

EDITED BY REMCO PIJPERS & NICOLE VAN DEN BOSCH

# POSITIVE DIGITAL CONTENT

FOR KIDS EXPERTS REVEAL  
THEIR SECRETS







# POSITIVE **DIGITAL** CONTENT FOR KIDS

**EXPERTS REVEAL THEIR SECRETS**

EDITED BY REMCO PIJPERS & NICOLE VAN DEN BOSCH

POSCON & MIJN KIND ONLINE



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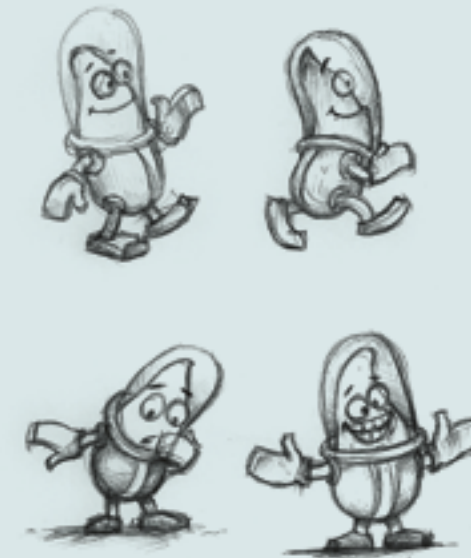
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# THE INTERNET IS A FANTASTIC PLACE TO LEARN



**N**owadays, most of us access online content from many different devices, such as smartphones, tablets and computers. Many of us produce online content too. Either way, the Internet is a fantastic place to learn, play, interact and explore.

My job as European Commissioner for the Digital Agenda is to ensure that all Europeans can benefit from digital technology – including kids, who are going online at a younger and younger age and for an ever-greater variety of reasons.

To create a better Internet for kids, we need to set our sights beyond protecting them. Our aim is to encourage creativity and a positive use of the Internet. This will not only help children and young people develop their digital skills but also empower them to grow and shape their world in a safe, creative way.

There is no ‘One Size Fits All’ solution. We should work on flexible solutions and concepts that are appropriate for the age of the child. A plethora of gaming, educational and interactive apps are available that successfully target children and young people. But children are also the most vulnerable consumers. We need to be able to protect young users from emerging risks, such as exposure to advertising, excessive online purchasing in virtual worlds, and in-app purchases.

Engaging industry across the value chain is central to tackling the growing challenges that are arising as the result of new technology and new user patterns. Reports from the companies participating in the [CEO Coalition](#) to Make a Better Internet for Kids show that they have made concrete progress by sharing and renewing good practices and speeding up the development and implementation of reporting mechanisms, age-appropriate privacy settings, content classification, parental tools and the effective removal of

child-abusive material. All of these contribute to making the Internet a place where children can have positive experiences.

However, progress in this area is a shared responsibility, and the [POSCON network](#) – funded by the [EU Safer Internet programme](#) – has also been very active in gathering experts from the public and private sector from all over Europe in order to exchange their experiences and devise plans for stimulating positive online content for children. Together, they have come up with ‘Golden Rules’

for developing digital products for kids, such as target group and age appropriateness, attractiveness, usability, reliability, safety and privacy issues.

The same criteria have been applied in selecting the winners of the [European Award for Best Content for Kids](#). On [Safer Internet Day 2014](#), I had the honour

of handing out prizes to the best creators of positive content for kids (some of them actually themselves kids and young people who code) selected from over 1100 entries from all over Europe and beyond.

Now, POSCON is launching another exciting project: a compilation of best practices from European producers who create high quality digital content for children. In this new book, for example, you will discover how an app can make it easy for kids to do research at home with the family in the real world – an app that encourages kids to ask good questions and have the feeling that they can investigate things by themselves! Again, this is an important acknowledgement that we all have to work together in order to give kids of all ages across Europe access to positive experiences in an environment that guarantees trust and confidence.

## NEELIE KROES

Vice-President of the European Commission responsible for the Digital Agenda for Europe (2009-2014)

## WE NEED TO BE ABLE TO PROTECT YOUNG USERS FROM EMERGING RISKS





# CHILDREN & MEDIA

**VIEWPOINTS  
FROM EXPERTS**

SONIA LIVINGSTONE  
&  
PATTI M. VALKENBURG



## POSITIVE ONLINE CONTENT FOR CHILDREN

# LET KIDS CREATE AND PARTICIPATE

How do children develop, and what influence do digital media have on their development? What do producers of digital content for children need to know, and how can they contribute to the next generation? **Sonia Livingstone**, Professor of Social Psychology at the London School of Economics and Political Science, explains her views on positive content for children.

Illustrations Nozzman



**C**an you briefly describe how children develop from birth to the age of sixteen?  
Sonia Livingstone: 'That's a huge question. Children not only develop physically but also mentally, emotionally and socially, all over varying timelines. Most current research has thus far focused on what kids understand from reading and watching television. Children learn first to focus, then to sequentialise and infer patterns, and only then do they grasp causation, narrative and characterisation. Research on drama shows that children enjoy and are afraid of different contents at different ages, and that what they say isn't always a good indicator of what they remember, understand or have nightmares about.'

Lots of research examines advertising. Here it is generally agreed that until about eight years old, children don't have a very clear concept of what advertising is for; after that, they begin to grasp the notion of persuasion but can't really apply it in their daily lives. So they will still ask for what is being advertised, even though they are aware of the advertising intent. By around the age of twelve, children's judgements become more sophisticated – they can distinguish persuasive from non-persuasive content, for instance, though

## PARENTS HAVE THE MOST INFLUENCE ON CHILDREN'S BEHAVIOUR



## TEST WHETHER KIDS LEARN FROM, LAUGH WITH OR FEAR WHAT THEY'VE SEEN

they might still need a helping hand, especially in relation to the news or online marketing (as might many adults!).

Children are also influenced by the context in which they live: kids in different cultures don't all grow up the same, and the resources (or barriers) which define children's developmental processes vary greatly. The main debate among academics is whether biology, psychology or society has the upper hand, but of course it has to be a mix.

The immediate social context is also vital. If there are problems at home, the compensatory potential of the media becomes all the more important, as does its power to exacerbate problems. If the

family context is supportive and communicative, however, kids can cope with much of what they find in the media, even if the media content is rather poor or problematic. Parents have the most influence on children's values and behaviour – the media will never compete with their influence. But the two can work together to help kids develop in a confident and positive way.'

*How should producers take this all into account?*  
'Audience- or user-testing is extremely important. I know this is expensive and seems ethically and practically difficult with children, but it is crucial. It is generally done more for expensive productions (television, film) than with cheaper productions (for instance, websites or games). And of course, it may not happen at all with content designed for the general public (or other market segments) even though it is also enjoyed by children. This means that children, with their specific needs and niches, may be exposed to inappropriate materials of all kinds, that haven't been tested on them as age-appropriate.

I would also urge producers to commission thoughtful interpretations of the research literature (especially psychological and socio-cultural works on what children know, understand and feel), and then to do careful audience/user testing while developing their products. By this I don't mean just testing whether children like a blue or a green background or this or that cartoon character, but whether they learn from, laugh with or fear what they've seen – even a full month or year later.

## THEY WANT TO PARTICIPATE, THEY WANT TO CREATE

# SONIA

## LIVINGSTONE OBE

Professor of Social Psychology and former Head of the Department of Media and Communications at the London School of Economics and Political Science



Sonia Livingstone has dedicated much of her research to children, media and the Internet. She is the author or editor of 18 books and many academic articles and chapters. Sonia's research asks why and how the changing conditions of mediation are reshaping everyday practices and possibilities for action, identity and communication rights. Her empirical work examines the opportunities and risks afforded by digital and online technologies, including those for children and young people at home and school. She is co-coordinator of EU Kids Online, which focuses on the way children use new media and the conditions which shape online risk and safety. Sonia Livingstone was awarded the title Officer of the Order of the British Empire (OBE) in 2014 for her services to children and child Internet safety.

#### MORE INFORMATION

- LSE Academic Staff: [stmko.nl/sonia](http://stmko.nl/sonia)
- EU Kids Online: [stmko.nl/research](http://stmko.nl/research)
- [www.lse.ac.uk](http://www.lse.ac.uk)





More fundamentally, producers need to think about their purposes. The purpose of good online content should surely include treating children as young citizens capable of learning and furthering their personal, social and intellectual development. Too many sites seem to put effort into keeping children quiet and absorbed and amused. But we should be more ambitious for them. They want to participate. They want to create.'

*Digital media are evolving rapidly. How does that affect children? Is childhood also changing rapidly because of their exposure to media, or is that a silly question?*

'It's an interesting question. There's been a lot of speculation about children's changing skills (as so-called digital natives), their supposed loss of concentration (not to mention loss of privacy and intimacy), their ability to multi-task and their changed styles of learning ('interest-driven', 'just-in-time', 'look it up when you need it'). There's remarkably little evidence for any of these cognitive changes, it must be said. When one study is published showing a change, the next study will contradict it. We're still waiting for a solid body of evidence either way, and ideally we'd have some longitudinal studies to track changes over time.

There is more evidence that the social and cultural circumstances of children's lives are changing. In other words, childhood itself is changing. These changes have been summarised simultaneously as 'getting older younger' (more marketing, sexual expression, and identity exploration among tweens, for instance) and, conversely, 'staying younger longer' (since it takes longer for young people to become financially independent, they have a longer period of adolescence; followed, some now say, by a period of 'emerging adulthood' in which they explore commercial culture widely, following celebrities, experimenting with social media and generally focusing on themselves and their relationships). Then there's the effect of media trends – more personalised devices, converging platforms which combine mass and social media, reading,

viewing and chatting; and more complex interfaces – with embedded marketing and complex conditions of data collection or privacy or risk.'

*How do you define 'positive content' for children?*

'According to the UK's 2013 Good Childhood Report, children and young people need:

- The right conditions in which to learn and develop
- A positive view of themselves and respect for their identity
- Enough of the items and experiences that matter to them
- Positive relationships with their family, friends and school
- A safe and suitable home environment and local area
- The opportunities to take part in positive activities which help them to thrive



'So one answer is: Any media meeting these needs offers 'positive content'. Wrapped up in the first bullet point is the importance of play, imagination, creativity and being stretched (but not too far). Wrapped up in the last point is the importance of pathways or trajectories – yes, kids like repetition, but they also need to be taken on a journey, encouraged to explore and develop and progress. The end of the journey might never actually arrive, but the journey should be what kids

(not worthy or judgemental adults) find really stimulating. Educationalists call the support that this journey needs 'scaffolding' – in this case, media builds the scaffold, enabling children to climb higher and see further. But the media needn't be the sole provider of said scaffolding – the content kids engage with can also appeal to their parents and friends or siblings, and it can encourage play and discussion in front of the screen, in the living room or during supper, for example.



**CREATE A CHILD-FRIENDLY WORLD  
IN WHICH THEY CAN PARTICIPATE**



## THEY NEED TO FEEL THAT THEY CAN MAKE CHANGES IN THIS WORLD

‘Last but not least, the points in between are all about removing the barriers that hinder kids and giving them a child-friendly world in which they can participate – this means that they can join in with others, with respect for their own contribution, and can feel efficacious. This last point is more complex than it sounds. We too often build walls around kids which then hinder their efficaciousness – they need, slowly but surely, to feel that they can make changes in the world. Most importantly, they need not only to speak and act but also to be heard and responded to. And they need to be heard by those with the power to affect their circumstances – and, later in turn, the wider world. These are serious requirements. In a thoroughly-mediated world, they should be met, to a significant degree, by the digital media.’

*How can producers implement your view into their work? What does ‘good’ look like?*

‘What do we want available for our children? We want diversity, including a diversity of aesthetics: not everything made for three year olds, for instance, should have bright colours with happy cartoon figures bouncing around. Let’s diversify what is being offered. And let’s also diversify our concept of children themselves, for children come in all shapes and sizes. Over and over again, you see pretty white girls, handsome white boys and then one brown face. That’s so stereotypical. Where are the ordinary kids – a little bit grubby, not all nicely matching in size, not all middle class and squeaky clean, perhaps even disabled? Research shows that children want to see themselves reflected, and since children are truly diverse, so too should be their representation on screen. Essentially, kids want to feel recognised, validated and that their identity has some significance.’

*What are the biggest blunders you have witnessed in the media landscape for children? Where did the producers go wrong?*

‘In the long list of submissions we received when I chaired the jury of the European Commission for the European Award for Best Children’s Online Content, we saw the following ‘problems’. Sites where the navigation was confusing, where even the jury got lost. Sites for children where a mere click or two took you into a generic/adult world.

Sites full of invitations to buy, go to ‘the shop’, and advertising (not always age-appropriate advertising at that). Site after site with adult middle-class male voice-overs (seemingly) patronising kids. Sites with so much loud jingly music and jolly bright colours that we all got a headache. Sites for young children that easily led us to explicit sexual advice for older teens! Sites that had one clever idea but no progression and nothing to do once you’d done it. Sites that locked you into their simple world and never stimulated the imagination or offered a journey of development or exploration or even interest. Worthy sites to teach maths or science that were even duller than your worst teacher. Sites so complicated that I couldn’t figure out the rules of play. I could go on....

By implication, of course, the sites that meet the above-mentioned conditions of positive content and avoid said blunders can be truly great. It’s difficult to list these, as they vary so much depending on the child. I’d love for there to be more prominent awards celebrating great content for kids – such as we have for children’s books or films and television shows. Though of course I’d love for there to be more diverse content for kids, I’m equally concerned that when it does exist, kids can’t find it or simply don’t know about it. As I see it, the digital network age from a child’s perspective is largely a matter of both missing and missed opportunities. I hope the readers of this volume can change this! ☒

## WHERE ARE THE ORDINARY KIDS? A LITTLE BIT GRUBBY, NOT ALL MIDDLE CLASS AND SQUEAKY CLEAN



THE EFFECTS OF MEDIA USE ON CHILDREN

# THE TELETUBBIES CONTROVERSY & THE VALUE OF ENTERTAINMENT

How do digital media influence our children's development? What does recent scientific research say about the effects of media use on (young) children? Professor **Patti M. Valkenburg** of Media, Youth and Society at the University of Amsterdam fills us in on the developments in her field of expertise.

