Understanding Well-Being in Digital Spaces

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Nearly two billion children across the globe are growing up in an increasingly digital world. Yet even as the ways that kids engage with new technologies constantly evolve, our efforts to attend to their healthy development hasn't kept pace. It's time to prioritize the well-being of children in digital spaces, which we believe requires a collaborative effort across academia, industry, the policy community, and practitioners to understand how the design of digital products and services can advance children's best interests.

One framework that addresses this gap was created by the Responsible Innovation in Technology for Children initiative (RITEC), developed by UNICEF and the LEGO Group and supported by the LEGO Foundation. Initially published in 2022, the framework is based on syntheses of developmental research, qualitative analyses of conversations with children, and quantitative analyses from survey data spanning 30 countries (UNICEF, 2022). It includes eight components: *competence*, *creativity*, *diversity, equity, and inclusion*, *emotional regulation*, *empowerment*, *safety and security*, *self-actualization*, and *social connection*. Each component is multidimensional and draws from developmental and cognitive science.

To bring these ideas to life and to elaborate on their connections to digital design, the Joan Ganz Cooney Center has created this guide for developers of interactive products for children. We provide definitions and summaries from related research and offer recommendations for making digital experiences and products for children of all ages. We hope the guide will spark conversations among creators of media and technology for children, inspire them to consider how their products can support children's well-being, and take action!

WELL-BEING IS HOLISTIC

For children, well-being is physical health and safety but also mental stability and positive emotion. Most importantly, well-being is social, linked to loving others, and being loved by family and friends. (UNICEF, 2022)

LEGAL AND CULTURAL NORMS DEFINING CHILDHOOD DIFFER ACROSS GLOBAL COMMUNITIES

In keeping with UNICEF's research, we define children as those younger than age 18. Where further delineation is needed, ages are discussed in terms of broad developmental categories, such as early childhood, school-aged, and adolescents.

Competence

How can my product increase a child's sense of competence?

Building new skills and knowledge across the many dimensions of life– social and emotional, cognitive and academic, physical, and cultural– is key to children's well-being. With learning and mastery, we develop a sense of competence. We are able to complete specific tasks, experience increasing independence, and feel satisfaction from our capability.

Because children's minds change and grow, "competence" looks different at different ages. For instance, social competence evolves with development of complex cognitive skills needed to intuit another person's perspective. For very young children, social competence may look like helping others or taking turns, while older children may be mastering skills to make new friends, navigate disagreement, or participate positively in group settings. Adolescent social competence, of course, involves navigating more nuanced social dynamics and norms with ever decreasing adult oversight and support.

As they grow, children also develop what's known as executive function, a suite of thinking skills that enable kids to exhibit memory and attention, shift focus from one task to another, and follow instructions. As executive function skills grow over childhood, children are increasingly able to manage multiple ideas or process multi-step directions. In this way, development of executive function is foundational to a wide host of competencies.

To maximize competence, children should experience an optimal challenge in activities: too little challenge, and children will experience boredom; too much challenge, and they will feel overwhelmed. Aligning capability to challenge promotes sustained engagement and perseverance in a task or activity, contributing to increasing competence.

Children often describe or show themselves as competent users of digital media. They report feeling capable of navigating their own digital devices, including time spent on them. Comparatively, parents and other important adults in children's lives frequently report feeling less competent than their child, particularly within the digital spaces the child most frequents.

Studies provide evidence that positive digital play can have a positive effect on children's content knowledge (e.g., mathematics) as well as their ability to reason, remember key details, and use information to reach a goal. Additionally, games with an educational purpose have been shown to increase children's competencies in other areas, including their ability to build and maintain friendships, manage their emotions, and build skills that children describe as important to them, like sports. Importantly, product designers should consider how digital game design elements, like sounds and effects, are used within their products. These elements can be distracting to young children, impeding their ability to understand and remember information and learn new skills.

TIP

Products that challenge kids but feel within their grasp contribute to increasing competence. This can be achieved by offering multiple paths of varying difficulty through an experience and providing scaffolds.

Additionally, you might consider:

+ How does my product support children to develop both knowledge (e.g., math content) and underlying developmental skills (e.g., turn taking, memory, motor skills)?
+ What supports can be provided so that a wide range of children find success engaging with the product?
+ How might I know whether the experience of engaging with the product is too easy, too challenging, or just right?
+ How might my product give feedback to children in a way that encourages their continued efforts and engagement?
+ Are there any design elements within my product that may serve as distractions to children's learning or impede their mastery of a skill?
+ How can my product support intergenerational play and learning between children and their grown-ups?

