting how players control and experience sounds and visuals in the game.

Do's

- Age, context, physical challenges, neurodiversity and culture are some of the factors that may affect the way your players interpret differently sensory features in the play experience. Make sure your game is designed so that a B range of children can play.
- Consider whether app-based games can be played successfully on a range of **devices**, including older mobile devices and offline situations.
- Go beyond visual and audio: Consider how features like motion sensing, gesture recognition, accelerometers and optical sensor technology could support children's **physical** play.
- Consider providing options to engage with the same information via different **modes** to cater for children with different needs. Offer audio/visual/tactile alternatives or in addition to each other.

Don'ts

- Don't make critical sensory features' choices without understanding your audience's needs, abilities and delights.

Related to play experiences:

DEI | Competence | Creativity

Examples from RITEC research

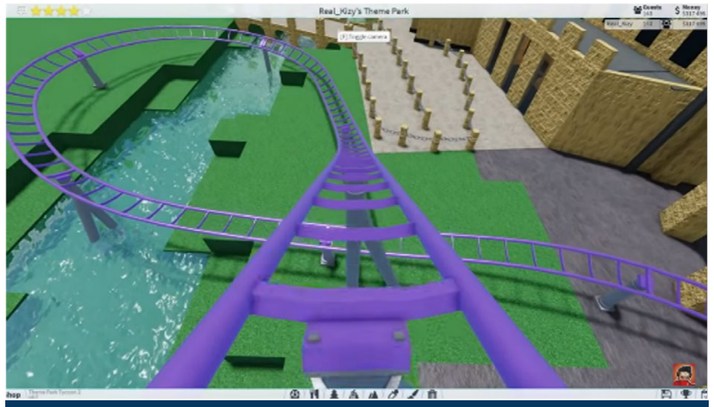
Wii Sports Resort offers many different options for switching easily between different games in an overall package. This was particularly important for some children, who found the opportunity to switch between games supported continued attention.

Elly (girl, 8, Australia), who had been diagnosed with ADHD, found she needed lots of different games within a package like Wii Sports Resort in order to promote feelings of concentration and, as such, relaxation.

© Wii Sport Resort, by Nintendo

Theme Park Tycoon 2 allows players to virtually 'ride' the rollercoasters they have built, supporting sensory experiences through sound and visual effects.

Some children (e.g., girl, 11, UK) enjoyed simulation games that offered experiences that felt close to 'real life', including Theme Park Tycoon – she liked the feeling of riding on the rollercoasters she created, noting that it would be better in Virtual Reality, so she could **'feel' the rides**. Similarly, some children (e,g., girl, 7, UK) enjoyed the physical sensation of experiencing water slides in the game Water Park.



© Idle Theme park Tycoon 2, by Codigames

Examples from RITEC research

© SpongeBob's Truth or Square, by Heavy iron Studios

SpongeBob's Truth or Square allows children to engage in fast-paced, **thrilling** and humorous actions, such as turning SpongeBob into a Sledgehammer Smash to whack intruders or even an Explosive Cannon to aim and blast baddies, which brought great joy to children (e.g., boy, 8, Australia) who enjoy fast-paced, thrilling action games.

Narrative

Feature Focus:

Choose your own adventure

Opportunities to influence narratives through player decision-making.

Do's

- Consider designing an **open-ended** environment that allows for different narrative developments based on the player's decisions.
- Consider giving children opportunities to influence narratives through **creative choices** and mechanics (for example: puzzles, character building, mini challenges, sandbox).
- Allow for **replay** of situations and narrative to 'try out' different outcomes.

Don'ts

- Don't add too many alternatives/options to avoid the **paradox of choice** (being overwhelmed with so many choices that you prefer not to choose at all).
- Don't **limit** players' choices unnecessarily
- Don't be reluctant to commit to **linear narratives** where this is appropriate to the style of game

Related to play experiences:

Creativity | Autonomy | Identities

Examples from RITEC research

© Zelda (Tears of Kingdom, Breath of the Wild), by Nintendo

Players can pursue a range of very different 'stories' in Zelda: Tears of the Kingdom. Depending on their **choices**, new abilities such as 'Ultrahand' are unlocked, which then create even more choices for gameplay possible. 'You need to create things and try to figure out a way around things [...] I guess that game was designed so that everyone plays differently? And they have their own way of doing things? [...] They make it so that you can, like, create anything using this ultra hand tool – at all. And there are, like, different ways you can think of things [...] So it's like there's no one way to do things. Also, when you go to the mat you get you could go anywhere really and like you could go to four places or you could explore you could go to the chasms below and stuff I mean, you could like get weapons, but each way kind of links to a story makes the experience really fun. And you can solve problems and defeat bosses if you do it in that way.' (boy, 12, Australia)

© Finding Ojipockle, by Apurisukabushikigaisha

On 'Finding Ojipockle': "[The games are] healing and open world, the character looks pretty and it's voice is nice." (small group, aged 7–11, Taiwan).

Narrative

Feature Focus:

Caring for others

Narratives supportive of empathy and care/nurture. Empathy development supports relationship creation and broadens children's encounters with different backgrounds and contexts. Creating game design features of nurturing and care taps into role-play play patterns, which are part of child development.

Do's

- Consider including narratives that encourage children to see things from another's **perspective** (or a variety of perspectives) and promote empathy and social emotional learning.
- Consider including narratives that encourage children to act in the interests of **others** (e.g., through caring or nurturing).
- Consider including content and play styles that are engaging for children and other family members across a diverse age range, to support children's caring motivations. Many children were motivated in their digital play by a desire to cater to the needs of family members (e.g., younger children or grandparents), but struggled to find games that were genuinely accessible, appropriate or enjoyable in **intergenerational** play.

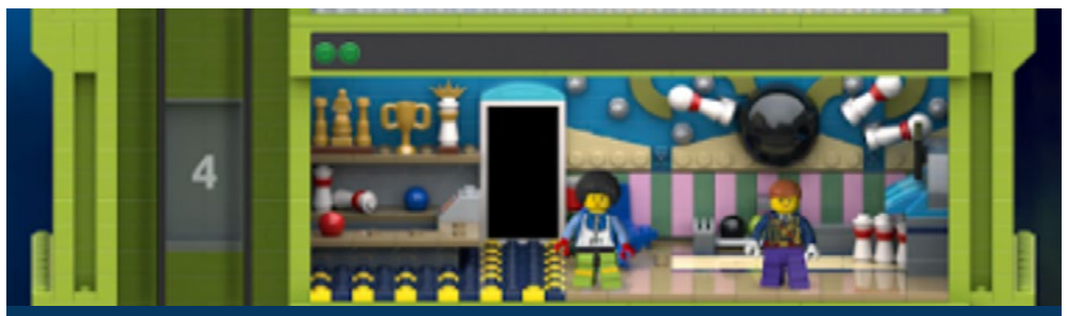
Don'ts

Related to play experiences:

Relationships | Emotions | DEI

Examples from RITEC research

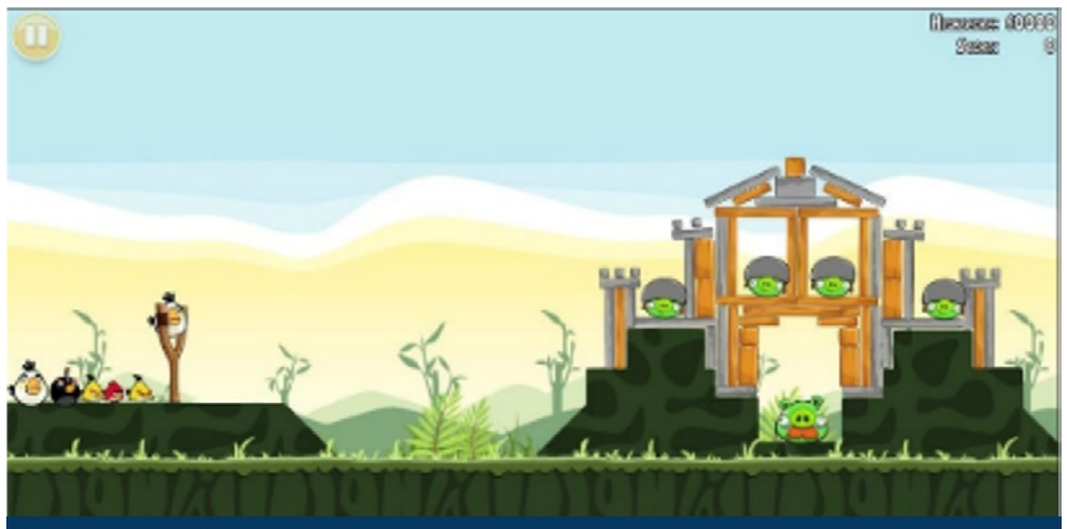
"I was wondering how the people were **feeling**" (boy, 9, LEGO Tower player, NYC)



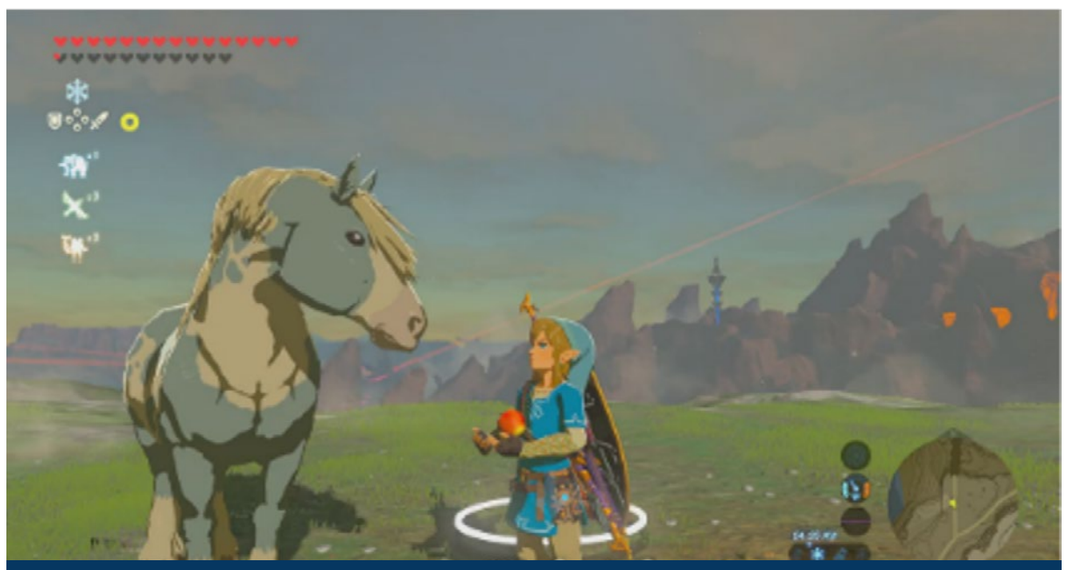
© LEGO tower, by The LEGO group

Examples from RITEC research

"I wish I could just **do more** and see the other places where the pigs live" (boy, 10, AngryBirds player, NYC)