Illustrations Nozzman

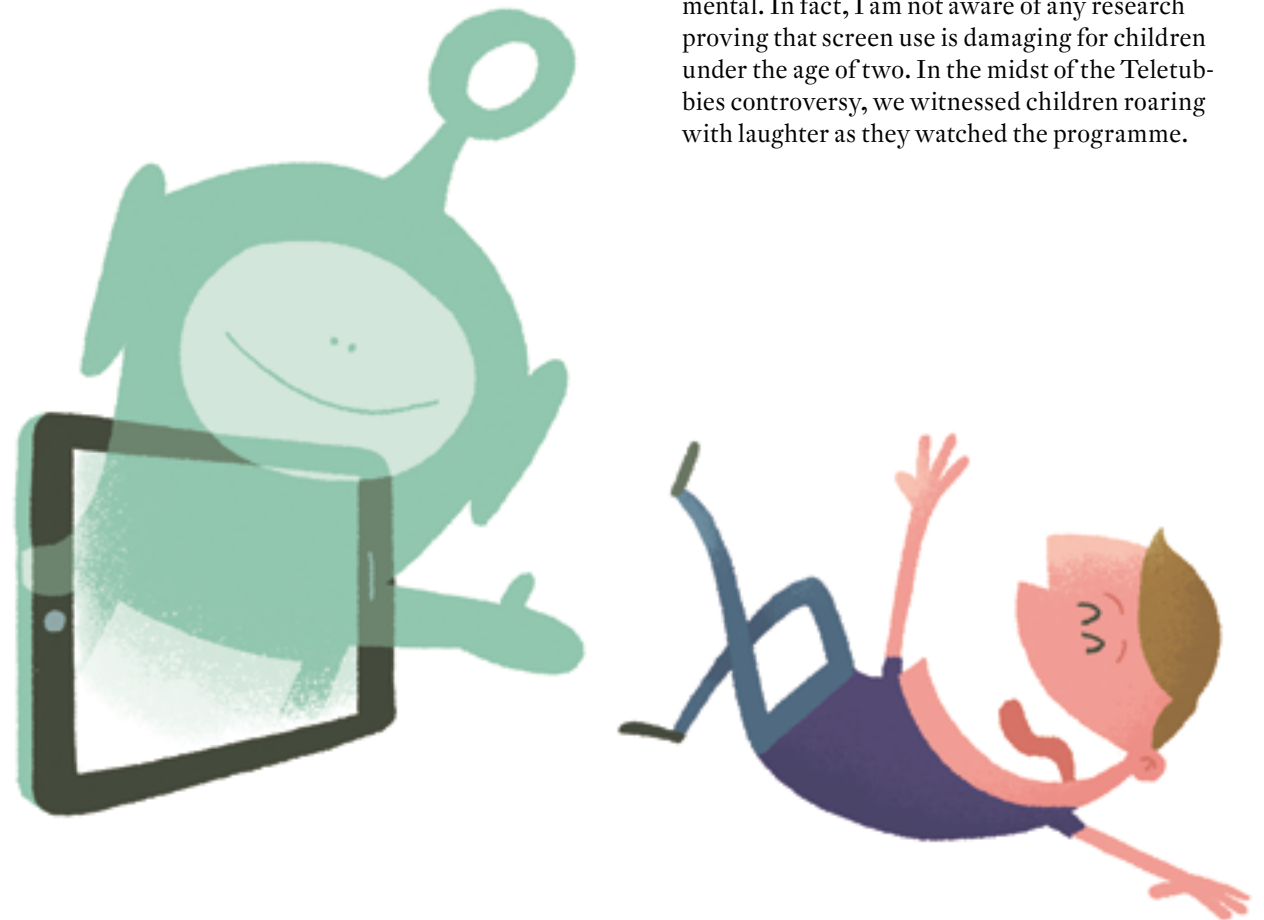
## WHY MUST EVERYTHING BE EDUCATIONAL?

**W**hat has changed in your field of expertise since you started researching *Youth and Media in 1992*?

Patti M. Valkenburg: 'In a way, one could say not much has changed. There have always been claims about the negative effects of media on young children. Those claims still exist today. In the early nineties, I did extensive research with very young children when Teletubbies came out. It was the first TV programme developed solely for such a young audience and it attracted lots of criticism from experts in the field of education who didn't feel the programme had enough educational value. We received reports from America stating that children under the age of two shouldn't be watching television. During that period I discovered that these claims were largely unsubstantiated.'

*Unsubstantiated? Could you please elaborate on that?*

'American doctors tend to make rather conservative recommendations. For instance, they claim that screen use is harmful for children under the age of two. Their conclusions are based on research showing that children learn less from a television character than from real life. So what? That does not necessarily mean media is detrimental. In fact, I am not aware of any research proving that screen use is damaging for children under the age of two. In the midst of the Teletubbies controversy, we witnessed children roaring with laughter as they watched the programme.'





## PATTI M. VALKENBURG

Distinguished University Professor of Media, Youth, and Society at the University of Amsterdam and the founder of CcaM, the Centre for Research on children, adolescents, and Media



Patti M. Valkenburg's research interests include the cognitive, emotional, and social effects of media and technologies on children and adolescents. She is particularly interested in how children and adolescents differ in their susceptibility to the effects of media. Valkenburg's work has received numerous awards. She is a fellow of the International Communication Association and an elected member of the Royal Netherlands Academy of Sciences. In 2010, she was the recipient of an Advanced Grant from the European Research Council, which is one of the highest European scientific recognitions. In 2011, she received the Spinoza award, the highest scientific award in the Netherlands.

MORE INFORMATION  
→ [www.CcaM-ascor.nl](http://www.CcaM-ascor.nl)

## HOW DO YOU MANAGE TO MAKE CHILDREN LAUGH AND HAVE FUN?

'How can you possibly oppose that as a parent? It ended up being one of the most enjoyable studies I have ever done. The entire debate on media for children was – and still is – about education. But why aren't young children allowed to enjoy themselves watching a programme developed especially for them? At that time, there was virtually no entertainment available for these very young children, so I wondered: Why do people feel this isn't permissible? Why must everything be educational? Why can't young children spend ten to fifteen minutes – without being too close to the screen, of course – laughing out loud, singing along with the songs? Up until then, this had been a rare occurrence. I actually thought it was an incredibly clever accomplishment. Teletubbies started in 1997, but the point I'm trying to make is still significant. Why do we focus so much on educational apps for children, whereas an equally important question is: How do you manage to make children laugh and have fun?'

*So, what you are actually saying is that it isn't harmful at all to let your toddler play with phones or tablets?*

'I'm saying there is no scientific evidence to back up the claims that it is detrimental. Of course you wouldn't let a small child play for too long; but at the same time, apps can arouse an enormous amount of interest in a child. That's the dilemma we're facing. And that's why I'd like to see more research done in my field. I am making plans for our own research project on the educational value of children's apps.'



## THE DEBATE IS ONGOING, YET THERE IS HARDLY ANY RESEARCH AVAILABLE

'How does one pick and choose between twenty thousand apps for children in the app store? Are the claims that the apps make actually being met? What's the difference between so-called "age-appropriate" apps and "educational" apps? The debate is ongoing, yet there is hardly any research available.'



## THERE'S A KNOWLEDGE GAP BETWEEN TEENAGERS AND PARENTS

*Why did you pick the educational value of apps developed for small children as your new focus?*  
‘My group has always followed new debates in society and the concerns of parents. Our field of expertise is dynamic and exciting; there is so much knowledge to combine from various disciplines. This allows us to take our work a step further. Fortunately, more and more people in the educational branch and in the fields of media research and communication are realising they can learn a great deal from one another. And of course, the media are always changing and developing, and so are children. Almost no social media and application we researched at the beginning of the millennium still exists, such as, for instance, ICQ, the Dutch social network site Hyves, and MSN Messenger.’

*Teenagers and their media use is another popular issue that regularly pops up in the media. Are you also researching this particular group?*  
‘We are. They make yet another interesting field of research. For them, it has become second nature to use various media at the same time. About one third of their media time is spent on media multi-tasking. Especially television in conjunction with other media. Also, they have a tremendous desire for speed and variety. Media have to be fast. We are conducting research about the effects of all this. What we have discovered so far is that the effects of social media on teenagers in particular are mainly positive. They use it as a means to test their own identities by trying out things in the area of sexuality and intimacy online. We have also discovered positive effects on their social competence, making friends, developing self-confidence and the quality of their friendships. As opposed to ten years ago, social media are now being heavily used to maintain an established network. On the

other hand, due to smartphones and other technologies being physically closer to the body, the risks of compulsive behaviour have increased.’

*What are the effects of this development?*  
‘We could conclude from our own research that six per cent of Dutch children are addicted to games and another, slightly lesser percentage show symptoms of dependency on social media. This is, in fact, precisely the same problem of dependency we can see among adults. But our children need us to teach them how to deal with this in the best possible way. However, not only are parents struggling with the issue of self-control themselves, they are also having a harder time being the gatekeepers. Families used to have one telephone in the living room; now children have their own telephone at an increasingly younger age. This does not mean, however, that parents have become careless. A great deal of discussion about this topic is going on between parents and children. There is still a knowledge gap between teenagers and parents, but an increasing number of parents are also well informed.’

*Is your field of research taken more seriously now than it was when you first started?*  
‘Most definitely. In the past, children were simply not considered to be as important as adults. Children’s books were considered inferior to adult literature, and this also held true for all other children’s products. This has completely changed. Young people are now the forerunners in most current technologies and it has become clear to everyone just how important our young people are and how much can be learned from them. They have their own money to spend, and have a great influence on their parents. And they are considered an important future market.’



*What should media producers and developers of children’s apps at least take into consideration when designing new materials?*

‘Their designs should take both cognitive and social-emotional levels of development into consideration. We know that the content children love most is made up of information which only slightly deviates from their levels of cognitive and emotional development. The Dutch Sesame Street, for example, does this in a very clever way. For a long time, the programme only focused on

Patti M. Valkenburg with her PhD students and research assistants

cognitive development, which was a consequence of the show’s having originally come from America, where it was meant to help overcome the gap in education. In the Netherlands, educational standards and levels are somewhat higher, and there is less of a gap. So now the makers are focusing more on social-emotional development.’





## YOUNG PEOPLE ARE NOW THE FORERUNNERS IN MOST CURRENT TECHNOLOGIES

*Can you give us an example?*

‘You need for instance to know the age at which children begin to deal with jealousy and self-awareness. The realisation that someone likes somebody else more than you, develops around

the age of two. If you start playing with those emotions in the app, it will have an enormous appeal for children in that specific age group. You also need to be aware of cognitive development. For toddlers, a game cannot be too fast because

## LEARNING IS MOST EFFECTIVE WHEN THERE IS COGNITIVE AND EMOTIONAL INVOLVEMENT

they will lose their focus; and once it becomes too difficult most of them will simply walk away. Another case in point is that children often end up discovering a product purely by chance. I give lectures at marketing conventions and frequently speak with entrepreneurs who have launched a successful product. In order to have your product stand out from the crowd, I believe it helps to do your homework.’

*Can researchers and designers of games and apps learn from one another?*

‘I think we can definitely help each other when it comes to creating positive content, for example, by researching and testing the cognitive effects of gaming on underprivileged children. We now know that if you include certain elements of a game in the learning situation, and design characters children can relate to, they will learn more. Learning is most effective when there is cognitive and emotional involvement. And both types of involvement can be encouraged by adding drama or specific characters. Educational games still too often lack these elements of entertainment. If you want to use apps for teaching benefits, you should have an eye for characters which appeal to your specific age and target groups. For young children, you need simple, round characters like Barney or the Teletubbies. When children are four or five, they desire more dangerous, somewhat complex characters who experience adventures. And of course, it’s not just about characters. It’s also about humour, environment, speed, and repetition.’

*What difficulties do you encounter in your research?*

‘Scientific research is always lagging behind. Drawing conclusions in research can only be done by following children over a longer period of time, and by keeping certain factors constant during that research period. The difficulty with investigating the effects of digital media is that digital media are changing so rapidly that it is almost impossible for us to conduct long-term research on the subject. We therefore must be creative. We can conduct research on how digital media is used and we can study its short-term effects. Also, we can observe the individual differences between children. Some children may experience positive effects and others negative effects while using the same media. Lumping all of those children together does not lead to the truth. We are developing a better means of conducting research on a more personalised level. In the meantime, apps and games are also becoming more personalised, which means they are getting closer to what children prefer. That development can have a great impact on them and on the learning process as a whole.’ ☒



# SHOW- CASES

**BBC**  
TESTING & HUMOUR

**PAXEL123**  
GAMING & EDUCATION

**HET KLOKHUIS**  
SCIENCE & FAMILY

**RAVENSBURGER**  
STRATEGY & INNOVATION

**HELLO RUBY**  
CROWDFUNDING & CODING

**TOCA BOCA**  
CO-CREATING & CHARACTERS



# BBC APP

EDUCATIONAL  
AND ENTERTAINING



THE MAKERS OF **CBEEBIES PLAYTIME**



## A SUCCESSFUL, NON-COMMERCIAL APPROACH

LEARNING THROUGH  
PLAYTIME

The CBeebies Playtime app has been played over 25 million times. But what's the secret of its success? And what can other developers learn from the BBC's creative yet firmly non-commercial approach?



## SHOWCASE APP: CBEEBIES



**Company:** CBeebies, Salford, UK

**Owned by:** The British Broadcasting Corporation (BBC), established 1922

**Target audience:** 0 – 6 years

**Aim:** Safe, high-quality apps which encourage learning through play

**Accolades:** The CBeebies Playtime app was nominated in the Digital Creativity category of the 2014

British Academy of Film and Television awards. Between August 2013 and October 2014, it was played over 25 million times in the UK alone.

Since launching in August 2013, the BBC's CBeebies *Playtime* app has been downloaded an enormous three million times in the UK, the only country it is available in – meaning over half of the country's under-sevens potentially have a copy of the app. Playtime's success has exceeded all expectations. And no-one has been more amazed than the team behind it.

'It's blown us away,' says Jon Howard (44), Executive Product Manager and Tech lead. 'We expected a few kids to play with it. But in the first four months of 2014, it was played over 12 million times.' 'And we got a million downloads in the first nine weeks alone,' adds Senior Editorial Producer Lizzie Leadbeater (31). And all this for the equivalent cost of less than one percent of the CBeebies TV budget.

CONTINUING A  
PROUD TRADITION

So what's the secret?

The British Broadcasting Corporation (BBC) has been producing children's content since it was first established in 1922. The CBeebies channel was created in 2002 to produce TV shows encouraging 'learning through play in a consistently safe environment for children aged six and under'. A child-friendly website accompanied the station, with activities themed to all their popular TV shows.

The development of online CBeebies content has since progressed from simple quizzes to a choice of over 500 online games based on the most popular CBeebies TV characters – making them one of the UK's leading publishers of children's games. The Playtime app reflects the BBC's 'four-screen'



strategy – tablets, mobiles, PCs, TVs – to make content as accessible as possible. ‘Our remit is now to deliver where our audience are,’ Lizzie says.

‘People watch TV and there’s a “lean forward” mentality – they want to engage with that content and feel that they are a part of it,’ Jon adds. ‘We realised that lots of people use apps, and we needed to be in that space.’

## STIMULATING SKILLS AND CREATIVITY

As a publicly funded body, the BBC is not driven by commercial concerns. Instead, a public charter clearly sets out their obligations: promote education and learning, stimulate creativity and cultural excellence, and create high quality content – which it defines as ‘original, innovative, challenging and engaging’. Lizzie says these principles drove the development of the Playtime app. ‘We knew the audience had high expectations of us,’ she says. ‘We’re very conscious of our responsibilities to the public,’ Jon agrees. ‘These are our ingrained values.’