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Creativity

How might my product spark creativity in young users?

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 characterized by thinking strategies that expand possibilities (known as divergent thinking) coupled with evaluative selection from these imagined options (known as convergent thinking).

Creative output depends on a suite of skills and dispositions, including:

+ Flexible thinking;
+ Risk-taking, tolerance of ambiguity, openness to experience, and persevering through challenges;
+ Recombination and synthesis of ideas to surface unique solutions; and
+ Invention, creation, and expression through various mediums and with wide-ranging purposes (e.g., visual art, writing, movement, coding, building, design).

Creative development can be encouraged and taught– or discouraged and foreclosed– 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.

Imagination and play, both central to well-being in childhood, are precursors to fully developed creative capacity. Pretend play, storytelling, and role-playing with peers encourage fantasy and make-believe while also allowing children to work through feelings and express emotions. They give children a chance to adopt varied roles and transform objects into props (e.g., a Duplo becomes a cell phone), and they provide a forum for children to practice what researchers call counterfactual thinking (e.g., what if instead of being the baby girl, I play the role of the dad). All these play patterns support children to develop flexibility in their thinking, which is fundamental to creativity.

For children, the connections amongst creative output, mindset, and emotions are particularly important. Regulating excitement about ideas, persisting and managing mood when one's ideas are rejected or don't work out, and coping with self-consciousness about originality are all examples. Digital experiences may create low-stakes environments for children to experiment with creative interests and develop emotional regulation needed for sustained creative action.

Digital play can be especially useful for leveraging creative thinking in children. For example, video game play across a range of genres is associated with greater levels of creativity in storytelling tasks. Digital play can also provide a venue for children to explore what is possible or "allowed." Some researchers suggest that providing support for and encouraging children to push boundaries (e.g., utilizing a product in ways it was not initially intended or tailoring use to suit one's needs) can promote creative thinking.

Importantly, research has shown that people tend to be most creative when they are motivated internally (what researchers call intrinsic motivation) rather than driven by external rewards like badges or scores.

At the same time, research has shown that the willingness to be original can diminish as young people move from childhood to early adolescence. Social pressures to fit in can begin to impede creative thinking. Product designers can support creativity by being mindful of extrinsic rewards in their products and inviting unique solutions and ideas.

TIP

Open sandbox elements and other opportunities for open-ended play, creation, and story generation can spark creativity.

Additionally, you might consider:

+ How does my product encourage imagination, fantasy, or role playing?
+ Where are there opportunities for players to develop creative confidence by taking risks, pushing boundaries, or trying new things?
+ How might young players be invited to generate and choose amongst many possible solutions, or synthesize ideas or items to come up with something new?
+ How does my product allow kids to build, make, or express themselves?
+ How does my product reward kids who think differently or encourage intrinsic motivation?

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Diversity, Equity, and Inclusion

How might I design an experience where all children feel welcome and safe?

Products designed with the core values of diversity, equity, and inclusion ensure all children can participate in digital play. Diversity refers to the acceptance, recognition, and appreciation of differences among individuals, perspectives, and experiences. Equity is the practice of recognizing and removing barriers or offering supports so that all can participate. Inclusion is the practice of creating environments where all *feel* welcome. Research shows that children feel most safe, secure, and welcome when digital games are fair, accessible, representative, and reflective of various people and experiences.

Play offers children opportunities to develop social skills and cultural practices that welcome and value others. Presenting nuanced details about characters in stories, games, or other materials can expand children's connection to a range of interests, identities, careers, and hobbies.

On the other hand, research also shows how digital media can reinforce harmful negative stereotypes around race and gender. For example, when researchers asked children who to cast for a particular role (e.g., superhero, villain) or who is likely to display specific characteristics (e.g., smart, poor), children's responses often reflected negative tropes and stereotypes. This demonstrates the importance of positive and diverse representation of people and perspectives in the products we make for children.

Inclusion and exclusion in digital environments can occur through multiple forms of rules and power. At the individual level, exclusion can arise from interactions between people, such as when children bully each other or when their social attention varies based on characteristics such as gender. Exclusion also occurs when children lack access to digital technology. This lack of digital equity contributes to gaps in digital skills and knowledge, with youth from higher socio-economic communities being more tech-savvy and more likely to participate in programs and opportunities for gaming.