© AngryBirds, by Rovio



© Zelda (Tears of Kingdom, Breath of the Wild), by Nintendo

Players can **nurture** horses in Zelda: Breath of the Wild, including feeding them, taming them, choosing their saddles and bridles and soothing them. Children talked about positive feelings associated with caring for imagined animals, such as a 10-year-old girl in the UK who particularly enjoyed the inclusion of horses in Legend of Zelda: Breath of the Wild. This aspect of the game's narrative supported caring and nurturing practices within the game: "One thing that I like about this game. I like the graphics of the game, the horses – I think they're just really sweet" and "My God they're greedy as well. Like every time I take them to a village and there's a carrot patch, like I don't even tell them to go there but when I leave them there they go straight into the carrot patch and eat the carrots".

Narrative

Feature Focus:

The power of smiling

Narratives supportive of positive emotions and humour.

Do's

- Consider including narratives that offer opportunities to experience positive affective moods and emotions (such as joy and excitement).
- Consider including narratives that present age/culture-relevant humour.

Don'ts

- Don't inadvertently create opportunities for inappropriate content, non-inclusive language or humour that occurs at the expense of others

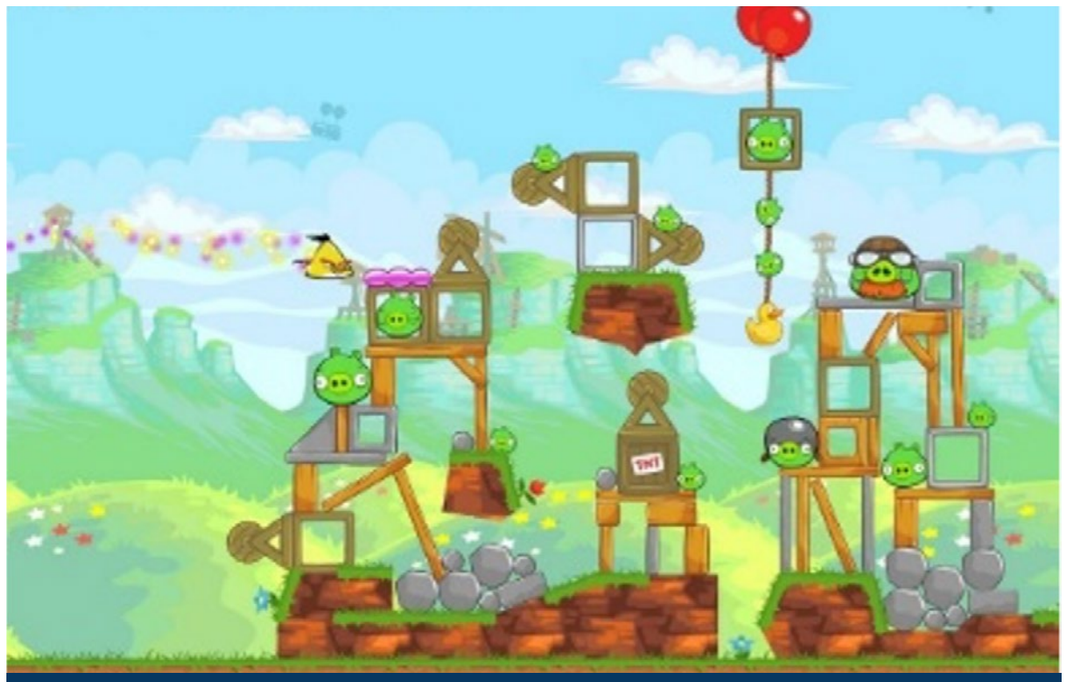
Related to play experiences:

Emotions

Examples from RITEC research

In Angry Birds, the pigs are about to be attacked by the birds. There is an introductory narrative that provides humorous reasoning to the simple casual-game mechanic and creates motivation for the players.

"Why are the birds angry at the pigs?" (Angry Birds player, NYC)



© AngryBirds, by Rovio

Examples from RITEC research

Children found lots of narrative elements funny. For example, World of Goo offers kooky, funny and unexpected narrative elements. A 6-year-old boy in Australia found the plot of World of Goo funny, reading parts of the on-screen 'story' aloud and laughing.

© World of Goo, by 2D Boy

Games like Stumble Guys offer simple narrative constructs that are nonetheless extremely funny to many children (such as the premise that you are a bouncy character, and your mission is to push other bouncy characters off increasingly surreal platforms and environments).

This game made children laugh out loud (e.g., boy, 7, Cyprus).

© Stumble Guys, by Scopely, Kitka Games

Narrative

Feature Focus:

Gloomy can be good

Narratives supportive of exploring dark or difficult emotions.

Do's

- Offer opportunities for children to explore dark or difficult emotions in a **safe space**.
- Consult with **experts** in children's digital play and well-being on ways of introducing difficult emotions for your specific age-group and culture.
- Be thoughtful in applying their suggestions to encourage children to experience and learn to **regulate** difficult emotions.

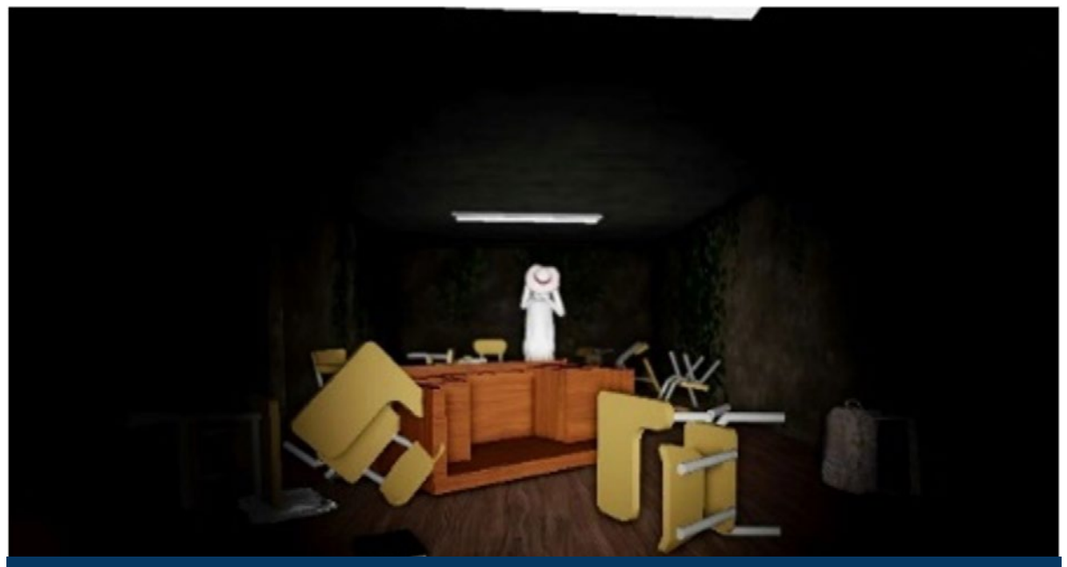
Don'ts

- Don't be **afraid** to explore narratives inclusive of dark and difficult emotions.
- Don't **bombard** children with negative content, nor present them with age-inappropriate negativity.
- Don't expose players to overly negative narratives without warning or **preparation**.

Related to play experiences:

Emotions

Examples from RITEC research



© The Mimic (Roblox), by CTS Studio

On scary games including The Mimic: "Because, like, I want to like not be scared of it so I try and play it more to get used to it". (girl, 9, UK).

Through spooky graphics, sound effects and narrative structure, games like The Mimic provide controlled opportunities for children to explore fear and terror. Children's play has always been an important context for children to seek out, confront and explore dark and difficult emotions and experiences, something which can help prepare them for challenges beyond play.

© Piggy (Roblox), by Minitoon

On Piggy (Roblox): "I was literally shaking; I could barely stand up because I completed the house all by my own. And the piggy kept chasing me and I had like 16 seconds left to get to his door." (girl, 9, UK).

Through spooky graphics, sound effects and narrative structure, games like Piggy (Roblox) provide controlled opportunities for children to explore fear and dread.

Incentive system

Feature Focus:

Success feedback

Clear, encouraging and affirming feedback when players succeed reinforces their actions, improves motivation, and confirms perceived competence.

Do's

- Provide the player with **clear** feedback when they do well.
- When designing for collaborative play, consider how you can facilitate **shared** feelings of competence, and successful feedback for working together.
- Create gameplay opportunities for **shared** success.
- Celebrate moments of achievement with **rewards**, based on the players' type of motivation for growth and success.

Don'ts

- Do not provide positive feedback where it might appear **insincere** or inappropriate. Aim to be generous without risking loss of credibility.
- Don't shy away from providing **negative feedback** when players aren't successful but be mindful of its impact on your well-being goal for the game and consider ways to make it effective without being offensive or demotivating.
- Don't forget that success might mean **different things** to different children. Consider the play drivers as a starting point for building recognition and celebration of achievement in games.

Related to play experiences:

Competence **Relationships**

Examples from RITEC research

© Rocket League, by Psyonix

Scoring a goal in a Rocket League, a sports game, provided moments of **excitement** and enjoyment.