At first, Playtime included just four games, based on the TV shows Octonauts, Tree Fu Tom, Something Special and the Alphablocks. ‘These are our most channel-defining brands, the ones that really showcase what CBeebies is all about,’ Lizzie says. As demand grew, it increased to eight by June 2014. Each game is designed to nurture

a different key skill – including literacy, fine motor controls and movement skills, teamwork, and an understanding of nature.

The app aims to cover most of the UK government’s Early Years Foundation Stage, which sets out seven key areas of learning for the under-sevens. These include communication and language; understanding the world; physical development; personal, social and emotional development; literacy; mathematics; and being creative.

‘We wanted to make sure we weren’t just covering the same areas as the online games – we needed to cover each of those learning areas,’ Lizzie adds. ‘They are now woven into everything we do.’

The design and development stage started in the middle of 2012, with a series of workshops between Senior Designer Leanne Dougan (29), Jon, Lizzie, and the BBC’s Bristol-based technical partners, Mobile Pie.

## TESTING, TESTING AND MORE TESTING

Once the number of games had been decided upon and the mission statement was finalised – ‘We made sure we were all happy with it, and referred back to it during each and every stage,’ explains Jon – the team set about testing their ideas.

‘We wanted to investigate what gestures came naturally to children and whether they could use device features, such as the tilt. Doing this research early on meant we could offer a more immersive experience,’ Leanne explains. ‘Could they swipe from left to right? From what age can they handle a swipe functionality – or is a tap better? And must we get the app to work for both?’ Lizzie adds. ‘We basically had to assume we knew nothing – in effect we tested from scratch. We built a lot of very early prototypes to test different kinds of mechanics, like the accelerometer (how fast characters travelled through



# DO'S & DON'TS

BY THE CBEEBIES TEAM

### DO

- Get to know your audience: How do they use touch screen devices? What excites and engages them? How and when do they engage with content on these devices?
- Test your ideas with your audience as often as you can.
- Test with prototypes as early as possible to justify your idea or concept.

### DON'T

- Don't make any assumptions, test everything – none of us creating content for children are the target audience.
- Don't be afraid to adapt or completely change your idea based on your findings.
- Don't lose sight of your vision: write a vision statement and refer back to it regularly.

## WE GOT THE USERS TO GENERATE IDEAS AS WELL



## THE CBEEBIES PLAYTIME TEAM

### THE MAKERS



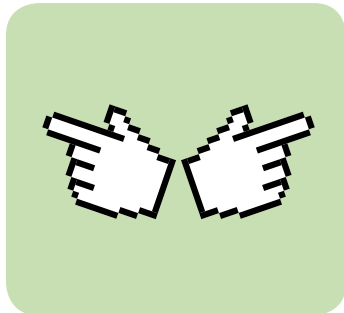
Executive Product Manager  
**JON HOWARD**, 44

**Children:** Yes, two daughters (9 and 12)

**Favourite app for kids:**

[Minecraft Pocket Edition](#)

**Would like to see:** A digital creative experience that has a very low entry barrier, is simple to use but allows young people to build actual products of quality such as games and apps that can be published and shared.



Senior Designer  
**LEANNE DOUGAN**, 29

**Children:** No

**Favourite app for kids:**

[Petting Zoo](#)



Senior Editorial Producer  
**LIZZIE LEADBEATER**, 31

**Children:** No (but I have 7 nieces and nephews that keep me busy)

**Favourite app for kids:**

[Endless Alphabet](#), [Endless Reader](#) and [Endless Numbers](#)

**Would like to see:** Beneficial learning activities wrapped up into fun, engaging, family experiences.



## ALSO FOCUS ON CHILDREN WHO MAY NOT HAVE ACCESS TO TECHNOLOGY

## WE TESTED FROM SCRATCH

games) and the camera.’ This kind of testing not only helped shape the way the game looks, but also helped balance the pace, and ensured it was rewarding enough.

As the app has no voice-over instructions, another challenge was to create navigation buttons which have a strong visual meaning. ‘Communicating navigation without any words whatsoever is always a challenge,’ Lizzie says. Testing showed that children have a strong attachment to their favourite TV characters. They decided to create a rotating wheel mechanic, illustrated with the characters from the beginning of the app – or hub, as it was known – because it was easily scalable and the children found it fun.

Children’s input resulted in several changes. Prototypes for the Octonauts game had a character controlled by noise, yet the team thought there should be an option for children who don’t want to call out. ‘But the children were definitely not afraid to shout, even in a quiet room. They all shouted straight away,’ Lizzie says. Adds Leanne, ‘We got the users to generate ideas as well: What’s familiar to them? What would they like to see in the CBeebies app? Not to forget the parents – what do they expect from a CBeebies app?’

Prototypes also helped in deciding which size buttons were needed for small hands. ‘We tested that through a game in which a character popped up in a square, while children had to try tapping it as it got smaller and smaller,’ Lizzie explains. The resulting ‘heat map’ recorded children’s hand movements on the screen, so designers could see how accurate they’d been, and which icon size would be successful.

Early testing was held during relaxed ‘stepping out sessions’ in schools, nurseries, playgroups,

## TOP TIPS FOR SPECIAL NEEDS APPS

BY CBEEBIES SENIOR EDITORIAL PRODUCER LIZZIE LEADBEATER

### 1 Rewarding Games

Create simple but rewarding games designed to support the motor skills required to operate assistive technology, and teach cause and effect;

### 2 Main Character

Have the main character lead wherever possible, as engagement is difficult to obtain and maintain in children with profound cognitive impairment;

### 3 Use of Speech

Back up facial expressions by speech, e.g. ‘Mr Tumble is sad’, ‘Mr Tumble is happy’;

### 4 Use of Sounds

Use a range of different and engaging sounds – but none that are too startling;

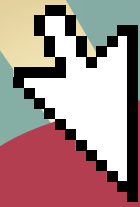
### 5 Reward at the End

Save a secondary reward for the end screen, but keep this short and directly related to the gameplay.

and toddler groups or the CBeebies ‘digiden’, a colourful, brightly decorated room in their MediaCity complex, while formal testing was done in their lab. The team ensured that a range of ages, skills and abilities were covered.

‘It’s also important to focus on children who may not have access to technology, to see how differently they would use the app, as well as children from different cultures, and with different competencies,’ Lizzie advises. Drawing-based activities, coloured post-it notes, and questions with different smiley faces were used to record children’s responses quickly and methodically.





# TEN STEPS OF GOOD TESTING

BY THE CBEEBIES PLAYTIME TEAM



TESTING & HUMOUR

**1 Put the child at ease.** Don't tower over them; come down to their level by kneeling, or sitting on a chair. Let them know the goal is to help you discover what can be improved, that their opinion is very important to you and there is no right or wrong answer. You are testing the design and interaction, not them.

**2 Choose your words carefully when explaining a task.** Try not to direct the child by using the same terminology as the design.

**5 Keep an eye on their body language.** Children can't always be relied upon to verbally articulate their thoughts or feelings. This will provide clues as to how they're coping with the tasks. Are they smiling, fidgeting, sighing or groaning?

**6 Try testing each design phase with a different set of children,** as repeated exposure breeds familiarity, which in turn leads to false positives.

**7 Use words that match the child's vocabulary,** such as 'buttons' instead of 'interface'. Remember, the 0 to 6 age group is very literal, suggestible, and has a short attention span.

**8 Ask simple questions.** This age group does not yet understand depersonalised or indirect questions. Good questions to ask a child are, 'Tell me about the last time you...' 'Why? How? What do you think will happen when?' 'Can you show me how to...?' 'That's interesting, can you tell me more about that?'

**9 Always test in pairs, consisting of a facilitator and note taker.** The facilitator's role is to engage the child and ask the questions, whereas the note taker's job is to collect evidence of any recurring issues.

**4 Ask the child if they think something is good, bad or in the middle.** This simple rating system will allow them to easily talk about their experience. Follow up a 'bad' or 'middle' response with a probing question like: 'That's interesting, how could we make this better?'

**3 Resist the urge to gesture or provide hints.** By keeping quiet, observing and taking plenty of notes at every misstep along the way, you are gathering valuable insights which will ultimately help you improve your design.

**10 Categorise your observations.** Create a sheet with your list of tasks as the section headings, then write your observations for each child under these headings. Your report could have these insights divided into 'what worked well', 'what didn't work' and 'recommendations' sections.



## IF YOU CAN'T AFFORD RESEARCH, ASK THE BBC

Tests for children with special needs were specifically designed by experts. Specialist testers went into children's homes, and gave their parents the app in advance so they could try it out first.

Lizzie is keen to point out that you don't need to be a big corporation to test effectively. 'Approach schools for help with testing your app; many are happy for companies to test with their pupils, and often use the experience as a reward. Even small companies can go out and test with users again and again, in order to really understand them and their needs. If you know how children play with apps and use these devices, then your content will be better.'

And if you can't afford your own research? Ask the BBC. 'Because of our publicly funded nature, it's in our interests to share information and make sure that the rest of the industry is being supported by us,' Lizzie says.

## CREATING A PERSONAL EXPERIENCE

The look and feel that the team wanted to create was simple, bright and colourful, whilst maintaining the strong identity of the CBeebies TV characters. But it was also important to make the app look unique, with an element of surprise. Thus it is filled with 'magical moments'. For instance, a train unexpectedly runs through the games, whilst in the evening a special night time mode uses the device clock to transform the environ-

ment into a magical night sky. An further upgrade gives graphics a snow-covered, festive feel during Christmas.

Personalisation was also important. Designers wanted each child to feel as if they have their own unique Playtime app. Creating a profile was one way to do this; but a big challenge was how to make that work. Testing soon revealed that under-sevens were just too young to get the idea. 'Even the word "profile" doesn't really gel with kids,' Jon says. 'We had to come up with a way to give each child a personalised experience – one which wouldn't be too complicated or boring for them to fill out.'

A hot air balloon concept was developed, with a personalised balloon which carries users in and out of the CBeebies world. Another innovation are the bugs – game rewards which come in different shapes and sizes. 'We showed children some different bugs, and asked them which they liked. We then used some of their drawings,' Jon says. 'You can decide which bug you want to keep so your world and your profile is very much your choice,' Lizzie explains. 'It gives users a sense of achievement.'

## BALANCING HUMOUR

But, as Jon says, not everything had to be about learning. 'Pure entertainment is also important,' he says. 'After all, one of the educational foundations of the app is 'social development.' Adds Lizzie, 'In everything we design we have to balance humour against educational value.' Although she admits it was a challenge to inject humour into the app, slapstick visual comedy has proved particularly popular among four- to five-year-olds. An example is the Swashbuckle game. 'We came up with some pirate jokes, but when we took them to testing there was just silence,' Lizzie explains. 'They don't get wordplay or juxtaposition. Their humour is more custard pies in the face and smelly socks, literal things.' Says Leanne, 'A good way to tell whether something

## IT'S NEVER TOO LATE TO CHANGE

is funny is by looking at children's body language. You can tell by their facial expressions whether or not they think it's funny.'

## KEEPING IT SIMPLE

Surprisingly, the most popular Playtime game has been the simplest of all – the Something Special game, featuring TV clown Mr Tumble. Aimed at children with delayed learning and communication difficulties, the Something Special programme is produced by a former teacher of children with special needs. The name derives from the idea that all children are special.

In the app, Mr Tumble and his family try on different clothes, with players popping bubbles to splash colour onto the outfits. An educational consultant created a user flow which enables children with limited mobility to use just one switch or button to successfully pop the bubble. 'We made the game simple and rewarding – so even children with quite extreme needs can have a really positive experience,' Jon says. 'Parents and carers can also set the options so the bubbles can be popped with an audio prompt. It's got a really creative element, and we've had reports of kids younger than one playing it.'

It's precisely this feel-good, emotional factor which really motivates children of all abilities to engage with Mr Tumble. 'Particularly for the special education audiences, that's the incentive to play,' says Lizzie.

The unique qualities of a touch-screen device offer huge possibilities for different abilities. Playtime

also helps dyspraxic learners control their movements with an orb they can tilt or tap. 'We felt it was really important to have dual control mechanisms, and when fans are told that the game is mainly aimed at dyspraxics, it blows their mind,' Jon explains. 'It's very easy to wrap these things up in a compelling experience for everyone.'

## PLAYING WITH USABILITY

The BBC's marketing and audience departments fed in data about how people use the CBeebies site – and for how long. 'We learned there was no point in making things that lasted half an hour, as the average playtime is less than ten minutes. This really steered our thinking – it was like somebody turned a light on,' Jon says.

Since the app was launched, data has continued to be analysed. The discovery that Playtime is mainly played between 6 to 7pm led to the development of the night time mode, which begins at 6pm, reflecting the start of the CBeebies TV channel's 'bedtime hour' as well as a child's environment and daily routine. 'We understand that routine is particularly important to young children, and parents use Playtime as a reward,' Lizzie says. 'Details like that were really useful to help us understand what content is appropriate.'

In addition, continual testing on children with special education needs has led the team to incorporate even more visual prompts, particularly for those children with hearing difficulties, and also to introduce a greater variety of control settings for a wider range of abilities. 'If an idea's not working as you'd hoped it might be, then do some more user testing and find out what will work better,' Lizzie says. 'It's never too late to change.'

Based on data about which device people use CBeebies on, Unity, a multi-platform publishing tool, was chosen for Playtime. Although Unity





## CHILDREN LIKE RECORDING THEIR OWN VOICE

creates large file sizes, the team considered it the best option, as it also gave the team more time to create prototypes and do further testing. ‘Our main impetus was delivering a really high quality experience for mobiles and tablets, and Unity allowed us to do just that,’ Jon says. ‘If we’d had to build specifically for each platform it would have taken us four times as long.’

## CENSORING AND PARENTAL INPUT

Playtime has what Jon calls a ‘walled garden approach’, which limits the risk of children navigating away from the app toward unsuitable content. A grown-ups information section, separate from the children’s space, can be accessed only by pressing and holding a text button – something which proves too difficult for a young audience. And whenever the user is taken outside of the app, grown-ups are asked to enter a key code.

‘There’s an educational fact about each of the games in the grown-up section, as we thought it would be nice for parents to engage with their children’s experience via the app as well,’ Lizzie explains.

There is also an option to record and send your child a special message – another one of the rewards built into the app – or choose one voiced by a CBeebies character, one of the ways in which the app maintains a closeness to the original TV characters. ‘It’s fun for adults. We know our audience must have been extremely well behaved as the

Special Message has been sent over 535,000 times since August last year,’ Jon laughs. ‘A few parents were saying that their five- and six-year-olds know how to get into the grown-up section and leave messages for themselves. They quite like recording their own voice and then hearing it back.’

## INVOLVING DESIGNERS

The CBeebies team’s collaboration with designers Mobile Pie, Jon says, ‘made the agency part of the BBC family’. The agency attended many of the testing sessions to see first-hand how their app was working, and improve their ability to create the quality content Jon, Lizzie and Leanne were after. ‘Involving Mobile Pie from the beginning really helped them buy into the vision of the app. It was quite a quick turnaround – seven months – but they were as proud of it as we were,’ he adds.