At the same time, well-designed technology can also increase access and improve engagement. For instance, online virtual worlds have been shown to provide neurodivergent and neurotypical youth with a space for participation, collaboration, and communication with each other. Co-designing with a diverse range of users– including young people from varied cultural and social backgrounds, experiences, preferences, and goals– is one effective approach product designers are using to meet the wants and needs of diverse children.

TIP

Build for and test with a diverse set of users. Considering not only race, language, gender, and age but also neurodiversity and a range of tech confidence and competence.

Additionally, you might consider:

+ How might I know or measure whether children feel that they belong with the community of users for my product? What groups feel more or less represented or welcome and why?
+ How are norms of inclusion and civility established and upheld? How does the experience ensure that children are not subject to harmful stereotypes?
+ How might in-game controls, supports, and opportunities for playful interaction engage all players with varying needs and technological abilities?
+ Where might we invite a diverse group of children into the design process? What does it take to work effectively with a range of children so all feel safe to share and participate?

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Emotional Regulation

In what ways might my product support children to develop awareness of feelings, both their own and others', and learn to manage their feelings constructively?

Children are inherently social beings, wired from the beginning 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.

Emotional regulation is the process of adaptively monitoring and managing heightened emotions to adjust to context. This includes being aware of one's own feelings and its connection to behavior as well as intuiting others' feelings based on facial expressions and reactions. Research shows that children learn emotional regulation through their environment and with support. For children, building vocabulary to describe a nuanced range of feelings (e.g., the difference between surprise and shock or between disappointment and sadness) is foundational.

Engaging in play, including digital play, provides children with a lower-stakes opportunity to practice and build emotional regulation. For example, pretend play allows children to safely imagine and enact a range of scenarios with emotional impact.

Play often provides avenues for children to process important emotional events, both those that have occurred in the past and those they anticipate. Children experience a range of emotions like frustration, joy, and disappointment through play and develop the skills needed to recognize and respond to their emotions. Social play calls on emotional regulation skills, since play often involves a collaborative negotiation of rules, ideas, or direction of play, skills needed to maintain positive peer relationships.

It is also important to recognize that digital play, in particular, may be associated with emotional dysregulation. Transitions are often hard for children, especially when they are engrossed. Many digital experiences are designed to keep our attention for long periods of time. Children may find it difficult to transition away from digital play, especially when it is interrupted or there is a perceived lack of closure. So, while digital play sessions are typically enjoyable experiences, they can also trigger emotional dysregulation, such as meltdowns or tantrums.

TIP

Products can play an important role in teaching children to recognize, name, and manage feelings. Consider ways that your product might offer children new words for complex feels or build their capacity for intuiting others' feelings.

Additionally, you might consider:

+ How can your product maximize positive emotions, support children through negative emotions, and avoid elements that could trigger dysregulation?
+ How might your design encourage children to express a range of emotions in safe and appropriate ways, both through their play and resulting from it?
+ How might particular elements in your design cause negative feelings for children? What can you do (both within and as children transition away from the play experience) to support children as they manage negative feelings?

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Empowerment

How can product features and design promote choice and autonomy?

Even very young children desire a sense of agency and benefit from opportunities to make choices. Empowerment is broadly defined as gaining or having control over one's life and is often linked to a sense of autonomy and self-efficacy, or the internalized belief that you are able to achieve what you set out to do. Research indicates that children develop agency when they are offered opportunities to make choices. A sense of empowerment may also result from overcoming challenging experiences and problem solving.

The nature of empowerment differs across individuals, ages, and environments, so it is critical to understand the cultural conditions and contexts that support opportunities for agency and choice. Children and youth experience varying levels of participation and decision-making, both as they grow and across contexts. For example, teachers may offer varied opportunities for choice; children may also navigate differences between school and home. Across most contexts, however, adults set boundaries. As such, child-directed play is an important arena for children to experience choice and empowerment.

Empowerment is particularly important for adolescent development. Some scholars have described it as involving an awareness of the self and others, identifying and developing one's strengths, and resisting external pressures including those of peers and sometimes even parents. Additionally, of course, adolescents are still developing the capacity to think through their decisions, including when and how their choices might lead to consequences or negatively impact others.