The experience of joy and excitement extended into the moments when the replay was being watched.

"awww...no way...yesss....goaalll." (girl, 11, Australia).

© Rocket League, by Psyonix

Players felt a sense of **social connection** when they worked together to score a goal. He tells his partner he did a "good job!" in a friendly and encouraging tone (boy, 9, Australia).

"With my friend Diego, me and Diego, Diego **helped** me get a streak of 20 and then I never beat that streak ever" (boy, 11, NYC).

"When you progress [to] a new level [and] feel **proud** and satisfied." (small group, aged 7–11, Iraq).

Incentive system

Feature Focus:

Collectables

Opportunities for players to collect items and objects and curate their resulting collections are a common play pattern in non-digital play environments, which create incentives for ongoing progress.

Do's

- You can create opportunities for children to collect, for example, new items, badges or avatars in **different** ways. Find the most interesting and joyful mechanic for your audience. For example: unlocking, discovery, creation, easter eggs or challenges.
- Create opportunities for children to curate and enhance their collection in an **ongoing** manner. For example, selecting which item they would like to get, presenting their collections, swapping items ('trading'), or adding their own personal touch.

Don'ts

- Don't let your well-being goals for a game depend on the **centrality** of collectibles – in some contexts, you may want to avoid having collectables distract from the main focus of game play, although it's worth bearing in mind that some children play games to collect, even when the designer's intended primary goal is something else.

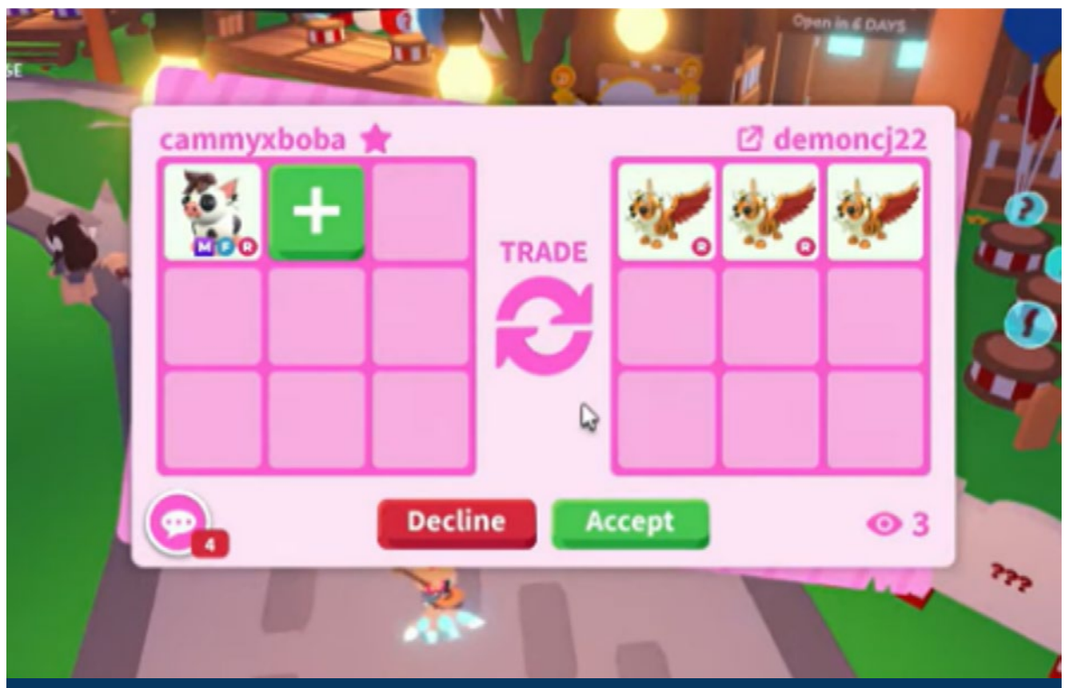
Related to play experiences:

Competence | Autonomy | Emotions | Creativity

Examples from RITEC research

Collecting, trading and curating in-game objects supported learning, and was a serious pursuit and supportive of significant well-being outcomes for many children. For example, one child (girl, 10, UK) played Adopt Me! (Roblox) with a strong focus on collecting and **curating** pets in the game, describing herself as a "pushy collector" and describing pride in her collection, which was the result of "years of working".

One group in Indonesia commented that games that integrate a reward system (e.g., upgrades to equipment) could promote well-being. They stated that "because if you win, you get a prize that makes your heart happy. [It] teaches us that there is an **award** in everything we do." (small group, aged 7–11, Indonesia).



© Adopt me! (Roblox), by Uplift Games

Incentive system

Feature Focus:

Creation and Customization

Creating your own part in the game is a powerful incentive for many children. This includes building, designing, programming, new objects and environments, and customizing current elements in the game as part of the gameplay.

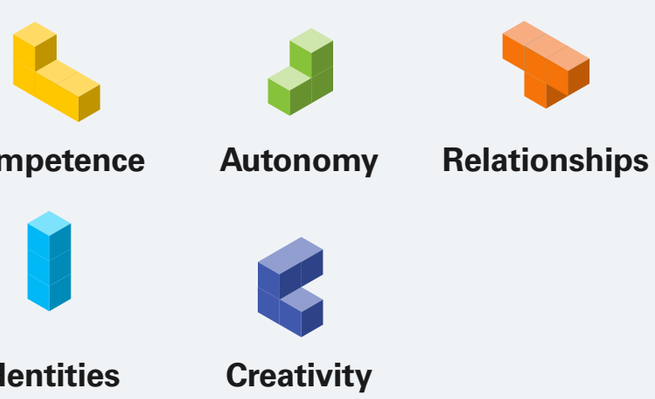
Do's

- Consider supporting players' incentive to create, customise and sometimes share, including authoring diverse **multimodal** content (e.g., written texts such as guides for other users, musical compositions, homes, landscapes and clothing)
- Ensure the interaction design for the player's customization **process** supports the child's sense of agency and creativity.

Don'ts

- In some contexts, avoid having the customization features **distract** from the main focus of game play, although it's worth bearing in mind that some children play games to customise and create, even when the designer's intended primary goal is something else.

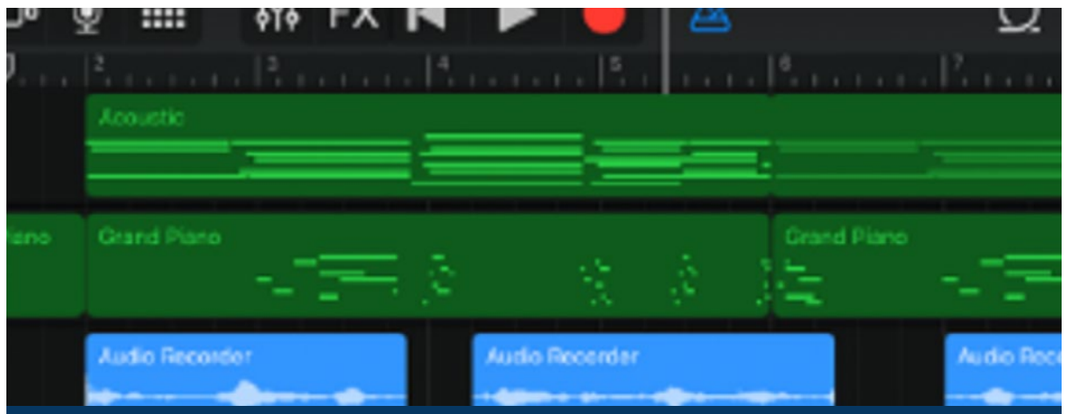
Related to play experiences:



Examples from RITEC research

Children can easily create their own musical **compositions** in GarageBand (e.g., GarageBand for iPhone).

"Uh… it's like I was experimenting [...] when I'm bored [...] or when I'm tired [...] I listen to… I make my own music' (boy, 11, South Africa).



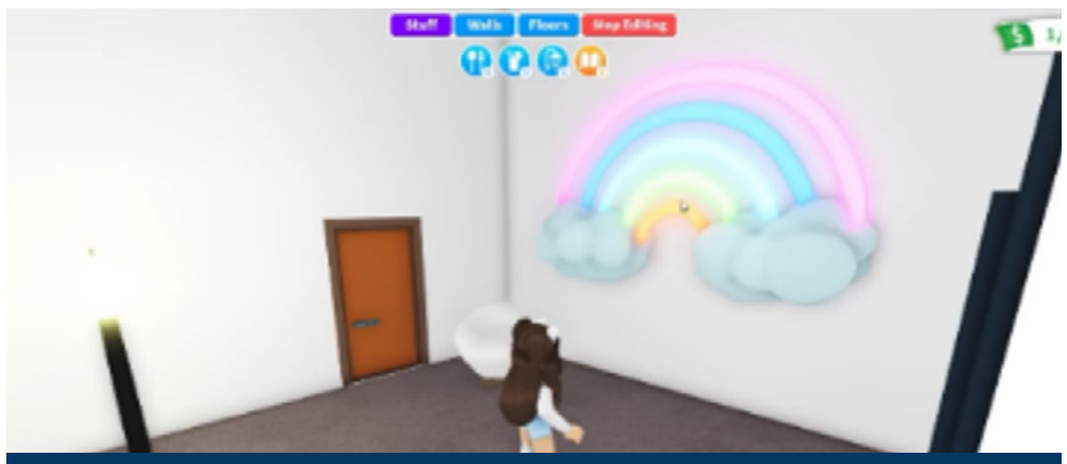
© Garageband, by Apple

Children can easily create their own **visual texts** in Spray Paint! (Roblox). "So if I just come over here, I can go over here and I can type if I go black, completely black. I can do higher. If I wanted it bigger, I would make it bigger… And if I don't want to do high anymore, I would do… I would erase it. And if I wanted to do, like, a pink, like a yellow… basically, you can just do anything you want." (girl, 9, UK).

© Adopt me! (Roblox), by Uplift Games

Player of Adopt Me! (Roblox) have almost endless options to **customise** their homes and imagined lives.