Richard Wilson from Mobile Pie agrees. ‘In my mind the key to the success of the project was the constant communication between Mobile Pie and CBeebies. This let us be as agile as possible during development, with feedback and user testing results integrated close to the delivery date.’

CBeebies also worked with special educational needs experts, who helped design the testing methods for autistic and special needs children, as well as for the Something Special game.

Although the app’s focus is ‘learning through play’, Jon says the team avoided trying to meet the demands of the school curriculum. ‘The curriculum is constantly changing – if we had linked it to Playtime, by the time it’d been launched and it would have been dated.’ Yet despite this, the app is now regularly used by teachers as an educational tool. Some parents have even written in to tell the Playtime team that the app has helped their children learn to read. ‘It wasn’t our objective, but it has certainly been used that way,’ Lizzie says. ‘It’s had a much bigger effect than I imagined it would,’ Jon adds. Just one of the many unexpected successes of Playtime. ☒

## HOW TO MAKE KIDS SMILE?

# LAUGHTER & APPS

**While making *Playtime*, the CBeebies team realised that pure entertainment is also an important value of a good app. Jacqueline Harding, child development expert and director of Tomorrow's Child – a children's research and film production company – explains the essence of humour for children. What makes them laugh?**



**JACQUELINE HARDING** set up Tomorrow's Child following a successful career as BBC education editor, government consultant, head teacher, and author of best selling books for children and adults.

Tomorrow's Child is a research and film company specialising in children. They are frequently asked to conduct media research using a specially designed methodological tool.

What we all know that there's nothing quite like a good laugh and what's more...it's known to help relieve stress and tension. Apparently, having a bellyaching laugh triggers the release of endorphins. In short, it makes us all feel better. So, if humour is important for our wellbeing then there's no doubt it should be considered as important to include in children's media diet. Children like to share a good joke with their friends and family and will laugh even if they are not entirely sure of what is truly funny. Laughing is a social activity, so little ones very quickly learn that humour has its own pay-off. When it comes to producing content for media devices, it is important to be aware of the developmental way in which children 'grow' in the laughter stakes.

### Developmental Progress

At around 2-3 years of age, children are very tied to the here and now and the joke needs to be immediately obvious and not too reliant on abstract thought. For example, calling a cow a sheep will bring the house down. Once they reach 4 years of age, they expect a bit more in terms of humour. Try adding a 'baa' sound when the cow appears, for example, or placing a fluffy white 'sheep-looking coat' on the cow. But remember the child is laughing because it appears/looks hilarious not because they truly understand the incongruity or lack of logic. Around 7 years of age, they are ready for some serious humour! Try adding some double meanings in terms of language, as they can now hold the tension and 'get the joke'.

### First Rule

When developing content for other countries, it is important to know that humour can be culturally related. First rule of thumb: Do not cause offence! So, do your homework first and ensure the joke is transnational if necessary.

### So, how do you make children laugh?

The starting point is always 'know your audience' and don't assume that because as an adult you find

something side-splittingly funny, that a 4-year-old will find it equally amusing. Secondly, once you have scripted out the narrative or journey, test and re-test. Be aware that children generally like to please adults, so the 'researcher effect' must be taken into account. Independent research is the most effective way of ensuring that the work is presented to the children in an unbiased fashion.

### What works?

Take a good look around at what is working in terms of humour. Analyse why it works; watch children playing with successful apps. How do they respond? What makes them giggle? A good place to start is an analysis of the *Something Special* game – featuring TV clown Mr Tumble – which highlights the 'fun factor' for young children. The app is visually powerful and utilises simple humour. Most importantly, the app is usable and doesn't interfere with the humour (it's certainly no use making them laugh if the usability breaks the concentration).

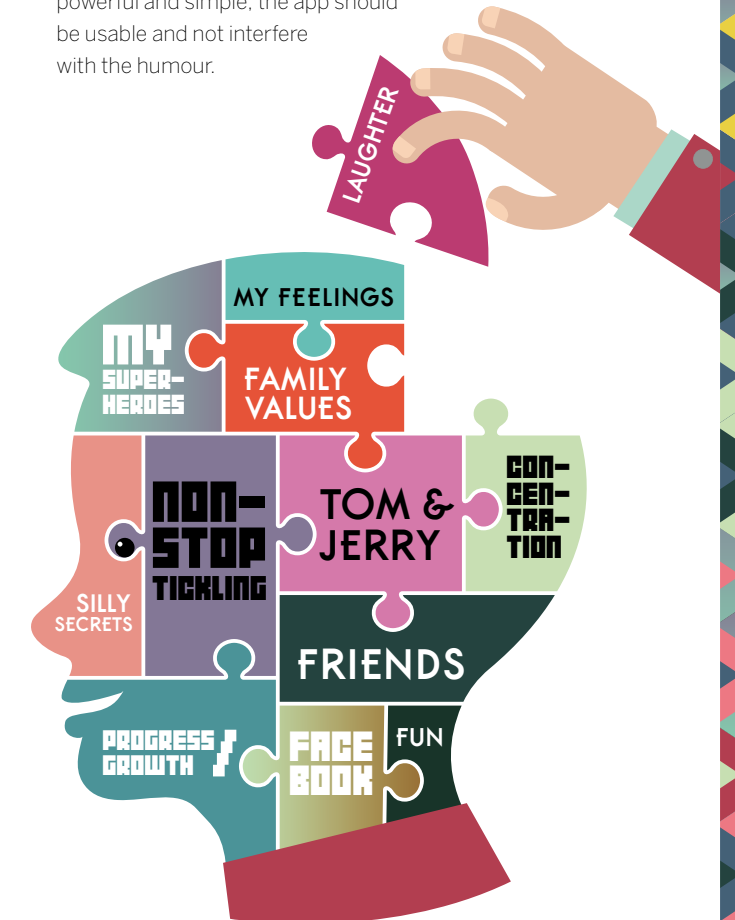
### Does the platform or media matter in terms of humour?

The simple answer is: not really, as developmentally their humour will remain the same irrespective of platform. The basic rule of thumb for all media is the younger the child, the more visually obvious the humour must become.

## TOP TIPS

# HUMOUR

- 1. Do not underestimate its value.** Humour is important for our wellbeing.
- 2. Be aware of children's development.** The younger the child, the more visually obvious the humour must be.
- 3. Do not cause offence!** Humour can be culturally related.
- 4. Know your audience.** Find out what works at what age.
- 5. Test and re-test.** Independent research is the most effective, presented to the children in an unbiased fashion.
- 6. Keep it simple and visual.** Humour should be visually powerful and simple; the app should be usable and not interfere with the humour.





# PLAY & LEARN



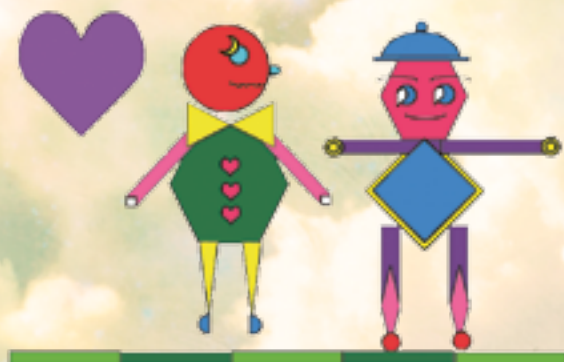
TEACHER ANNA MARGRÉT ÓLAFSDÓTTIR



MADE BY A TEACHER, TESTED BY KIDS

# EDUCATIONAL GAMES

Twenty years as a preschool teacher in Reykjavik taught Anna Margrét Ólafsdóttir one thing: when it comes to learning, kids just need to have fun. Now she designs computer games for youngsters based on that premise. Her mission? Fun, free educational games for all.



## SHOWCASE WEBSITE: PAXEL123



**Product:** [Paxel123.com](http://Paxel123.com)

– a non-profit website offering free educational games.

**Created by:** Anna Margrét Ólafsdóttir, head of an Icelandic preschool.

**Aim:** To stimulate mathematics skills and language literacy in young chil-

dren through play, in a safe and free online environment.

**Languages:** Currently available in nine languages, including the Nordic languages, Polish and English.

**Target Group:** Children aged 4 to 8. Also suitable for second language

learning and children with special needs.

**Unique:** Much of the material has been tested by children.

**Extra:** The website also offers numerous printable worksheets.

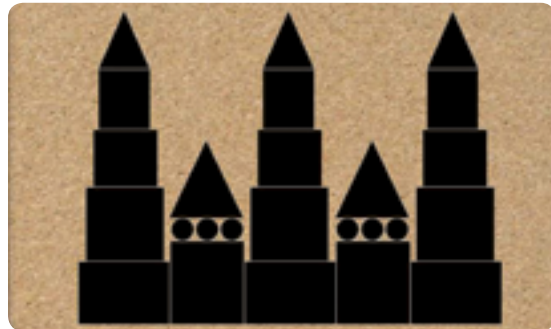
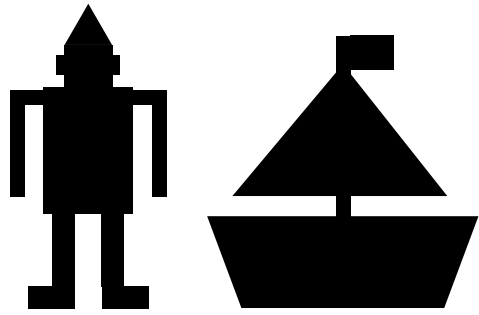
### STEP 1 INITIAL INSPIRATION

Good ideas often don't just appear out of thin air. Many are born from a specific need. This is also the case for *Paxel123*, a games website founded by Icelandic teacher Anna Margrét Ólafsdóttir (54). She noticed a lack of educational material for teaching mathematics and language skills to young children in a fun manner. 'Children as young as three and four already have a natural interest in these subjects,' she says. Having spent a large part of her adult life surrounded by kids, she knows what she is talking about. The mother of three and grandmother of five has worked at a preschool for 20 years, spending 13 of those years as a head teacher.

Eager to make the most of children's early inquisitiveness, she decided to create her own games for the kids in her class based on extensive research by prominent education experts. Why games? 'Everyone knows that kids learn through play,' she says. She started off with a series of board games. The kids learned a great deal – numbers, shapes, letters – the lot. What she didn't foresee at the time was how popular her games would prove to be both with the kids and the teaching staff: 'I was so surprised to find out that some of the games I had made back in 2000 were still being used ten years on.'

Anna Margrét attributes this enduring appeal, in part, to the relatively loose rules of the games, which leave enough scope for new and creative ways to play them. The children can decide for themselves, for example, whether the first one





The game Magic Shape Pictures

to cross the finish line wins, or whether the winner is the player with the most points. Also, little adult supervision is needed, so children can play the games on their own. 'You can see that they are concentrating, interacting and having fun,' she says, adding that they pick the games whenever they are free to choose their own activity.

### GOING ONLINE

That got her thinking. How could she help more children to enjoy her games in order to stimulate effective early learning? She toyed with the idea of making more board games. Then, in a classic 'eureka'

## SPECIAL NEEDS & SECOND LANGUAGE LEARNING

Anna Margrét explains that her games are especially good for children with learning problems. She has had a lot of positive feedback from teachers and parents of children with special needs, including those with speech impediments, due to the focus on rhyming and words in certain games. The *Pattern Puzzle Game* Pad app has



received great reviews on a few special-needs websites for introducing the concepts of repetition and shape as well as promoting patience, eye-hand coordination and fine motor skills. Because the games are provided in several different languages, they are also suitable for second language learning. In Anna Margrét's experience, kids like trying out the games in different languages just for fun. 'One group at an Icelandic primary school wanted to play a game in Swedish. By lunchtime they were ordering hot dogs in the school canteen in Swedish.'

moment, the answer came to her one evening in the bath. 'I realised that if I really wanted to reach more kids, I could turn the board games into computer games,' she says. And she set about doing just that, despite having little knowledge of computers,





## IPAD LAUNCH

# THE PATTERN PUZZLE GAME

The Pattern Puzzle Game is the first Paxel123 game developed for the iPad, recently joined by a second game, Magic Shape Pictures. An additional iPad game is now in the pipeline, soon bringing the total to three.

**Ages:** Four and up, but some kids as young as two can already enjoy the easiest level.

**Skills:** Fine motor skills and shape/pattern/colour recognition.

### How does it work?

The challenge is to drag differently shaped coloured blocks into a grid to recreate an image that is identical to the original.

### Levels

There are four levels of difficulty and ten images that can be made in each level.



## AND THE WINNER IS...



Anna Margrét Ólafsdóttir's hard work was recently officially recognised with an award from the European Commission for 'Best Content for Kids 2013' in the 'Adult, Non-Professional' category. 'My son is very proud of me, but at the same time he thinks it's quite funny that I ended up getting an award for a website and computer games despite the fact that I'm not good with computers.' She remains surprised by the website's success. Before the award, about 30,000 games were played every month. That figure has since doubled. She remains dedicated to developing quality digital content for children and is a member of POSCON, a European network that supports 'Positive Online Content and Services for Children'.

## LOTS OF GAMES ARE MADE BY PEOPLE WHO DON'T HAVE A BACKGROUND IN CHILDREN'S EDUCATION

let alone computer games. She never saw that as an obstacle, however: 'Lots of computer games are created by people who are good at making computer games, but don't have a background in children's education and interests. I have that background. I know how children develop, but I'm not good at designing computer games, so I find people who can help me,' she says. When it comes to the end result, she figures that it's better to do it that way around, because then the material is grounded in a solid educational base.

### STEP 2 THE CONCEPT

Anna Margrét may not be a professional games developer, yet she has a clear central vision that defines every Paxel123 game. Her aim? 'To stimulate literacy in mathematics and language in a safe (and free) Internet environment.' It sounds deceptively straightforward at first, but it's actually rather an ambitious mission. So how does she set about achieving that?

When it comes to designing games, the teacher's advice is to focus on children's interests. Research and her own experience have shown time and again that if kids are interested, they'll learn automatically. 'They want to know how to write their names and the names of their friends – use that!' Anna Margrét says. Another example she gives is of how children see shapes in everyday things, from houses to traffic lights and toys. This idea forms the basis for Paxel123's 'Shape People'

game, which invites children to use different shapes to make pictures. 'My grandson is two and can already name all of the shapes,' she says.

### DESIGN DETAILS

The look and feel of Paxel123 games is very similar to the original board games made by Anna Margrét Ólafsdóttir. The pictures are simple and colourful. Each game features different skill levels. The teacher stresses that this is a key factor in determining the success of educational games with kids. If a game is too easy, children get bored, but if it's too hard, they are quick to lose interest and give up. The trick, she explains, is to make sure that you can keep challenging kids. 'Always offer them something that is a little above what they can already do.'

Another important aspect when designing games for kids is to bear their physical abilities in mind. If a game demands very intricate or fast movements with a mouse, young children won't be able to play it, even if they want to. It may seem obvious, but according to Anna Margrét, many computer games developed for kids aren't made with enough respect and consideration for children and their abilities. Numerous existing games don't challenge children to think at all and tend to overload kids with too many rules or too much stimulus in general.