Across digital environments, much like in "real" life, children benefit from purposeful and scaffolded supports that build their ability to be active and mindful participants in online spaces. For example, recent apps encourage young users to pause and reflect before sending messages online as a scaffold to support prosocial behavior. Importantly, well-designed scaffolds are not there as controls but as supports as young people develop agency and decision-making skills.

Increasingly, youth are voicing discontent over the way that algorithmically-driven digital media can disempower them, making them feel a loss of control over time and attention. That said, digital environments, particularly digital play, have the potential to empower kids through design. Digital play typically involves a form of agency where players in a game have some control over what can be done or occur in a game, or even how a game is experienced. Additionally, researchers have documented ways that digital products, such as virtual worlds within games, have actively involved users in decisions about upcoming game features. While done to promote a sense of connection and belonging in their game community, such engagement strategies could promote empowerment broadly among users.

TIP

Provide elements that give young users choice and offer opportunities for meaningful decision-making within your product.

Additionally, you might consider:

+ Where and how does your product encourage children's independence, including expressing their thoughts, feelings, or opinions?
+ How might your product build young people's agency related to skills or experiences that they are most interested in?
+ How might your product development and design give children control of features and/or ways to engage, including when to stop using it?
+ What messaging or components aimed at caregivers or educators might be helpful to ensure a child experiences autonomy and choice when using the product?

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Safety and Security

Does my product uphold children's rights to privacy and safe participation?

While notions of safety may depend on societal values and evolve across the lifespan, safety is generally understood as a feeling of being secure and protected from harm. For children, safety does not necessarily mean a complete absence of risk; instead, children feel most safe in the company of trusted caregivers who can help the child interpret potential danger. Environment– particularly a predictable environment, with the presence of norms or routines– is also important to safety. At the same time, the enforcement of restrictions and boundaries can have unintended consequences, like limiting access to exploration and appropriate risk-taking, both of which contribute positively to identity development, skills for managing emotions, and meaningful relationships with others. Additionally, inequitable or inconsistent enforcement can cause young people to feel less safe, especially if they believe that the root is bias or stereotypes.

Adults often express concern about threats to children's safety online, though research indicates parents have different approaches to navigating technology and fostering kids' safe digital practices. Some parents closely monitor and restrict media use, though research shows that children desire guidance and support from trusted adults, as opposed to adult management of their safety and privacy without their involvement. Unfortunately, policies and practices aiming to keep children safe online often exclude children's voices from such conversations.

Importantly, some kids may be able to recognize online situations that put them at risk of harm and/or scenarios that require assistance from caring adults or moderators. However, research shows children do not always tell a trusted adult about unsafe or complex online situations for a range of reasons, often influenced by age and gender. Additionally, when disclosure of a problematic online experience leads parents to limit children's online access, children may experience protective measures as punishments.

Open, transparent communication particularly between children and their parents (or adolescents and their teachers), can help young people trust adults to support them. Additionally, talking to kids openly about their online experiences leads to more careful decision-making about safety and privacy among youth. Product designers have a role to play, too. One way to increase a sense of safety is to provide guidance within a product about what a kid can do if they see or experience something harmful, to make reporting processes easy, and to encourage kids to reach out to the adults in their lives for guidance and support.

Having choice about the sharing of personal information matters to children, and while children may generally believe they have such control, the reality is more complex. For one, digital spaces offer varying levels of privacy, and features differ across platforms. Additionally, individuals define privacy differently, shaped by societal norms, identity, and know-how. For instance, older children are less likely to demonstrate privacy protecting behaviors related to disclosing personally identifying information on social networking sites. A range of factors– including perceived popularity, ethnic-minority status, and gender– have been shown

to influence whether a young person is more or less likely to use privacy features including private social media profiles.

Communication features (e.g., pre-scripted or free-text chat options) and modes (e.g., text and voice) also influence what children share with others and can vary across platforms. The selection of features can present tensions and tradeoffs between self-expression and connection with others, on one hand, and protections from over-disclosure of information or sharing with unintended audiences. Product designers can support children to make intentional decisions by ensuring transparency. Products that incorporate auto-generated checks when young people are sharing certain personal information show promise in helping young people to pause and reflect prior to posting.

TIP

Invite children into your design process to hear from them about features and common issues that support or impede a sense of safety and control over privacy.