"I like Adopt Me! because you can change your house, and you can have new wallpaper. When you get a pet, when you adopt a pet, you look after it." (girl, 10, UK).



© Adopt me! (Roblox), by Uplift Games

Incentive system

Feature Focus:

Anticipation

Feelings of anticipation can positively heighten the feelings that follow.

Do's

- Signal to players ahead of time when they can **expect** rewards and other game elements.
- Create play mechanics, narratives and forms of **progress** that allow the player to enjoy feelings of anticipation, either gradual or by surprise.
- **Reinforce** anticipation to create excitement.

Don'ts

- Don't use anticipation **excessively** to get players to continue playing when they want to take a break or stop.
- Don't oversell and create **false** anticipation. After creating anticipation make sure to deliver the appropriate gameplay experiences to reinforce achievement and perceived competence.

Related to play experiences:

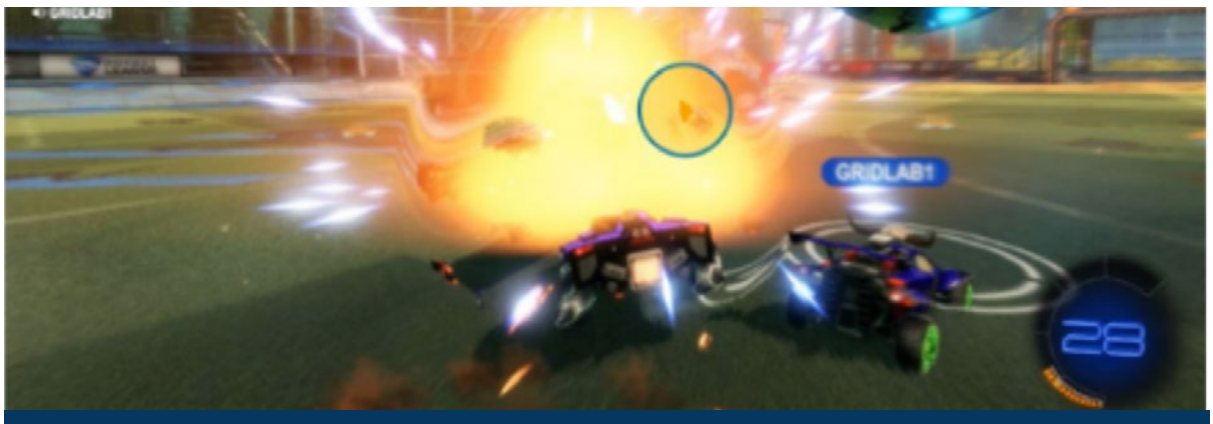
Emotions

Examples from RITEC research

Anticipating the start of a match in Rocket League Sideswipe provided moments of **excitement** and enjoyment.

Approaching the end of a match generated moments of excitement but also fear (this is not necessarily a negative experience).

"I mostly like games that give you a feeling of **wondering** to see what happens next" (girl, 9, NYC)



© Rocket League, by Psyonix

Incentive system

Feature Focus:

Challenge

Adding challenges creates a strong incentive for challenge-seeking players. Feeling challenged is an important precursor for the satisfaction that comes with completing a task.

Do's

- Players exhibited higher levels of arousal and more **intense emotions** in highly challenging sections of gameplay. Add challenges for supporting your players' competence and perceived competence.
- Be aware that during challenging parts of the game, the player will experience emotions more intensely. It may be important to provide moments of relative **relaxation** around such moments.
- Consider different kinds of challenges for different play drivers and personal preferences. For example: short form (i.e., mini games) and long form (i.e., ongoing with different chapters), various content areas, casual games mechanics and open-ended creative solutions, time/score (quantity) driven versus quality driven.
- Adress **support** features, such as 'cheats', 'hints' and the ability to skip levels in games. For some children these were vital for supporting feelings of competence, allowing a differentiated level of challenge. For others, these felt like 'cheating' and were associated with negative feelings and a reduced sense of competence.

Don'ts

- Don't design for extremes. Games that are too easy or **too challenging** may not be best for well-being. Competence was most seen when players had to persevere.

Related to play experiences:

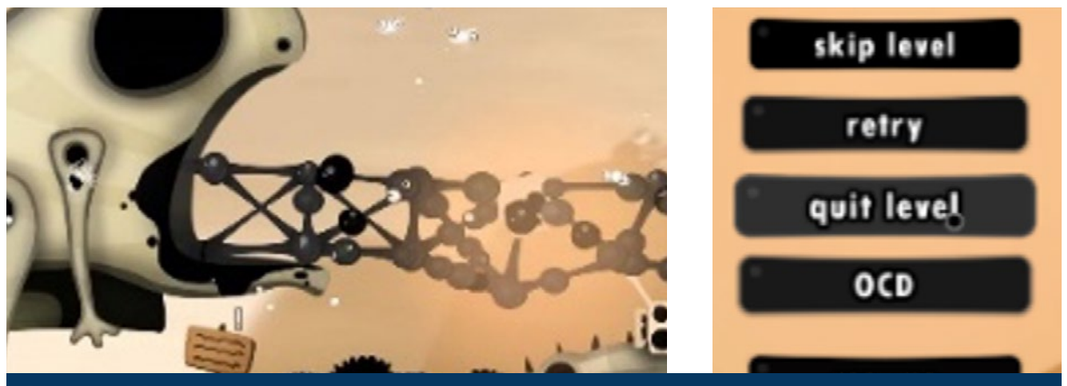
Competence **Emotions**

Examples from RITEC research

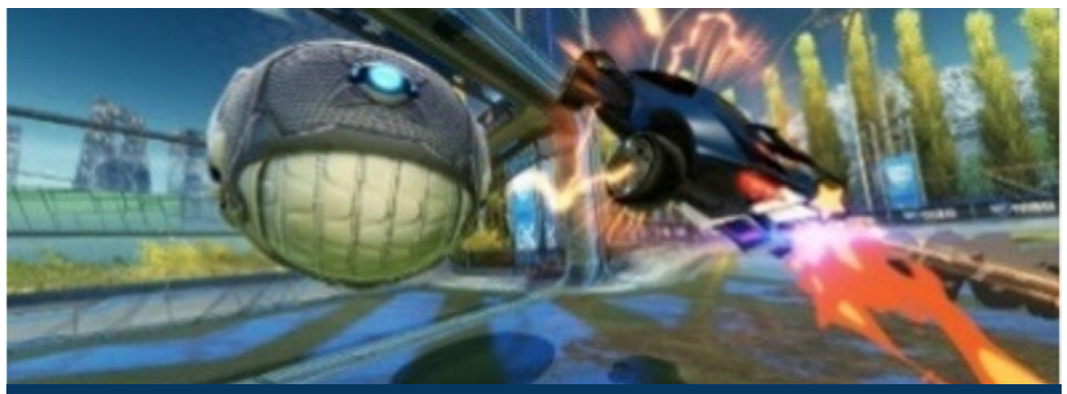
In World of Goo, greater joy and pride were seen when **persisting** through challenging levels. "When I passed a level in World of Goo that I had been working really hard on and then I passed it, I felt happy." (boy, 12, NYC)

"The harder it is, the more **captivating** it will be, it's a mind game." (girl, 11, NYC)

In World of Goo, children can skip levels they're finding too difficult. For some children (e.g., boy, 11, South Africa; boy, 7, UK; boy, 9, South Africa) being able to skip levels in World of Goo supported a sense of **competence**. For others (e.g., boy, 12, UK) this felt like failure: "it just shows defeat".



© World of Goo, by 2D Boy



© Rocket League, by Psyonix

Rocket League: Image shows opposing team scoring a goal. "I mean, I guess I just lost a goal to the enemy team pretty early on in the match, which is like generally... it's like generally not the best because it's like they already have a lead over you. As to why... I guess I probably felt joy, because we had like met pretty minimal resistance from the AI up until this point. It's like, oh, joy and like realizing the AI is... can be... is like able to provide some sort of **challenge** sometimes." (boy, 13, Australia)

© Ludo King, by Gametion

On Ludo King: "I like it and would come back to this game; Because [it is] very fun; I like the game with levels because [it] is a **challenge** with points, and you can play with many people, and they choose the colors." (Small group, 7-11, Albania).

Incentive system

Feature Focus:

Aspiration

Being able to see what success looks like can be key to players identifying possible pathways and approaches. Aspiration creates anticipation and motivation, and strengthens the joy, satisfaction, and sense of competence after success.

Do's

- Provide players opportunities to see **examples** of high-level play. This will allow them to both identify strategies and techniques to achieve their goal, as well as aspire to them.
- Adding a leaderboard may create an incentive for competitive players, as they aspired to climb up the ladder of best **scores**.

Don'ts

- Don't inadvertently make children feel as though their own performance is **inadequate** in comparison to that of other players.

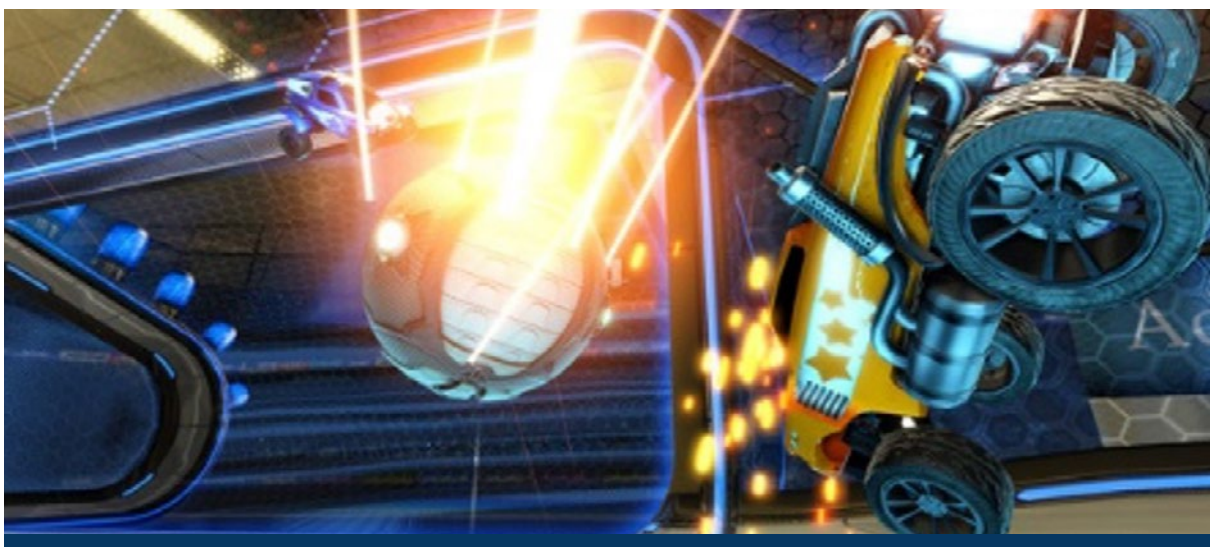
Related to play experiences:

Competence **Emotions**

Examples from RITEC research

"Because like all the very good Rocket League players, they do that kind of stuff too. And I felt like kind of like low to them. So when I pulled something off like that, I felt like I'm **at their level.**" (boy, 11, Australia)

Showing a player scoring a goal by jumping (a more advanced move) in order to inspire competence.