That is why the Icelandic teacher is so passionate about offering quality: games that stimulate creativity and teach skills such as counting, classifying, pairing, building from blocks or identifying shapes or colours. 'A game that requires you



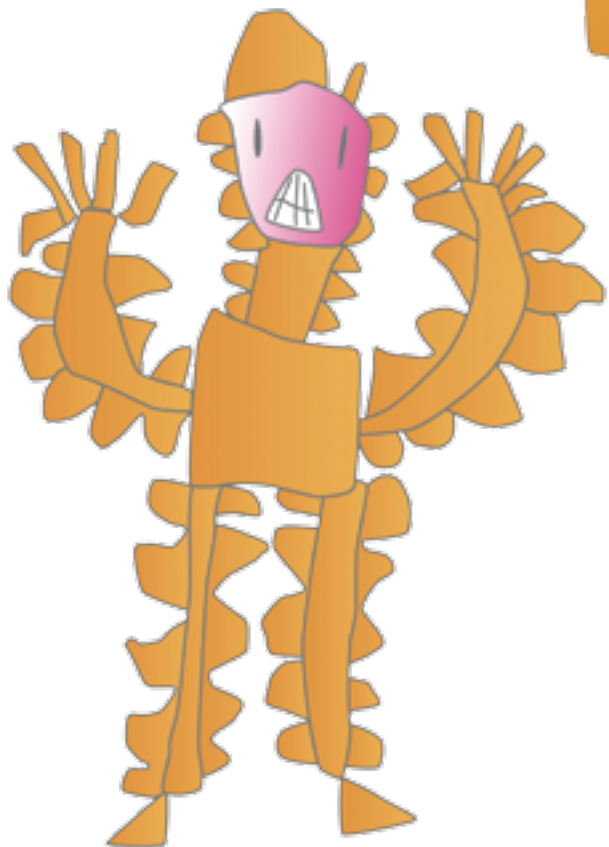
CHARACTERS



Ziza



Steinar Máni



Elisa



Helga Nína



Krummi



The original children's drawings and the actual characters of the game Get Shapes



## IF A GAME IS TOO EASY, CHILDREN GET BORED

to choose whether to dress a paper doll in a pink or red does not strengthen a skill or foster understanding,' she says, although she acknowledges that such games are fine now and then.

When it comes to respecting children's needs, creating a 'safe and free' online environment is vital. 'Pop-up ads are not good for kids. I've even seen free sites aimed at children with totally inappropriate ads,' Anna Margrét says. And so she stands firm in her decision to offer quality without making use of fees, data collection or ads of any kind. 'The site is all free, and non-profit. I don't think many existing websites offer that.'

### STEP 3 TESTING, TESTING

One of the great benefits of being surrounded by children is that you can immediately test your ideas to see how they go down with the target audience. Anna Margrét got the kids at her school and other schools to test the first three games while they were being developed. The games were then adapted based on the children's feedback.

When Anna Margrét's son was still young, she also used to test her board games on him. In fact, she named the website after him as a thank-you. His name is Pétur Axel and his nickname is Paxel. Her son is now 18, so these days she turns to her grandchildren for advice. They have been the 'beta-users' for the ten newest digital games.

## TOP TIPS GAME DESIGN FOR YOUNG CHILDREN

- 1 Must be fun**  
Kids learn while playing.
- 2 Simple, colourful pictures**  
Don't make visuals too complicated.
- 3 Different levels**  
Kids lose interest when a game is too easy or hard.
- 4 Avoid too many rules**  
Keep the game straightforward and easy to understand.
- 5 Ask kids for ideas**  
They have lots of ideas; why not use them?
- 6 Add a reward at the end**  
Fireworks are a sure winner – kids are nuts about them!

So, what type of feedback did the kids come up with? Apart from some basic colour and design tweaks, surprisingly, the biggest request was to add a reward at the end of each game. Not just any reward: they specifically wanted fireworks! As a result, now two of the games – Hide and Seek and the Shape Puzzle – end with visuals of fireworks on the screen.

Anna Margrét also worked with a group of six five-year-olds from her preschool to create a new game called 'Get Shapes'. The characters featured in the game were drawn by the kids themselves and include a cheery-looking green creature with a giant blue hump and blue toes,



The game Hide and Seek



The original board games





and an orange square man sprouting two strands of thick blond hair in a middle parting. You can choose which figure you want to appear on screen as a reward for clicking on the correct shapes.

Anna Margrét highly recommends using kids in the design process. ‘They have great ideas and it’s really easy to incorporate those ideas into games,’ she says. It makes sense: surely the best way to tap into what kids like is to go ahead and ask them!

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## STEP 4 MONEY

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Developing any new product requires money, especially if you have to hire in extra help or expertise. ‘I needed money to pay for programmers, translators and designers,’ says Anna Margrét. There are grants available, so it is worth investing the time to do research and apply for funding from the relevant parties. The process is time-consuming and can be somewhat demoralising: ‘For every yes, I’d get maybe three no’s – so don’t be put off by a few rejections.’ Her persistence paid off. Nordplus, the Icelandic Preschool Teacher’s Union and the Reykjavik City Council provided funding, among others. The grants enabled her to offer her games in nine languages (the Nordic languages, Greenlandic and Faroese, plus English and Polish). Her dream is to get her games translated into more European languages. Funding remains a problem: ‘The biggest challenge is to make games on such a tight budget. It’s always more work than you think.’ She hopes to use her growing European network to source suitable new grants and programmes.

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## HER DREAM IS TO GET HER GAMES TRANSLATED INTO MORE EUROPEAN LANGUAGES

Not all of the money comes from outside. As well as investing many nights, weekends and holidays in the project, Anna Margrét taps into her personal savings. She recently had to buy a code to solve a security problem with Java. ‘It cost a lot of money and I had to pay for it myself,’ she says. But it’s something that she is prepared to do because she truly believes in her mission to make quality educational material accessible to all: ‘Helping kids to improve in mathematics and language is my guiding light.’

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## STEP 5 THE RIGHT PEOPLE

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Crucial to Poxel123’s success has been the enthusiasm and dedication of the team involved, with people prepared to charge less money than they could, and willing to do a lot of extra, unpaid work. Anna Margrét found most of the team herself. The drawings were made by a mother whom she knew from her preschool. That mother knew a few programmers; another friend is a designer, and some of the translating is done by friends. Her son-in-law happens to be a software engineer, so he programmed the last ten games. ‘Because of that, I now have 13 games, instead of the eight or nine that I had money for,’ she says.

Students are another useful resource. Anna Margrét recently arranged for students from a Copenhagen technical college to help program one of her games. They were willing to work for a reduced rate in exchange for valuable work experience. She now plans to approach other local colleges to see if she can enlist more students.

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## KIDS HAVE GREAT IDEAS, ASK THEIR ADVICE

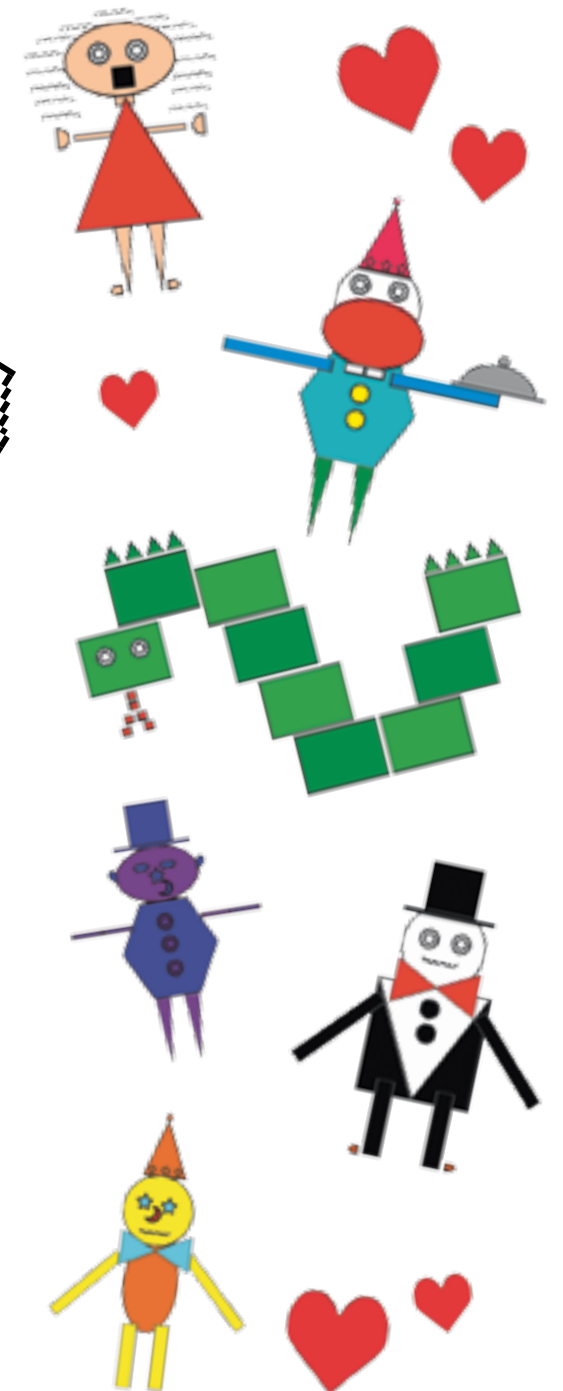
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## STEP 6 STAY ON THE BALL

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Balancing a full-time job and developing Poxel123 on the side was not easy. During the first three-and-a-half years, Anna Margrét spent 20 to 30 hours a week – on top of her regular working schedule – to get the games and website up and running. Although the challenges are less intense now, Poxel123 still requires daily attention to keep things going smoothly. There are schools to present content to, emails to answer and grants to research. Moreover, in a substantial addition to her ‘to do’ list, the Icelandic teacher recently decided to venture into the world of tablet apps. Why? Many games on the existing Poxel123 website use Flash, making them unsuitable for use on an iPad. If all goes well, the app sales can hopefully generate an income to maintain the website and perhaps provide some extra money to develop new games in more languages.

Talking to Anna Margrét, it is clear that what drives the project forward is a tremendous determination fuelled by a genuine desire to reach out to as many children as possible, regardless of their background or financial means. As for her, developing Poxel123 has also proved to be a big learning curve. Her biggest lesson? ‘Follow your dream and don’t give up. If you believe in what you do, the ball will start rolling.’ ☒



The game Shape People



# EXPLORING SCIENCE WITH AN APP

THE CLIENT **HET KLOKHUIS**

THE EXECUTIVE PRODUCER **FONK AGENCY**



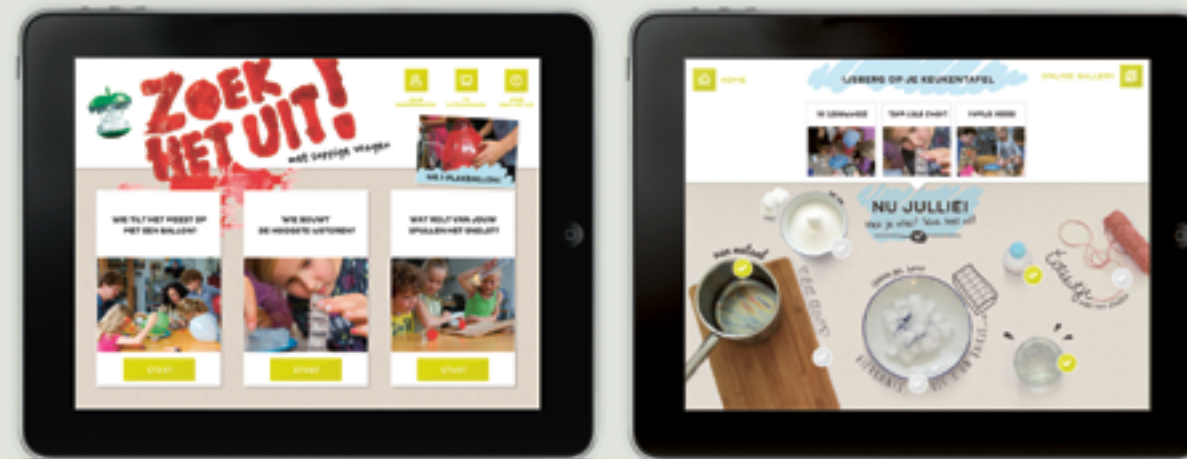


## STIMULATING SOCIAL INTERACTION WITHIN THE FAMILY

## CREATING AN APP FOR KIDS IN 8 STEPS

The Dutch television programme Het Klokhuis and the Fonk agency worked intensively together to create the app Explore it! Learning about science with the whole family has never been so easy and so much fun. The makers talk about how they went from concept to final product.

## SHOWCASE APP: EXPLORE IT! DUTCH: ZOEK HET UIT!



**Product:** The app [Explore it!](#)

**Part of:** A cross-media science project by Het Klokhuis. In a series of 10 television episodes, you find out how scientists work, and what doing research is all about. In the book, you read more about how to conduct your own

research, and with the app Explore it! you and your family experience how to do it by carrying out experiments at the kitchen table.

**What is it?** Explore it! is an app that enables families to carry out experiments themselves, using ordinary

household objects. The experiments are based on Juicy Questions that everybody in the family thinks up, investigates and answers together. The app plays a guiding role, providing tips and facts about scientific principles as well as being a logbook, among other things through the use of a camera. Users can enter their photos of the experiments in a contest.

**The Brief:** To accompany the TV series Explore it!, create a digital product that encourages kids to develop a scientific attitude.

**Objective of the App:** Exploring science together with your family.

**Client:** Het Klokhuis

**Executive Producer:** Fonk

**Target Group:** Children from 8 to 12 and all other family members.

[Explore it!](#) ([zoekhetuit.hetklokhuis.nl](http://zoekhetuit.hetklokhuis.nl)) can be downloaded for free and is available for Apple and Android.

## STEP 1 THE CONCEPT

‘P’ling!’ Such a moment of revelation never came to the makers of the app *Explore it!* when they were developing the concept. It actually evolved very gradually. Says Anneke Dorsman from Het Klokhuis, “Television is very good for showing things you normally wouldn’t see – for example, scientists conducting research on coral off the island of Curaçao. We especially wanted the online product for this project to be personal and active: How can you make scientific enquiries yourself? We spoke with Juliette Walma van der Molen from the University of Twente in Enschede, who has done a lot of research on science education. She said that little experiments are exciting and magical, but they

# ZOEK HET UIT!



## HET KLOKHUIS TEAM

### THE CLIENT



New Media Strategist  
**ANNEKE DORSMAN**, 39

**Children:** Three sons (11, 9 and 6)

**Favourite app for kids:**

[Minecraft](#), [Toca Boca](#) series and the [Camera app](#)

**Would like to see:** Technology being used to redesign the real world. New technologies always excite me because they immediately give me ideas about how to improve things.