Additionally, you might consider:

+ How might your privacy policies be communicated with simple language, for both children and their parenting adults?
+ How do children learn about your security and monitoring policies, and what could be done to make these fully transparent and easy to navigate?
+ How might your product encourage dialogue between parents and children about potential online risks and ways to manage them?
+ What community management is in place to counter toxic or predatory behavior?

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Self-Actualization

How can my product support young people to explore who they are and what matters to them?

Self-actualization is often defined as having a sense of purpose. It involves realizing one's potential by pursuing personal growth and developing a strong sense of self. Self-driven exploration and, particularly, the discovery of areas of individual interest support children's process of self-actualization.

Confidence and sense of self are both foundational to self-actualization. Children can build these foundations by participating in personally meaningful activities, taking risks, and developing a mindset of learning and growth. In these ways, kids develop purpose and find fulfillment. Reinforcing the idea that all people are learners, that learning lasts a lifetime, and that learning is the result of effort over time encourages kids to try new things and feel comfortable being a novice pursuing something of interest.

Research suggests that self-actualization develops with age and into adulthood. Adult self-actualization positively contributes to interpersonal relationships and quality social connections. For teenagers, the desire to conform to group norms may interfere with self-actualization, as the need to fit in with peers can outweigh being true to one's own ideas, interests, and beliefs. Importantly, research suggests that digital spaces may create a needed space for adolescents, in particular, to engage in processes of self-actualization. Using digital tools can provide teens important pathways to express themselves creatively, acquire self-knowledge, and contemplate their future, including possible career options.

TIP

Incorporate messages and processes that support a learning mindset and welcome novices.

Additionally, you might consider:

+ How might my product encourage children and youth to express individual thoughts and pursue self-driven interests?
+ In what ways does my product allow for self-discovery and support children to take risks?
+ Where can children alter characters or avatars to express individuation or reflect themselves?
+ In what ways does my product support kids to embrace the pursuit of purpose and believe in their individual worth?

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Social Connection

How do children create community and experience belonging through and with my product?

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 community. Connection involves interacting and communicating with others as well as establishing and maintaining relationships. Strong social connection predicts a range of positive outcomes, from physical health to academic achievement. Connection is associated with a sense of belonging.

Relationships often develop from shared interests and experiences. Social factors, including gender, race/ethnicity, language, and nationality also influence relationship-building. For children, gender is one of the most salient factors for choosing playmates and developing friendships. Children may play with a range of individuals, but deeper connection confers particular benefits: when children play with friends, the interactions tend to be more prosocial, supportive, and cooperative than when they play with peers who are not friends.

With the rapid rise of new media, social connections in digital spaces are growing and unfolding in various ways. Many adolescents have a "portfolio" of regularly-used social media platforms. Youth describe digital technology as a tool that they can use to communicate and create meaning with others. While they can view their use of digital media for entertainment purposes as a "waste of time," particularly when used excessively, teens also report that their digital media focused on connecting with peers and friends is advantageous, satisfying, and rewarding Youth may continue to view "real life" interactions as particularly valuable, but digital connections help to establish and maintain relationships, promoting positive feelings of integration with others. In contrast, perceived anonymity online among adolescents can contribute to negative online interactions, such as cyberbullying.

For younger children, parasocial relationships– attachments children make to favorite media characters or personas– are common and important. Research shows that these friendship-like connections can foster children's learning across a range of topics, like math and science.

Digital games also show benefits for social connection for young people. Games can increase intergenerational contact, mutual awareness, and understanding and provide a space for interaction. Games that encourage individuals to work together to achieve a common goal may be particularly helpful to young people's development of social connection.

Online gaming platforms can be useful for fostering friendships. Tools for communication (e.g., in-game chats, third-party servers) and control (e.g., parent dashboards, customization features determining what content can be accessed by a player) support multi-modal interactions between players, but they can vary widely across gaming platforms and environments.

TIP

Include a range of communication features that children can adjust to play with friends and make other connections online that feel safe and supportive.

Additionally, you might consider:

+ How might my product encourage children to work together toward a shared goal or purpose and build prosocial skills including conflict resolution, flexibility, turn taking, and communication?
+ What features might encourage inclusion and connection amongst diverse peer groups, including neurodiverse players and those with less technological access?
+ What could enhance safe, intergenerational play, including play with parenting adults and their children together?

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