© Rocket League, by Psyonix

Progression Design

Feature Focus:

Onboarding

Helping the player build their confidence in a new setting will start their game progression on a positive note.

Do's

- Provide achievable and relatively easy, clear and succinct **tutorials** to on-board players into the game. These provide joy and feelings of competence as well as an opportunity to discover new things about the game.
- Assume that many players will not watch/participate in the tutorial. Create unique first-time use experience where onboarding happens **gradually** in the gameplay. For example: using tool tips, animations or an onboarding frame.
- Consider creating a short narrative-related clip with onboarding tips.
- Create an **FAQ** resource players can go to later, at any time, to receive onboarding information such as feature descriptions, progression and saving the game.

Don'ts

- Don't **force** players to complete overly long tutorials without the option to skip to main gameplay if they prefer.
- Don't leave your players in situations where they **cannot learn** how to play the game on their own within their current state. This creates mistrust and may cause abandonment.

Related to play experiences:

Competence **Emotions**

Examples from RITEC research

"**I don't know** what I'm meant to do here." (boy, 11, Australia). LEGO Builders Journey shows the moment a player was unsure what to do.

© LEGO Builder's Journey, by The LEGO group

Progression Design

Feature Focus:

Challenges development

Design challenges that gradually develop and increase in difficulty or add scaffolding/help for harder challenges.

Do's

- Provide **gradually** increasing challenges and aim to build on existing knowledge to maximise the player's feelings of competence.
- Consider offering **strategic** and logic puzzle challenges.
- Consider offering children opportunities to **set their own** challenges through more open-ended formats.
- Consider offering challenges that support children to develop **skills and knowledge.**
- Create **scaffolding** mechanisms that support challenge success (like help or tips) and are then gradually removed.

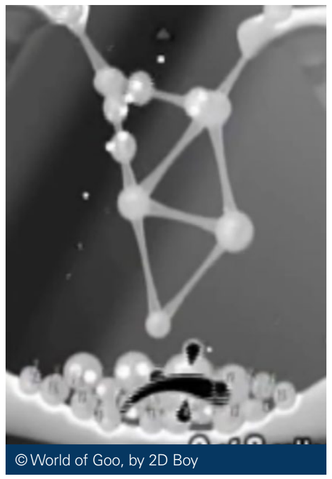
Don'ts

- Don't provide challenges that outstrip a player's likely ability without hints or tips if they may struggle.

Related to play experiences:

Competence **Emotions**

Examples from RITEC research



© World of Goo, by 2D Boy

World of Goo provides challenges that can be frustrating, but many children found these ultimately very satisfying : '**Frustrating**' but being confronted with a certain level of challenge is positive: "It was good. Challenging. And sometimes… do you know a word to say like, uh, more you in a way, uh, you feel like you must.. Do something [...] like determined." (boy, 9, South Africa).

Examples from RITEC research

© LEGO Builder's Journey, by The LEGO group

LEGO Builders Journey – the moment the player was stuck.

"I guess I felt that way because I literally had no idea what to do. And it was just at that point where I really wanted to give up and like, play something else. Because the couple of... I'm pretty sure the levels before this one, I had already started to like, get to that phase where it started to get really boring for me. And I was just sick and tired of it and I didn't want to do it anymore. And just got to that phase where like I'm like, I'm done. And then it probably made me feel really negative." (girl, 12, Australia)

LEGO Builder's Journey offers challenges that grow more difficult as the game progresses. Players showed joy and feelings of competence when their learning was well scaffolded. "I think it was pitched at the right level in terms of allowing him to be successful at it. And I guess if the child had tried to play it and found it too hard then would that have made them feel disappointed or kind of, you know the opposite of happy and kind of pleased with themselves [...] and I get the sense that it still felt like a challenge, so it wasn't so easy that he just kind of breesed through it all but he took some **sense of achievement** from completing it. So I think that was good." (boy, 12, UK).

© LEGO Builder's Journey, by The LEGO group

Examples from RITEC research

Placing sunflowers in Plants v. Zombies:

"I **figured out** the functions and see what works, like putting the sunflowers at the back." (boy, 12, NYC)

© Plants Vs. Zombies, by PopCap games

On Minecraft Creative Mode: "Well Minecraft, you can make it as **hard or as easy as you want**. I think I like Minecraft better." (girl, 9, UK)

Minecraft's different modes of play make it easy for children to either follow pre-set challenges or set their own challenges, following their diverse interests.

"Feelings of excitement and competition teach planning, being in control and **overcoming** challenges, even in non-digital games." (small group, aged 12–15, Jordan).

© Minecraft, by Mojang

Progression Design

Feature Focus:

Levelled Play

Children experienced feelings of competence as they noticed they were progressing through levels.

Do's

- Provide players with a clear **indication** of when they complete each level, and an overall sense of their progression through the game (e.g., 10/12 levels completed in this world).
- Consider additional progression currencies to provide a sense of progression in case a player is 'stuck' on a level (i.e., experience points).

Don'ts

- Avoid designing progression within levels and across levels that are **confusing** to players.

Related to play experiences:

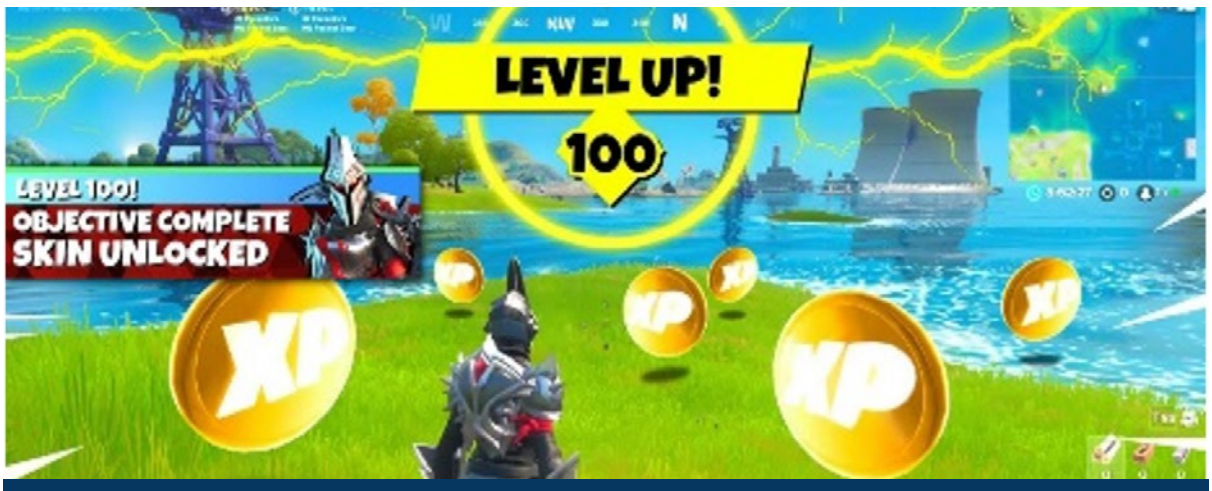
Competence

Examples from RITEC research

Fortnite introduces many levels as well as additional progression currencies.

"Very entertaining. Can be played with friends or new people. Has **many levels**, suspense, and many characters." (small group, aged 12–15, Jordan).

"[Our game allows you to] build many levels. In that way it's more **interesting**, various options, not just one level, not to be boring." (small group, aged 7–11, Bulgaria).



Progression Design

Feature Focus:

Uncertainty

Uncertainty creates a unique state in the player which is likely to capture their interest.

Do's

- Leverage moments of uncertainty to create opportunities for **emotional** experiences, autonomy, creativity and competence.
- Use moments of uncertainty to later increase the opportunity for desired well-being **outcomes** (emotional experiences, autonomy, creativity and competence). For example, uncertainty of success will increase feelings of competence when completing a task, uncertainty regarding how to approach a problem will facilitate creativity, uncertainty regarding the likely path a narrative will take provides room to build excitement, joy or sorrow.

Don'ts

- Don't **overuse** uncertainty to the point where the player is confused about their goals or the best approach in each situation.

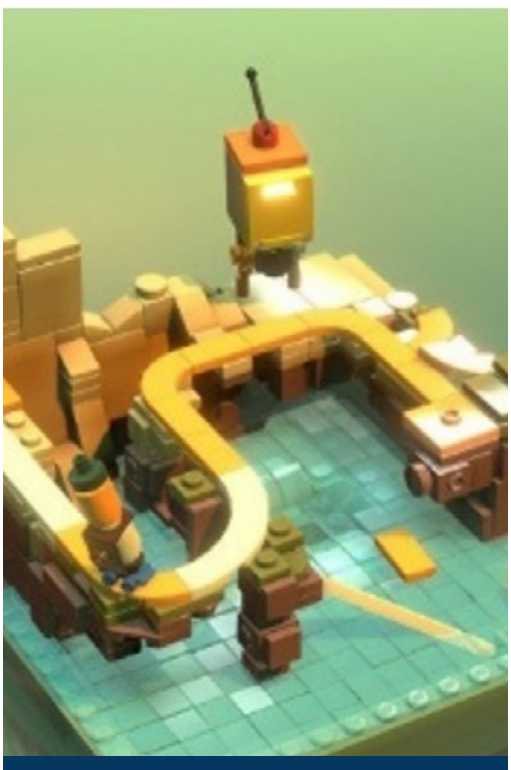
Related to play experiences:

Competence **Autonomy** **Creativity** **Emotions**

Examples from RITEC research

In LEGO Builders Journey, the player was completing his first open-ended challenge and was uncertain of his next steps. When making this statement he could choose which way to solve the problem.