**TECHNOLOGY  
BEING USED TO  
REDESIGN THE  
REAL WORLD**



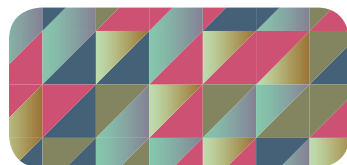
Strategist & Creative Director  
**ASTRID POOT**, 43

**Children:** Yes, a son, 5 and a daughter, 8

**Favourite app for kids:**

[Toca Boca Hair Salon Me](#), [Easy Studio](#) and [Minecraft](#)

**Would like to see:** Us getting better and better at putting tablets to really good use – not by making variations of games that already exist, but by creating something that is essentially new and valuable.



Chief Editor  
**LOES WORMMEESTER**, 58

**Children:** Yes, four (21, 23, 28, 31)

**Favourite app for kids:** [Explore it!](#)

**Dreams of:** An app that cleans my house and takes care of my financial administration.



Science Editor  
**EDDA HEINSMAN**, 31

**Children:** No

**Favourite app for kids:**

For everyone: [Google Sky Map](#) and [stargazing apps](#).

For children: [dierenzoeker.nl](#)

**Would like to see:** An app that kids can use to actually make things themselves (in other words, not only to do research).

## IT SHOWED THAT PARENTS DON'T REALLY KNOW HOW TO PLAY WITH THEIR CHILDREN

are a kind of conjuring trick; you do not learn much from them. It's better to encourage kids to develop a scientific attitude, so that they learn how to ask good questions and have the feeling that they can investigate things by themselves.'

Astrid Poot from Het Klokhuis adds, 'That made us realise we shouldn't make a game, but an app that makes it easy to do research in the real world. You see, we don't believe you can learn something simply by diving into an iPad. We would rather connect it to the real world. But what would an app that lets kids ask the questions be like?' Explains Anneke, 'Then fortunately I saw a presentation by Josh Gutwill from the Exploratorium science centre in San Francisco. Gutwill and his colleagues are conducting extensive research into how to encourage visitors to experiment with exhibitions without the presence of a tour guide. They thought up a concept that teaches people to ask "juicy questions". It turned out to be very successful. The most wonderful thing about this concept is that it is very simple and can be directly applied. Not only that, you can use it all the time in everyday life. The idea that we would be able to teach families how to think this way was a huge source of inspiration for us. The objective became bigger and more permanent than just having fun playing.'

### ASKING JUICY QUESTIONS

Juicy Questions thus became the core of the project. 'The question "Does God exist?" is a wonderful question,' says Anneke, 'but it's not

a Juicy Question, because you cannot work out the answer yourself with things you have at hand. However, "What happens when you throw a lump of sugar in the coffee?" is a Juicy Question, because you can immediately try it out. That is also what was difficult about this concept, because you can offer hardly any suggestions if you want kids to come up with questions themselves.' *Ikea's Playreport*, a research paper on games published in 2010, was also an important source of inspiration,' says Astrid. 'It showed that parents don't really know how to play with their children, even though 73% of the kids said that playing with their parents was more fun than watching TV. That's another thing we wanted to achieve with this app: stimulate kids to play with others.' Anneke adds, 'We knew fairly quickly that it had to be something you could do sitting around

## ABOUT THE CLIENT TV PROGRAMME FOR CHILDREN

**What is Het Klokhuis?** A Dutch TV programme for children from 8 to 12, produced by public broadcasters NTR, that focuses on the world around us. An episode can be about a serious matter such as child-abuse, litter on the streets or an historical event, but things like peanut butter, the sewer system and mummies also come up. Educational information is alternated with comical sketches about an episode's main theme.

**First broadcast?** January 1988.

**Achievement:** For 25 years, Het Klokhuis has been a hugely popular programme that enjoys stable ratings of roughly 300,000 viewers per episode (approximately 700,000 children between the ages of 8 and 12 live in the Netherlands). Many parents like to watch it with their children. Het Klokhuis has a trophy cabinet that is chockfull, seeing as the programme wins one or more important awards every year.

[hetklokhuis.nl](http://hetklokhuis.nl)



# INSPIRE FAMILIES TO LEARN ABOUT SCIENCE AT THE KITCHEN TABLE

the table, so that both kids and parents could be involved. An iPad has a camera, so it's fantastic as a logbook. You can write something on it, take photos and put it down again while you're talking or busy.'

## STEP 2 STARTING POINT & METHOD OF WORKING

The starting point was clear: inspire families to learn about science at the kitchen table using Juicy Questions. They approached the Fonk agency to act as their producer. 'As soon as Anneke and I handed them the brief, it became a collaborative process,' says Astrid. 'Fonk is specialised in interactive design and technology, so those things are more their responsibility, although we did work together on the interactive design.' Says Niels de Keizer from Fonk, 'Astrid and Anneke came to us with a clear starting point, but how do you incorporate such a concept into an app? We had to figure that out ourselves. Sometimes you know beforehand what direction a project will take, or what factors you will need to consider, but here everything was blank.'

### A CUSTOMISED PRODUCT

Anneke compares the way they constructed this app to architecture: 'You have companies that construct apps in the same way that some housing developers construct houses from a catalogue. This was like building a customised house, and you don't get that out of a catalogue. A lot

of time went into thinking and talking about the project. With this app, the interactive design is closely interwoven with the concept. If you are going to teach children to ask Juicy Questions, that pretty much depends upon how you do it – with the "how" being the interactive design. We did that together with Sabina, from Fonk. She translated the concept into concrete displays.' Once a week, Het Klokhuis and Fonk discussed what had been accomplished, what still had to be done and what point they were at in the project. Says Niels, 'We worked according to the Scrum Method: you reduce the size of the processes and deliver little parts each week – short sprints, as it were, that you make as a team.'

### ABOUT THE EXECUTIVE PRODUCER

## DIGITAL, INNOVATIVE SOLUTIONS

#### What sort of agency is Fonk?

An agency specialised in conceiving and developing digital and innovative solutions. Fonk has big international clients, but also works for startups and launches digital products of its own. The agency has an office in Amsterdam and another in Cape Town.

#### What have they made before this?

Fonk is known for being innovative, so they attract clients who want out-of-the-ordinary applications. For Royal Jumbo, Fonk created the iPawn, a physical pawn that allows users to interact with a touch screen. They also co-realised *Maily*, the first email client for kids aged 4-8. Fonk is now working on the *WeTransfer* app.

**Specialised in:** Innovative, solid and exciting applications for touch screen devices like smart phones, tablets, touch tables and touch walls.

**Aim:** Making the world a better place by creating applications that add value and entertain their customers on a daily basis.

[fonkmobile.nl](http://fonkmobile.nl)

## THE FONK AGENCY TEAM

### THE EXECUTIVE PRODUCER



Partner / Creatively & Technically Responsible for End Product

**NIELS DE KEIZER**, 39

**Children:** Yes, a daughter (1½)

#### Favourite app for kids:

[Toca Boca](#) and [Little Fox Music Box](#)

#### Apps made before this:

WeTransfer, ING Famegame, Jumbo iPawn, Maily, Fixico, E&Y Taxlaw app, KRO Paul's Popduel, Quest Master, to name a few.

#### Would like to see:

Something relevant added to people's lives in the form of digital products. Interactive Design,

Design

**OSKAR SMITH**, 23

**Children:** No

#### Favourite app for kids:

Oy Mexico

#### App made before this:

Fixico

**Would like to see:** Gaming.



Paper Prototyping

**SABINA VAN KATWIJK**, 29

**Children:** No

#### Favourite app for kids:

[The Fantastic Flying Books of Mr. Morris Lessmore](#)

#### Apps made before this:

Catch The Mouse, Paul's Popduel, Quest Master  
**Would like to see:** Apps that people use a lot because they make them happy and fill a need in their daily lives.



Technical Chief

**WOUTER STEIDL**, 38

**Children:** No

#### Favourite app for kids:

[Artistico](#)

#### App made before this:

Jumbo Puzzle App

#### Dreams of:

Developing and making the most fantastic concept ever.



Creative

Technologist

**BEN GROOT**, 26

**Children:** No

#### Favourite app for kids:

[Maily](#)

#### Apps made before this:

FameGame, E&Y, Grolsch, WeTransfer

**Dreams of:** Developing the coolest apps of all.

APPS THAT PEOPLE USE A LOT BECAUSE THEY MAKE THEM HAPPY



Lead Developer

**WOUTER HUIZINGA**, 34

**Children:** Yes

#### Favourite app for kids:

Too many to choose just one.

#### Apps made before this:

Jumbo Puzzle App, Quest Quizz, RabRadio Quizz, Dolfje Weerwolfje, Jumbo

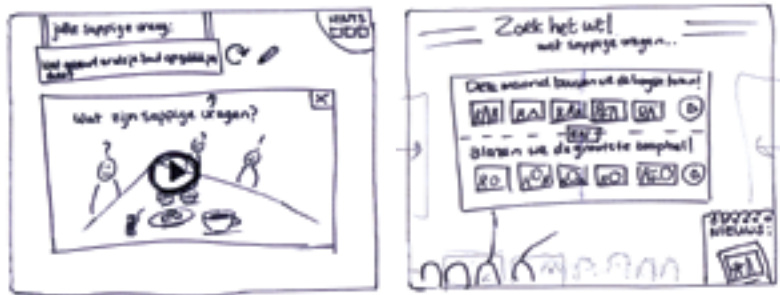
#### iPieces:

Game of Goose / Pool / Mens erger je niet / Snakes and Ladders / Fishing

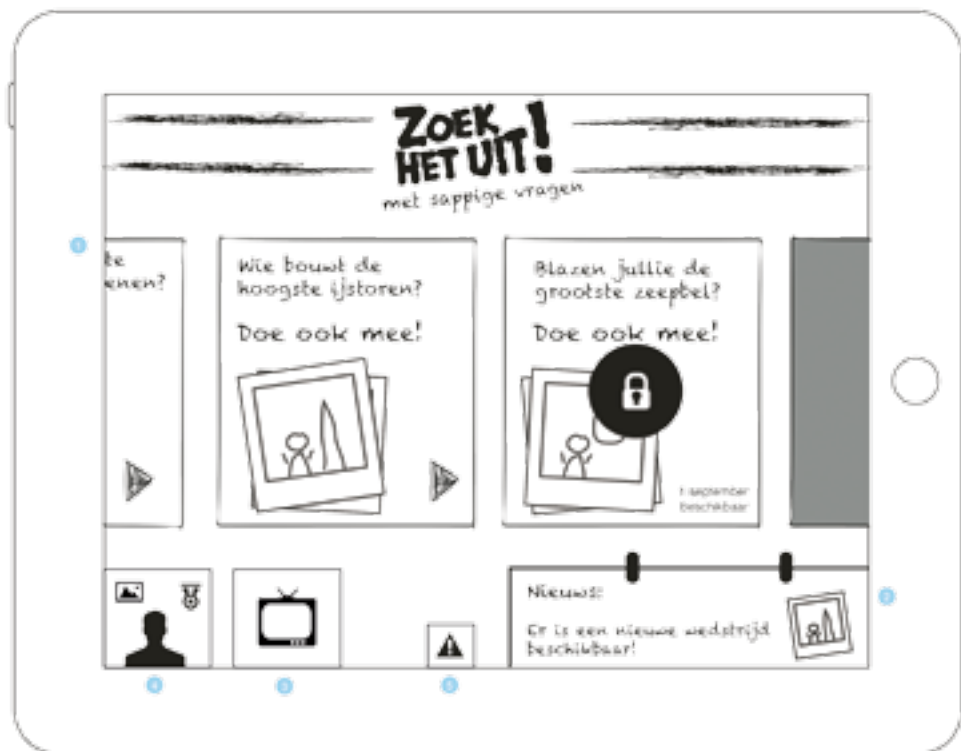
**Would like to see:** Self-funded & conceptualised games, not client-driven work.



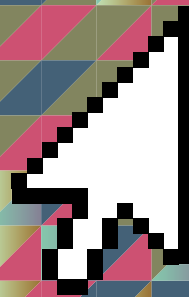
## SHOWCASE



Sketching is a step in the development that you must not skip



Example from the definitive sketch version of the interactive design



## STEP 3 PROTOTYPING

Translating the concept into an app was done by making a paper prototype. Het Klokhuis had already collected a few conceptual experiments, such as building a tower out of ice cubes. ‘Once the idea was there, working it out went smoothly,’ says Niels. ‘We depicted the flow of the app on A4s. You draw a display in which you do something, then you draw the next display and so on.’ According to Niels, this is a step in the development that you must not skip. ‘It is best to work as quickly as possible toward something you can test. On paper or digitally. Thinking up an interactive design is fun, but it shouldn’t take too long. Otherwise, you are only spending time thinking and not doing. If you can test something, you get feedback from the users and that’s important.’ Anneke from Het Klokhuis also thinks that a paper prototype is a useful way of testing the principle of the app. ‘Even if it’s just some sketches on a couple of pages, you can quickly find out whether the users understand what the intention is.’

## STEP 4 TESTING

The app was tested at every stage: not just during the early stages, but also throughout its development. Anneke and Astrid presented each new design or idea to the target group. ‘In the beginning I was also curious whether I could explain the concept of Juicy Questions to my own children in two minutes,’ says Anneke. ‘And it worked, because they immediately started asking the right questions. And to check the look and feel of it, I took a few designs to my children’s school. They didn’t voice any criticisms. That was a great test, because children can be rather harsh in their judgment.’ The paper prototype was extensively tested with families. ‘During a testing stage, you quickly get a feeling for what works and what doesn’t. This has nothing to do with the colour of a button or whatever. It’s about the use of the app. If three people

## KEEP IT AS SIMPLE AS POSSIBLE

do something wrong, then you know you have to change something,’ says Astrid. Niels also thinks that this is a good approach. ‘The better you test, the easier you can construct the app later on. After the testing was done, we could move ahead quickly with the interactive design.’

## STEP 5 INTERACTIVE DESIGN

After the family tests, Sabina from Fonk made a definitive version of the interactive design, which establishes the flow of the app. She worked out various user scenarios. The original concept included three separate parts: a version in which users were provided with a number of Juicy Questions, a blank version in which users could discover literally everything themselves, and a possibility that included a contest. After testing, a decision was made to incorporate all of these versions into a single flow. ‘The app should not disturb the user too much while they are experimenting, which is why we wanted to keep it as simple as possible,’ says Niels. ‘Three different access points would have made it unnecessarily complex.’