"It was cool, because it wasn't just like solving a task anymore. It was like you could like **get to choose** ... like there are like different ways to choose how to do it. So like there's exploration in to how you can solve it instead of just doing it one way." (boy, 13, Australia)



© LEGO Builder's Journey, by The LEGO group

Progression Design

Feature Focus:

Pathways

Provide multiple paths to success.

Do's

- Providing the player with various **options** of how they progress and succeed depending on their choice. This is likely to facilitate feelings of autonomy, creativity and competence.
- The more options or pathways are available, the more **guidance** players may need regarding the impact of these choices and the ability to choose again.

Don'ts

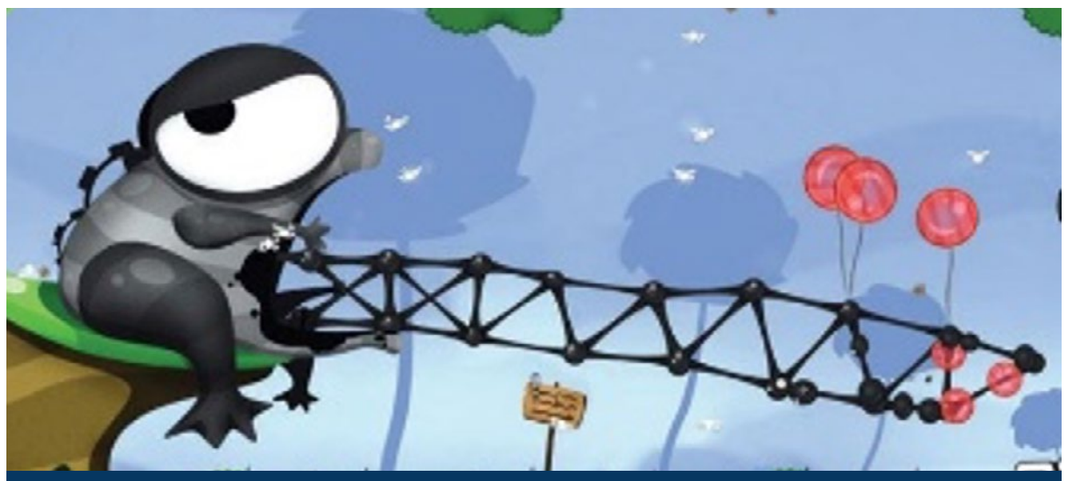
- Avoid providing too many '**false**' pathways that don't allow for successful completion of the level or game.
- Avoid providing too many pathways and creating a **paradox of choice**, in which too many choices cause the player to give up choosing a pathway altogether.

Related to play experiences:

Competence **Autonomy** **Creativity**

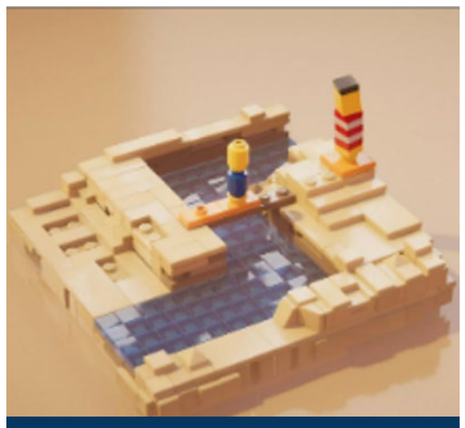
Examples from RITEC research

When players were presented with multiple ways to solve a problem, they found different, creative solutions. In World of Goo, when the game started to become challenging, players were more **incentivised** to try different methods to solve the puzzles. (NYC)



© World of Goo, by 2D Boy

Examples from RITEC research



© LEGO Builder's Journey, by The LEGO group

"I guess (I feel. SG) like joy because, you know, you finally got it. And then like relief. If you've been on the level for a while. So that you think you're stuck, **but then you finally got it.**" (boy, 13, Australia)

LEGO Builders Journey, screenshot shows a player completing a level.

© Zelda (Tears of Kingdom, Breath of the Wild), by Nintendo

On Zelda: Tears of the Kingdom: "I really love that game. And actually, it also I think it's helping me with my school in a way. It's because like, the game encouraged like, thinking a lot and like using critical thinking and stuff. It's my… it's because they're always puzzles. Like, you need to create things and try to figure out a way around things [...] I guess that game was designed so that everyone plays differently? And they have their own way of doing things? [...] They make it so that you can, like, create anything using this ultra hand tool - at all. And there are, like, different ways you can think of things [...] So it's like **there's no one way to do things**. Also, when you go to the mat you get you could go anywhere really and like you could go to four places or you could explore you could go to the chasms below and stuff I mean, you could like get weapons, but each way kind of links to a story makes the experience really fun. And you can solve problems and defeat bosses if you do it in that way." (boy, 12, Australia).

© Zelda (Tears of Kingdom, Breath of the Wild), by Nintendo

Progression Design

Feature Focus:

Retry opportunities

Opportunities to try again were important for some children's emotional well-being and sense of competence. This related to a complex range of contextual factors, including their digital play drivers.

Do's

- Allow for graceful failure and the **option** to try again.
- Consider allowing to **advance** without succeeding and returning later to complete and/or retry the level.

Don'ts

- Avoid **overly** punitive responses to failed attempts at solving a level.
- Avoid creating a situation where there is no way to **learn** how to progress or retry.

Related to play experiences:

Competence **Emotions**

Examples from RITEC research

In World of Goo, children can retry levels they're finding too difficult.

"This connects to her feelings. First, uh, that it's not the rejection - oh, I didn't make it [...] I can't move on [...] I cannot do it. This - that she can start over and **have a chance again**, yes, of course, it helps her a lot." (girl, 10, Cyprus).

Social Play

Feature Focus:

Multiplayer

Opportunities to play with others in the same or different physical spaces, as collaborators and/or competitors.

Do's

- Make sure your multiplayer experience is **safe** and secure for your audience. Interactions with other players might create risk situations, which require mitigating and designing for. More about safety and security.
- Within multiplayer games, allow players to enjoy working **collaboratively** and encourage and support one another. Provide opportunities for players to work together to achieve their goals.
- Consider different **roles** within collaborations. This may provide opportunities for parents and children (or children of different age groups) to play the same game together, even if they have different skills levels. Create collaborative challenges that require each member to have a different skillset, or a different proficiency level.
- Give children opportunities to set **boundaries** around socializing in line with their personal needs and comfort, within multiplayer games.
- Make it easy for children to turn multiplayer off or **control** who they play with.
- Consider using **asynchronous** multiplayer features to allow for play from different time zones of family members and friends.

Don'ts

- Be careful around encouraging **comparisons** between players who are collaborating.
- Do not provide information that suggests one or the other player was more responsible for shared success.
- Don't allow **communication** options that can be abused by players without proper safeguards.

Related to play experiences:

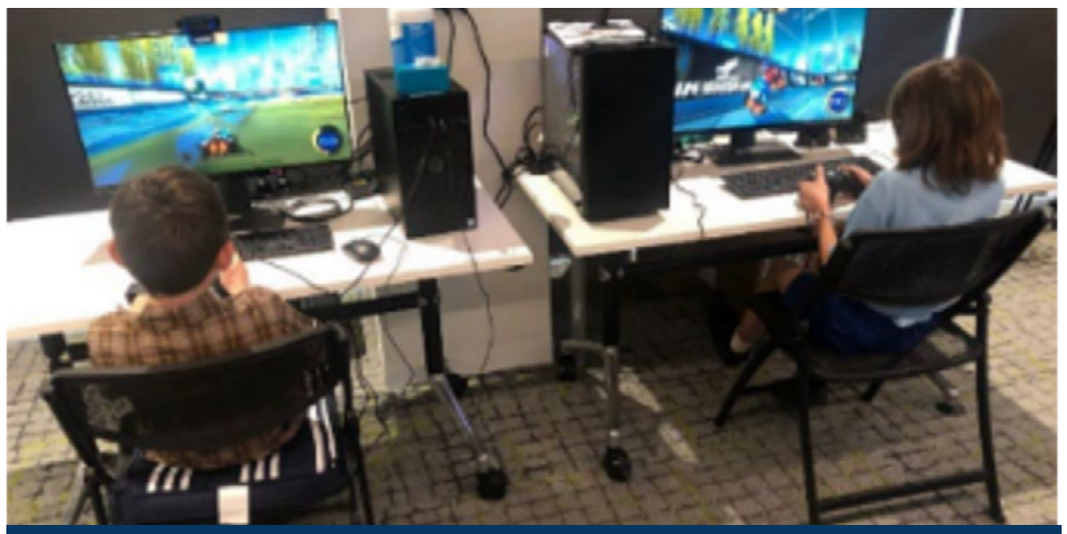
Relationships | **Emotions** | **Identities** | **Safety & Security**

Examples from RITEC research

Working together to score a goal on Rocket League. "Because I think when someone's **encouraging** you, you just feel like you can do it. Like there wouldn't be any bad... You wouldn't miss or anything. And that... because when someone's encouraging you, it feels really, really good. And like you're like, oh, yeah, she's encouraging me, I can do this then. And that's what motivated me. Yeah…" (girl, 12, Australia)

"Um... winning is really fun. And it's super enjoyable because you've won and like that feeling is just super nice. Especially if you've got like **teammates**, because, you know, they've been cheering you on, like, oh, you can score the goal. And other encouragement, it just kind of pays off, especially if you win. So it's really worth ... really worth it." (girl, 12, Australia) (same screenshot)

"[It helps us make] **acquaintances** and increase social relations to raise team spirit." (small group, aged 12–15, Iraq).



© Rocket League, by Psyonix

Minecraft makes it easy for children to control how they want to play, including choosing to turn multiplayer off: "Yeah. I can also turn multiplayer off so I can play it just to me. So, I could be playing it and I'm deciding 'actually I want to **play it by myself**', I could go to Settings and just turn…well I probably had to lose a go, and turn multiplayer off so Mummy and Yara can't join me." (girl, 9, UK).

© Minecraft, by Mojang

Social Play

Feature Focus:

Social Play / with single player games

Even in single player games, children may socialise around the game play.

Do's

- Children socialise around game play even when the games are single player. Provide opportunities to **connect** about the game play, e.g., by sharing in-game creations or scores, strategizing and planning together, and cheering each other.

Don'ts

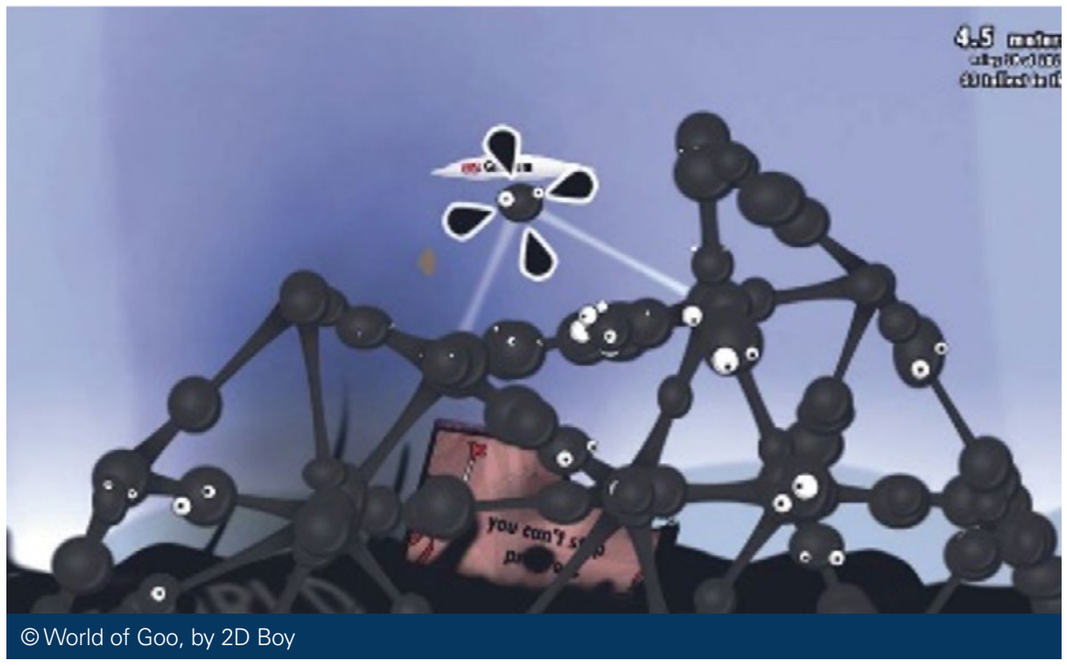
Related to play experiences:

Relationships

Examples from RITEC research

World of Goo contained challenging levels. To solve those levels children teamed up and simultaneously tried different solutions on their iPads. They copied the strategies of their peers to solve the challenging levels.

"Sometimes we'd play different games at our table – we'd **talk** about [it]. Like, if I was playing Rocket League I'd tell my friend how many points I got and if I won the game or not." (boy, 12, NYC)



© World of Goo, by 2D Boy

"[My favourite part was] being able to talk to my friends and **hanging out** with my friends while playing videogames. Because that's what we normally do [at home], but we can't really see each other and play." (boy, 12, NYC)

"I play with friends. I helped them, they helped me. Matheo is the best at playing the games, he has strategy on what to do, and what things do, he played the games before." (boy, 11, NYC)

© Rocket League, by Psyonix

Social Play

Feature Focus:

Solo play

Serves an important function. Solo play is sometimes clouded by concerns that children are lonely or socially disengaged. There is evidence to suggest that solo play fulfils important functions from early childhood and beyond, offering children opportunities to concentrate, contemplate, express control, explore identities, create and relax. Whilst there is a

need for children to experience a balance between social and solo play, some have argued that children in some contexts may increasingly lack opportunities for adequate solo play when they are in adult-regulated social situations for much of their day.

Do's

- Make it possible for children to **choose** how they play, to include meaningful and safe solo play, including through games designed specifically for this purpose and through options to play in different modes.
- If multiplayer options are on, make it easy for children to turn multiplayer off or **control** who they play with.
- When designing for solo play you can use the unique affordances of deeper **concentration** for flow experiences, puzzles and complex strategies.

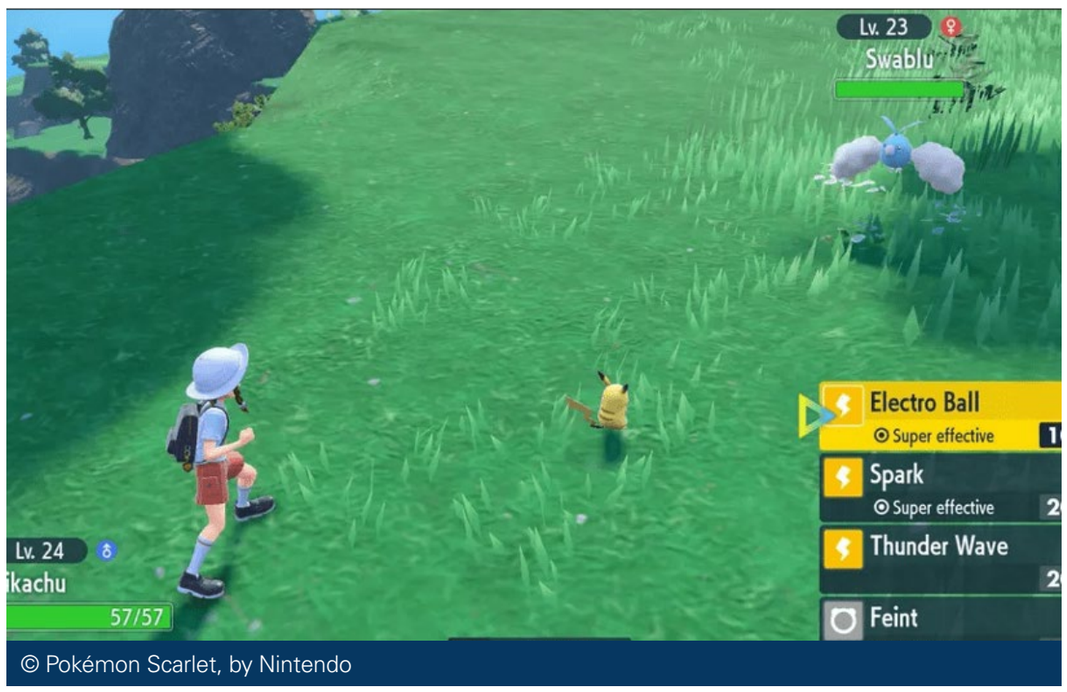
Don'ts

Related to play experiences:

Relationships **Emotions** **Identities**

Examples from RITEC research

On solo play, such as in Pokémon Scarlet or Zelda: "I think just to go off on your own and have **your own time** and your own space" (Mum) "there's a lot of things going on and I need to rest my mind [...] I focus on the game and not anything else" (girl, 10, UK).



© Pokémon Scarlet, by Nintendo

On Candy Crush (single-player game): "[it is] **comforting**...you play on your own when you don't feel like playing with anyone." (small group, aged 12–15, Jordan).

© Candy Crush, by King

Social Play

Feature Focus:

Social Play / Family play

There are clear benefits associated with intergenerational play, including positive emotional experiences, family togetherness and supporting the digital skills of younger children.

Do's

- Consider designing play to meet the diverse ages' needs of different members of the family, such as games whose mechanics enable **tailored difficulty levels** for different players, content that is appealing and suitable across age ranges or options for older relatives with poor eyesight or hearing or more restricted motor skills to select simpler, clearer or bigger interfaces or to use custom controllers.
- Consider designing games so that they can be played (or **adjusted** for play) across children's age groups. A clear desire to play together can result in siblings playing games that are designed for much younger or much older children, which could raise potential issues and threats to well-being in terms of both the difficulty level and content of the games being played.
- Certain game mechanics (or the absence of them) can also hinder desired intergenerational play. For example, younger children may stop playing if an older sibling wins too often. Introducing a simple mechanic to adjust the **difficulty level** of play for children (and adults) of different ages or abilities could foster sustained intergenerational play.
- One strategy is having teams with **different skills** needed by each team member.