## STEP 6 DESIGNING

The displays for the final design were worked out on the basis of the interactive design. ‘A great part of the designing was done at Fonk, but we also contributed,’ says Astrid. ‘Photography, for example, is an important part of the app. Our science editor collected the objects you need in order to do the experiments, Fonk made the composition, but then we all stood around the table while the photographs were being shot. One person would

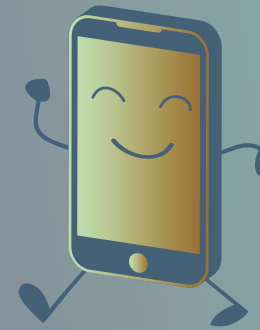




Sketch version of 'Juicy Questions'

# DO'S & DON'TS

FOR KIDS FROM 8 TO 12



- 1 Choose your colour palette carefully. Kids often associate too many primary colours with pre-schoolers.
- 2 No gender distinctions, so don't make everything blue or pink.
- 3 Use images purposefully. Kids like images but also expect them to be functional. Make sure your images support your objective instead of distracting from it.
- 4 Little children require special buttons but that's not necessary for kids above 10, because this target group already has plenty of Internet experience and is used to certain conventions. A search bar should simply look like a search bar.
- 5 Kids want to know how the world works and want to be addressed seriously.



## PLEASE DO TRY THIS AT HOME



### THESE ARE EXPERIMENTS THAT KIDS CAN DO WITH EXPLORE IT!

- pasting without glue
- iceberg on the kitchen table
- rolling and rolling
- stacking up liquids
- swinging shoes
- super juice
- making wind
- bizarre balance
- musical notes
- foam
- water tension
- flowing water



# 5 GOLDEN RULES WHEN DEVELOPING DIGITAL PRODUCTS FOR KIDS



**1 Know your target group.** Make your product for and also with kids. Today's children are born with an iPad and don't know anything different. How can we possibly imagine what that experience is like? So you have to ask them.

**2 Picture how the kids will be playing** with the app and what it should bring about.

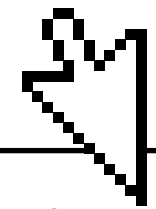
**3 Keep talking with the target group** for your product and especially talk about how it will be used. Involve them in what you are doing and try things out.

**4 Get feedback from the client.** It is important that the client personally has an influence on what is being made. This kind of collaboration produces the best results: the (creative) ownership of a product does not lie with the agency, but is in the hands of the client, or both.

**5 Put love into everything you do,** from the construction of the app to the final design. It has to look extremely good, maybe even better and more beautiful than a product for adults.



## THEY ALL KEPT AN EYE ON THE DIFFERENT PROCESSES



### STEP 1 CONSTRUCTING

pay attention to the colours; another would make sure that the content was correct.' At first, this was something that Niels had to get used to: 'Normally, we work very much from our own inspiration and do a lot for the clients. Het Klokhuis has a language and image of its own, however, and Astrid and Anneke had a clear picture of what Het Klokhuis is and what things had to look like. We struggled with that in our first designs. In the end, we added an extra designer to our team. Sometimes we had to search for the best way of working together.'

After the design phase, the developers started working on the construction of the app. 'A number of developers worked on this project,' says Niels, 'and Wouter coordinated that.' Even though everybody had separate tasks within the project, they all kept an eye on the different processes. Sabina, for instance, who was responsible for usability, also checked out the design, and the designer looked at whether the usability worked. 'The technical people joined the project later,' Anneke says, 'and before they got started, we built a tower out of ice with them. At first it seemed like that wasn't really necessary to do, but it was good for everyone to experience how much fun it is to work with this.'

## SOURCES OF INSPIRATION

- *Playreport*, large research initiated by Ikea in 2010 on games, based on 11,000 interviews with 8000 parents and 3000 children from the ages of 7 to 12. View the video: [stmko.nl/play](http://stmko.nl/play) and the full report: [stmko.nl/playreport](http://stmko.nl/playreport).
- Exploratorium in San Francisco, ([www.exploratorium.edu](http://www.exploratorium.edu)) and its publications [stmko.nl/exploratorium](http://stmko.nl/exploratorium).
- The functionality of [youtube.com](http://youtube.com) and [evernote.com](http://evernote.com).
- Today's platform for kids: [diy.org](http://diy.org).

### STEP 2 LAUNCHING

The app was launched in 2013 during Cinekid, a media festival for children. Episodes of the TV series *Explore it!* (*Zoek het uit!*) were broadcast on Dutch public television from October to December in 2013. The app, the book and the television series were launched simultaneously. After each episode, a promo clip for the app was shown on TV. 'That resulted in a lot of downloads,' says Astrid. 'We also promoted the app during the Weekend of Science organised by the Dutch National Centre of Science and Technology and launched different sets of experiments at different times, so that we could keep generating attention through social media.' ☒





THE RAVENSBURGER PHILOSOPHY:  
**ENJOYMENT,  
EDUCATION  
& TOGETHER-  
NESS**

MANAGING DIRECTOR **THOMAS BLEYER**



## RAVENSBURGER DIGITAL AND THEIR HYBRID GAMES

# THE MASTERMINDS BEHIND THE MICROMINDS

Ravensburger. The name conjures up old TV ads featuring a happy family of four playing a board game in the kitchen, having some good old-fashioned fun. But while the fun is still very much a part of it, Ravensburger Digital is far from old-fashioned. In fact, the company is developing highly innovative hybrid games. Managing Director Thomas Bleyer explains how a traditional family company can become a dynamic 21st century digital game producer.

## SHOWCASE: HYBRID GAMES



**Company:** Ravensburger Digital, Munich, Germany

**Owned by:** Ravensburger AG (the original company was founded in 1883)

**Number of Apps:** over 50

**Age Range of Target Audience:** 2-99  
**Aim:** To create exciting new digital and hybrid games, while staying true to Ravensburger's core values of enjoyment, education and togetherness.

**Accolades:** Ravensburger Digital has won a number of awards, including the German Computer Games Award, the German Children's Software Award and nominations for various Developer Awards.

## BLUE TRIANGLE

Everybody knows the blue triangle of the Ravensburger brand. Most people will also know that Ravensburger is a German company. But few people will realise that the brand name actually derives from the company's birthplace, the picturesque town of Ravensburg in upper Swabia. In 1883, in this border town with an illustrious trading past, Otto Maier founded a publishing house that would turn out to have an illustrious future. Less than a year after founding Ravensburger, he published his first game. Otto Maier had a protestant work ethic, an international outlook and was passionate about music, painting and education. The second and third generations of Maiers (both with subsequent Otto's) built up the company in the international, hardworking but fun-loving spirit of the first Otto.

Nowadays, Ravensburger – which only became a corporation in the 1980s – sells about 8000 different products worldwide, has 1700 employees and an annual turnover of 359 million euros. It is Europe's largest maker of puzzles, Germany's number one traditional games publisher and also a leading publisher of children's books. The Maier family is still a presence on the board and the brand philosophy, as represented by the three sides of the blue triangle, is still based on enjoyment, education and togetherness – just as it was over a hundred years ago.

In 1993, the company was split into three divisions: 'games, puzzles, arts & crafts', 'books' and 'leisure and promotions'. And in 2009, a whole new subsidiary was added: Ravensburger Digital, based in Munich, with a mandate to explore the opportunities of digital media for the Ravensburger brand.



# FOOD HAS TO TASTE GOOD AND GAMES HAVE TO BE FUN

## MANDATORY PLAY

Thomas Bleyer (42), the managing director of Ravensburger Digital, has an office full of toys and games, including video games and board games. Yes, playing during working hours is allowed; in fact, it is mandatory. 'You have to play all the time – for inspiration and to know the market.' It is the only way to stay innovative, which is something the digital division has been from the very start, when it was among the first traditional publishers to offer apps in the iTunes store. Ravensburger started out in the digital world by converting two favourite physical products into apps: the children's game classic, memory®, and a brain-trainer called 'Think'. From the beginning, Ravensburger Digital has had very clear views on how to use technology. Says Thomas, 'You mustn't use technology simply for technology's sake – otherwise it's just a gadget. Technical features have to add something to the experience without distorting it; they have to be a natural extension of the game. Such as being able to use your own photos when playing memory®. That really adds something new to the experience.'



With new features such as that built into them, those first two apps became immensely popular. 'With that first generation of digital products, we saw that the brand was received very positively by consumers and platform owners alike,' says Thomas. 'That gave the company the confidence to start developing completely new games just for digital platforms, since there were also a number of very successful products out there that had no physical product brand to start with.' Nowadays, Ravensburger Digital has over 50 apps on iOS and Android, and a small number of browser and Facebook properties. Some digital products have even spawned physical products of their own. Ravensburger's book division has recently published a children's book based on *Karl's Castle*, a popular app for younger kids.

## HYBRID FUTURE

But Ravensburger wasn't satisfied with just having physical and digital products. The company wanted to go cross-category and make a hybrid product. 'We all love digital games,' says Thomas, 'but that does not mean we no longer like to play in a physical context. We believe that playing in a real world context is a unique experience. We want to provide the benefits of the digital platform on the one hand, but we most definitely want to give the players of a game a real world experience too. It adds up. We believe people will value that very much.'



# MICRO MINDS

**Hybrid Game:** *Die verrückten Experimente der Microminds* (The Crazy Experiments of Microminds)

**Digital Component:** smartphone or tablet and app

**Age:** 7+ **Number of Players:** 1 or 2

**Skills:** mental skills, appropriate reactive skills, knowledge of physics and chemistry

**Game Time:** 6 hours

**Unique Aspects:** visual recognition software specially developed for Ravensburger; the app that comes with the game is free; the phone moves over the game in a holder

### How does it work?

The Microminds, funny little aliens, have crash-landed on earth and need help with repairing their spaceship in order to get back to their planet. The children conduct all sorts of chemical and physics experiments while trying to repair the spaceship. Ultimately, they have to answer the question, 'Where do Microminds come from?' The phone or tablet acts as a magic lens that lets the players look into the interior of the spaceship. Children play by reacting appropriately to situations on the spaceship. They do this by placing cards featuring the correct elements for experiments on the proper location on the board. The card will display a solution to a problem – for instance, a Bunsen burner. Through visual recognition, the digital component identifies the played card. For each card/experiment combination, a fun animation featuring the chaotic little aliens has been built in.





# THE RAVENSBURGER RULES



**1** Play and analyse as many games as you can.

**2** Embrace technology.

**3** Don't use technology for technology's sake – only use it when it adds value.

**4** On a strategic level: be forward-thinking, dare to invest.

**5** On an operational level: don't operate on gut feeling, do your research.

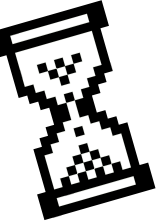
**6** Take changes in society into account.

**7** Keep it simple: a product for younger children should not have too many different elements.

**8** Test and test again until it feels good.



## YOUR SMARTPHONE IS A MAGNIFYING GLASS LOOKING INTO A NEW WORLD



This idea has actually been floating around the company for a while. Ravensburger started making hybrid products even before the digital division was active. In 2008, they published a board game using electronics, *Wer War's (Whoowasit)*, in which an interactive game master gives audio output. It has a co-operative game mechanism: the players either all lose together or all win together. *Wer War's* was named Children's Game of the Year 2008 and became the kickoff for a very successful product line.

Ravensburger recognised early on that it is uniquely suited for developing hybrid games, since it is one of the few companies in the world boasting in-house experience on both the physical and digital sides. Few companies can combine their relatively long experience in developing digital toys and apps with their profound knowledge of publishing books for children and developing board games, toys and jigsaw puzzles.

### NEW PROJECTS, NEW TEAMS

Starting the digital division in 2010 was a conscious strategic decision to capitalise on this unique potential by looking into ways of combining the traditional Ravensburger expertise with new technological developments. The unit consists of approximately 25 extremely dedicated people, all working in a semi-open space office crammed full of games. When people work together on a project, they use various segments of the office and change the seating to create their

own space for that particular project, designing it just the way they want. 'The walls will be full of white-boards and sketches and images,' says Thomas. When a project is over, new teams will be formed around new projects. Thomas's philosophy is that not always sitting in the same chair and working with different people is good for creativity. Ravensburger's traditional business unit has its own innovation unit too, which, says Thomas, has always been open to new technologies. It's not surprising, then, that all three divisions of Ravensburger – traditional games, books and digital – work closely together in creating new products across categories.

### FORWARD-THINKING FAMILY

Probably the main reason for Ravensburger's success in developing innovative products, ventures Thomas, is that its culture is different from other traditional toy companies, which tend to be rather conservative. Ravensburger, however, has always been forward-thinking, there has been a willingness to try new things, take risks. Otto Maier's spirit is very much alive. 'As a family-owned business, it has always taken the long-term view,' explains Thomas. 'We were already active in electronic games and PC games over twenty years ago, for example.'

Another big investment, one that paid off, was *tiptoi*<sup>®</sup>, a hybrid product line launched in 2011. It is basically a stylus with a small, self-contained memory unit and a USB connection, a simple



## HYBRID GAME SYSTEM

# SMARTPLAY

- **Digital Component:** smartphone and app
- **Unique Aspect:** visual recognition software specially developed for Ravensburger

### → How does it work?

SmartPlay is Ravensburger's new system for hybrid board games. You buy a starter set which includes a first board game and the smartphone holder and can buy additional games separately. The app that comes with the game is free. The phone hangs over the game in a holder and serves

## THE FIRST THREE

# SMARTPLAY GAMES

### → Game: YES or KNOW

- **Age:** 8+ → **Number of Players:** 1-6
- **Skills:** age-appropriate general knowledge
- **How does it work?** The built-in quiz master offers ten different kinds of quizzes and adapts the questions to the age and preferences of the players.



as an interactive game master: it explains the rules (often a hurdle when playing for the first time), reacts to players using specially developed visual recognition software, and provides music and sounds to create an extended play experience.

### → Game: King Arthur

- **Age:** 8+ → **Number of Players:** 1-4
- **Skills:** adventure
- **How does it work?** The players are knights roaming England in medieval times. They battle each other in tournaments, with the phone acting as game master and referee.

### → Game: The Magic Museum

- **Age:** 8+ → **Number of Players:** 1-4
- **Skills:** co-operation
- **How does it work?** The players have to work together to catch an escaped dog whilst escaping a T-rex themselves. SmartPlay makes the museum in which this takes place come alive at night.

## THE IDEA IS THAT TECHNOLOGY CHANGES A LOT

## CREATING A SUCCESSFUL GAME IS NOT ONLY ABOUT TALENT AND CREATIVITY

device that gives puzzles, books and games an interactive component – or as Ravensburger itself says, ‘brings them alive’. When you touch the surface of a board game or book, you hear a voice that will guide you through it. Or you might hear appropriate animals sounds in a picture book. Tiptoi® can tell stories or give commands like a game master. There is a whole range of tiptoi® products for children between the ages of 4 and 10.

opened up the market, demonstrating that it was possible to connect physical toys such as hybrid characters to a digital world.

At that point, it was time for Ravensburger – and many other companies – to branch out in that direction. But Thomas stresses that Ravensburger would never copy anybody else; it was simply the next step in the company's own game development evolution. ‘But Skylanders has definitely changed things,’ says Thomas. ‘Now we get a lot more interesting proposals from computer games developers, who were not aware of the vast potential offered by the physical components of the Ravensburger brand before they had seen a product like Skylanders.’

## PORTAL OF POWER

Hybrid products can be approached from two sides. The basic, core experience can be the physical product, which is then enhanced by digital components, such as with tiptoi®. But it can also work the other way around, when the starting point of the game is the screen experience, which is then further enhanced by physical components. Think of a video app that recognises actual figurines.