Don'ts

Related to play experiences:

Relationships **Competence**

Examples from RITEC research

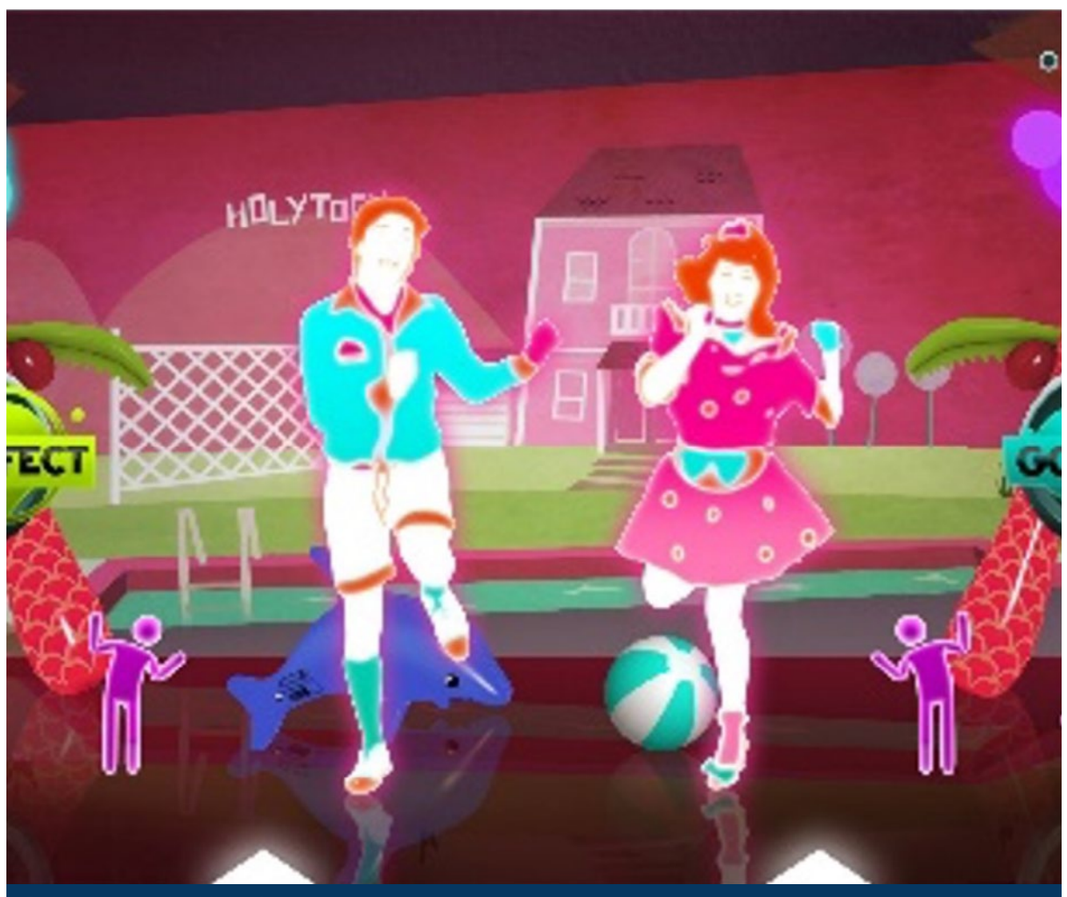
Losing is an important game mechanic, but in the case of intergenerational play, a lack of balance can be a **barrier** to continued play. In Mario Kart, greater difficulty differentiation between players could help foster sustained shared play between siblings of different ages or abilities.

On Mario Kart: "She can't win [...] Because there's other racers that always beat her, so she always comes last." (girl, 10, Australia – her sister stopped playing with her because of this).

© Mario Kart, by Nintendo

In Just Dance players follow the moves of the dancers on the screen: "[A source of] **entertainment** with friends and family. They feel like they fit in with the game; very comfortable." (small group, aged 12–15, Brazil).

"[Games should have] multiple levels and difficulties so people can play to **their own ability** and not feel pressured into doing harder challenges. To have different levels based on how good people are at the game so they don't get mad/sad." (small group, aged 7–15, UK).



© Just dance, by Ubisoft

Social Play

Feature Focus:

In-game communication design

Pre-designed phrases or icons, which refer to the inner/emotional state of the player or address the achievement of the coplayer. Also referred to as ‘emote’.

Do’s

- Make sure your in-game communication experience is **safe** and secure for your audience. Interactions with other players might create risk situations, which require mitigating and designing for. More about safety and security.
- Design to allow for easily establishing **connection** with others.
- Be mindful of **best practices** for your specific audience (age/culture/context).
- Allows players to choose icons/ emotes to **express** joy or anger, instead of typing text. Players can cheer on other players with emotes, which can create humour, and excitement, and reduce use of unsafe language.

Don’ts

- Don’t create situations where young children are at **risk** of exposure to inappropriate communication from others.

Related to play experiences:

Relationships | Emotions | Safety & Security

Examples from RITEC research

Quick Chat **Stickers** in RLS: A player cheered on his NPC teammate using emotes: “He did a good job.” (boy, 9, NYC)

© Rocket League, by Psyonix

Chat with a pre-design controlled vocabulary in Club Penguin

© Club Penguin, by Disney

Character Design

Feature Focus:

Avatars & NPCs

Presenting and constructing player representations, as well as non-player characters (NPCs) appearance and identity.

Do's

- Ensure avatars/NPCs are **diverse**, or universally representative (for example, through minimalism or ambiguity) to make it possible for children to 'see themselves' in games.
- Consider **non-human** and/or fictional avatars/NPCs for creative expression, and identity exploration.
- Consider **customizable** avatars, where players can experience different identities, build creatively, and experience roleplay.
- Consider including **animal** NPCs, which can offer opportunities for children to nurture and care for others.

Don'ts

- Refrain from using **stereotypes** as the basis of your avatars.
- Do not include any potentially **offensive** objects/symbols to your avatars.
- Don't **assume** gender, ethnicity, etc., of players or avatar options.

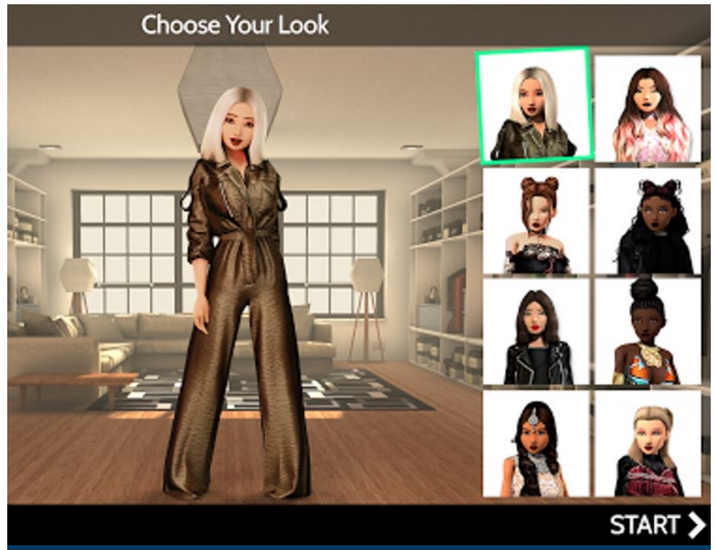
Related to play experiences:

Creativity | Identities | DEI

Examples from RITEC research

Players of Avakin Life don't have to rely on standard avatars and can **customise** to reflect their own appearance.

Stiletto Queen said that being able to make choices in her digital play, including through avatar customization made her feel: "very, very, very good'". (girl, 10, South Africa).



© Avakin Life, by Lockwood Publishing

Bloxburg (Roblox) supports diverse avatar customization. Penny took great pleasure in **exploring** aspects of identity by customizing her avatar in her own style. "Yeah, mmm I do. I make my avatar like ... so I dress my avatar in, like, my own style and then ... yeah. I do change it quite often though". (girl, 9, UK)

One group in Brazil stressed that games should have the option to "create your own character" and have customizable/ **representative** elements, such as having "hair [and] skin colour [options]." (small group, aged 12–15, Brazil).

© Bloxburg, by Roblox

Examples from RITEC research

LEGO Builder's Journey doesn't make the identities or relationships between playable and non-playable characters (NPCs) explicit, which supports **diverse** interpretations.

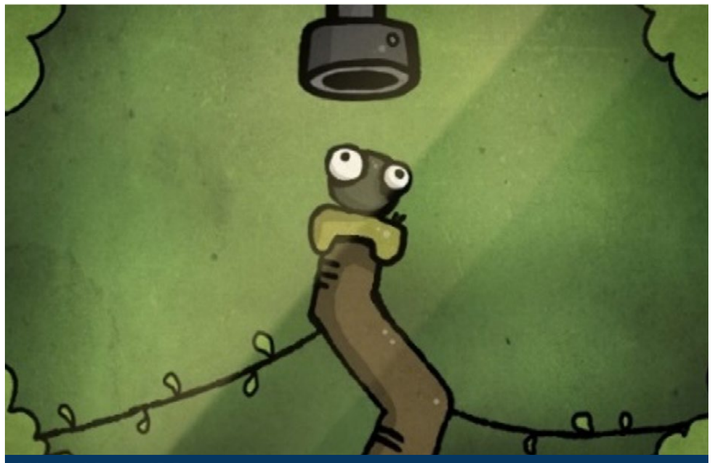
Players of LEGO Builder's Journey interpreted the game's core characters as:

- "Parent and child" (girl, 11, UK).
- "Father and son" (boy, 11, Cyprus).
- "Uncle, nephew and dog" (girl, 10, UK).
- "Son and mother" (boy, 7, UK).

These interpretations exemplify the principle of 'universality', that is, more abstract character designs can 'stand in' for a very diverse range of imagined identities and relationships.

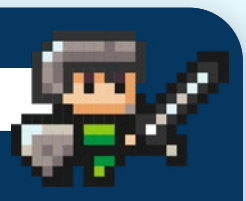
© LEGO Builder's Journey, by The LEGO group

On World of Goo: the Goo Balls are "funny" and "cute" (boy, 7, UK). Even **simple** characters and NPCs designs can be effective in engendering a sense of closeness and endearment, as in the case of the 'Goo Balls' in World of Goo.



© World of Goo, by 2D Boy

Character Design



Feature Focus:

Play perspective (POV)

The character's point of view (POV) of play can profoundly alter the user experience. Some children greatly appreciate first-person play, which can increase feelings of immersion in narrative and emotional experience.

Do's

- Consider first-person play, which can support a greater sense of identification with the characters and narrative for some children.

Don'ts

Related to play experiences:

Emotions

Examples from RITEC research

Players can choose to play Minecraft in '**first-person'**. "Like first-person's like, uh, when you look like human's eyes. You can't look up. Like, you can't take your eyes out and then.. see your back. You can't look at your back. (boy, 9, South Africa)

Romeos (boy, 9 Cyprus) and Tinotenda (boy, 9, South Africa) both said that playing in **third person** did not afford a sense of identity and close connection with the characters and gameplay.

© Minecraft, by Mojang

Congratulations!

SURPRISE

PAGE