A well-known example is a series of console video games developed by Activision, the world's largest video games publisher, in 2011: Skylanders. The actual adventure takes place on the screen but you need figurines with different attributes to play it. The figurines interact with the game via the ‘Portal of Power’, a ‘pedestal used to transport the Skylanders, who are frozen as toys in our world, into the game’. Skylanders has grossed over 2 billion since its launch and sold 175 million toys, making it one of the top 20 most successful franchises ever. The series has been widely praised, mainly for its innovative use of the Portal of Power. Its success really

## EMBRACE TECHNOLOGY

Which is great news, since Ravensburger's philosophy for moving forward is ‘Embrace technology’. In fact, Ravensburger actively woos the computer game developing community, alerting them to the vast potential awaiting them in Ravensburg. The idea is that technology changes a lot, so it's important to attract people with the latest knowledge in that area, whereas one can easily become familiar with the fundamentals of game design, since they don't change as much. ‘Though game design has come a long way in the last thirty years, the answers to questions like “What makes a fun game experience?”, “How do you create a game that people come back to?” and “How do you create player satisfaction?” are still fundamentally the same,’ says Thomas. Because at the end of the





## 4 STEPS TOWARD CHANGE

What changes should a traditional company make in order to adapt to the 21st century? Ravensburger's Thomas Bleyer identifies four steps:

- 1** Make innovation a strategic effort within the organisation, with its own dedicated processes, projects and resources.
- 2** Give yourself the necessary freedom to experiment.
- 3** Test your products thoroughly.
- 4** Put them on the market; learn from that and adapt your products quickly.

STRATEGY &  
INNOVATION



## HOW TO BECOME SUCCESSFUL?

So, you have developed a wonderful product. How do you make sure it catches the world's eye? Ravensburger has these three tips:

- Dare to do something new, so it's a story worth being told.
- Develop a crystal-clear product positioning that everyone can understand.
- Spend as much time thinking about marketing as you do thinking about your new game.

day, he stresses, consumers just want a valuable entertainment experience. The way you deliver it is secondary. The technology behind it doesn't matter to people. And that is Ravensburger's secret: it uses technology to bring the game-playing experience to a whole new, previously unimaginable level. When you combine the best of both worlds, not even the sky is the limit!

'Most game makers love trying to come up with something new – in fact, a lot of people love doing that, seeing how many unsolicited games crafted by amateurs arrive at Ravensburger's door – but creating a successful new game is not just about talent and creativity,' says Thomas, 'it's about well-structured, analytical hard work.'

## TESTING TILL IT FEELS GOOD

For Ravensburger, research is key. 'On an operational level, we don't simply rely on our gut feeling,' explains Thomas. 'We do a lot of market

## THE MAIN GOAL OF THE GAME IS ALWAYS FUN

research and consumer testing. If games are not working, we go back and rework them. If they still don't work, we discard the idea.' Testing is done at various stages, often starting with a paper prototype, even for digital games. 'We're heavily into prototypes, getting something in front of consumers as soon as possible. And then we just test until we think: Now it feels good.'

Testing products on kids is of vital importance, because their reactions are always terribly honest as opposed to polite. 'They give very direct feedback.' Results can be surprising too. Girls may like a game intended for boys, for instance, while twelve-year-olds might respond well to a game intended for much younger children; so testing is vital, particularly with hybrid games, since they are so new. Testing taught the company, for example, that a product for younger children should not have too many different elements. 'A board, a smartphone and one or two other interactive components – all of that is too complicated for an eight-year-old,' Thomas explains. So that's something the company takes into account when developing new games.

## MODERN FAMILY

Changes in society are another focal point for the company. While the Ravensburger philosophy is still very much about education, enjoyment and togetherness, the company has different ideas these days about what that last word entails. Families no longer automatically consist of a mother, a father and two kids, and games aren't just being played around the kitchen table anymore either. Ravensburger's strategy is to provide games

that are suitable for various amounts of players. 'You should get rid of that fixed image. Society is changing. We want to provide a valuable experience, be it for a single player or six to eight players. Yes, you might want to play a game when your family comes together, but you might also want to play a game against the computer when you're alone on the road, or conversely, you might want to play with any number of friends.'

## FAIR GAMES

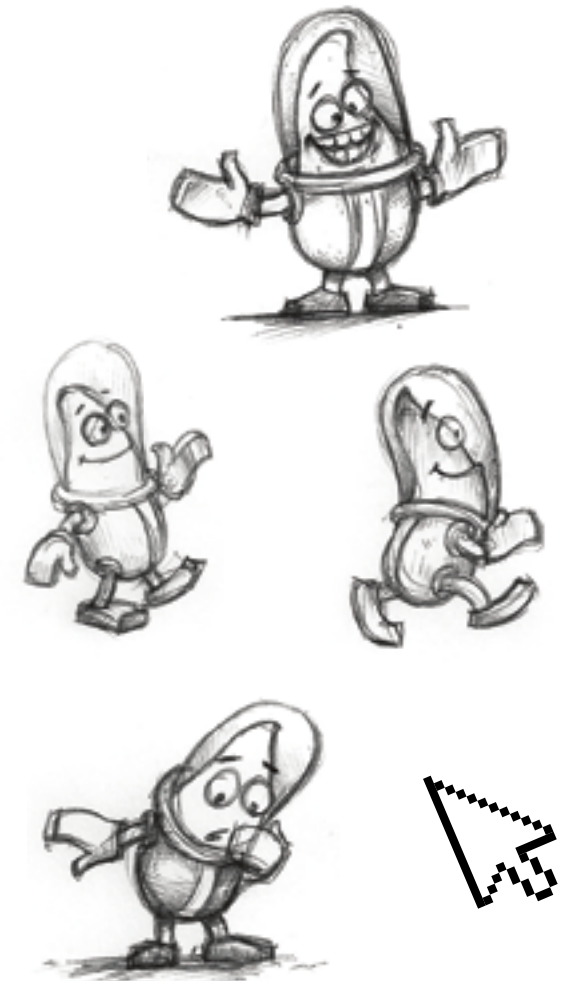
Earlier in 2014, the company presented four new hybrid games at the Nuremburg International Toy Fair, all of which were very well received there. They have been available since October 2014.

One of these games is *Microminds* (see page 75), about a spaceship full of funny, chaotic little aliens. Their spaceship has crash-landed on earth and the aliens turn to kids to help them repair it. In order to go back home, they need to run all sorts of crazy experiments because they don't know the laws of physics and chemistry that apply here on Earth, and the players need to help them with these. 'Here, the digital aspect of the games means you can do all kinds of things that you could never do in real life because it would be too dangerous. Now kids can learn about creating energy or heat or explosions in a safe way,' says Thomas. 'In combining the physical and the digital we want to create this wow-effect, this magic moment. Your smartphone is no longer a smartphone – it's a magnifying glass looking into a new world.'

Another game that Thomas is very excited about is a quiz board game that makes use of Ravensburger's new 'iSystem' for board games, Smart-Play, which uses specially developed visual recognition software in a smartphone hovering over the board. 'In the quiz, you can enter the players' ages, and the phone will ask you age-appropriate questions. This means that adults and children can directly compete with each other, something which would never be feasible in a normal quiz on knowledge, in which the adults would probably

indulgently let the kids win. This is a good example of the digital component providing real added value for a family.'

Both of these games have very obvious educational benefits; yet although education has always been at the heart of Ravensburger's products, it remains implicit. Yes, the educational value will be subtly communicated to the parents via the packaging, but the main goal of the game is always fun. Otherwise, says Thomas, it would never work. It would be like trying to force-feed your kid something healthy but horrible. 'Food has to taste good; games have to be fun.' Sometimes simple philosophies are best. ☒





# PLANTING THE SEED

AUTHOR & ILLUSTRATOR **LINDA LIUKAS**



## SUCCESSFUL CROWDFUNDING FOR CHILDREN'S BOOK

GETTING  
KIDS EXCITED  
ABOUT  
CODING

In the digital age, computer-coding skills are as important as basic literacy. Yet the ranks of programmers continue to be dominated by a single group of people: white men. Linda Liukas hopes to increase diversity among software writers by getting children excited about the profession at an early age. To spark their interest, she is deploying the power of narrative and the prospect of 'awesome things'.

Linda Liukas's fascination with information technology began with fellow geek Al Gore, a former U.S. vice president who, while not quite 'inventing' the Internet, has arguably done more than any other politician to promote its development. In the 1990s, Gore sponsored legislation that funded the expansion of Arpanet, the first and most influential merging of computer networks, which ultimately gave birth to the Internet. His efforts enabled, among other things, the creation of Mosaic, an early Web browser that helped make the Internet accessible to the masses.

But none of this mattered to Linda in 2001; she was a teenager in love. Hormones raging, she decided that clipping pictures of Al Gore from magazines and sending dreamy letters to Washington from her home in Finland just wasn't enough. In order to pay her remote idol sufficient tribute, she would have to build a website. That was easier said than done, however. 'At that time, there was no Tumblr or Pinterest,' says Linda, referring to some of the tools that make Internet publishing easy today. 'I had to teach myself HTML and CSS.'

## STARTUP: HELLO RUBY



**Book:** [Hello Ruby](#)

**Author & illustrator:** Linda Liukas

**Aim:** Getting children excited about programming and introducing them to basic coding concepts.



**Dreams:**

A Hello Ruby app & a Hello Ruby guide that helps parents assist their budding programmers.



**Accolades:**

A very successful crowdfunding campaign. Her initial goal of \$10,000 was reached within a few hours. The end result: \$381,000 by 9,258 backers.

I HAD TO TEACH  
MYSELF HTML  
AND CSS

Years passed, her teenage crush faded and other interests prevailed. Linda studied philosophy and French, and her attention shifted to local, more attainable boys. The website fell by the wayside. But one lesson from the Al Gore episode stuck: If you want to create something badly enough, you will find a way to do it.

It's an insight Linda still applies in her efforts to excite children about computer sciences.



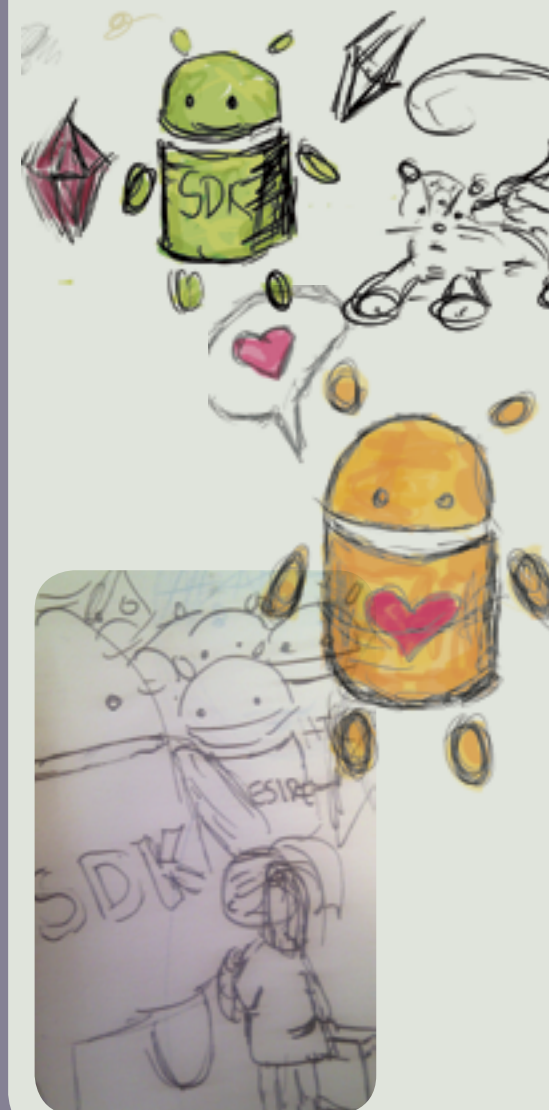


Rather than lecturing them about brackets and command lines, she encourages kids to think of computer code as a tool with which to make ‘awesome things’. Focusing on the creative possibilities of programming has also contributed to the success of ‘Rails Girls’, the initiative for which Linda is best known. Since its first meeting in 2010, the organisation has taught coding to tens of thousands of young women in 160 cities worldwide. Rails Girls events continue to be hugely popular, with applications outstripping available places at every workshop.

## MY GOAL IS TO TEACH KIDS HOW TO THINK

### THE POWER OF STORYTELLING

Not one to rest on her laurels, Linda has already moved on to a new project, aimed at generating interest for coding skills among the very young. She is currently writing and illustrating a book, *Hello Ruby*, which introduces children aged between five and seven to basic computer programming concepts. In addition to catering to children’s passion for creating, Linda is deploying the power of narrative for this group. ‘The best way to convey a challenging concept is by telling a story,’ she says. ‘It also helps bring to life what might otherwise be a boring topic.’ In doing so, she draws on the rich storytelling cultures of Finland and Scandinavia. The Nordic countries, after all, have not only brought forth major computer technologies, such as Linux and MySQL, but also produced many children’s classics, such as the *Moomin* and *Pippi Longstocking*.



### FROM DREAM TO REALITY

## THE BIRTH OF A HEROINE

Ruby, the redheaded protagonist in *Hello Ruby*, was born – appropriately – during programming class. While learning coding many years ago, Linda Liukas developed a habit of doodling in the margins of her work papers. One drawing stood out: a redheaded girl with a striking resemblance to the author. ‘All of a sudden, brave little Ruby was waiting for me on the paper, inviting me on a journey,’ says Linda.

Named after a popular computer programming language, Ruby became something of a companion as Linda worked through her lessons. ‘Whenever I ran into a problem, I asked myself, “How would Ruby explain this?”’ Later, when Linda started teaching programming to others, she used Ruby as a teaching aid – a strategy that clearly resonated with her students.

In *Hello Ruby*, the heroine embarks on a journey to recover gems that have been scattered around the world. On her journey, she meets a beautiful yet aloof snow leopard (a reference to Apple’s operating system), funny little penguins (Linux’s logo) and a Firefox (after the popular Web browser) – and many, many bugs.

As Ruby solves problems along the way, readers are introduced to basic coding concepts such as sequences, loops and variables. Scheduled for publication in spring 2015, *Hello Ruby* will be available as a hardcover book (\$40) and a digital download (\$20). The book can be pre-ordered at [helloruby.com](http://helloruby.com).



# SUCCESSFUL CROWDFUNDING IN 8 STEPS

## A BIT OF LUCK AND LOTS OF WORK

Publishing a book costs money, even if you intend to write and illustrate it yourself.

Linda Liukas figured she'd need about \$10,000 to cover the costs of production and printing and hiring an editor for Hello Ruby. At the suggestion of friends, she turned to Kickstarter, a popular crowdfunding site. The campaign succeeded beyond her wildest dreams. Within just a few hours, Linda had achieved her \$10,000 goal. By the time the event was over, supporters had pledged almost \$381,000.

While the enthusiastic support reflects the appeal of the product – Hello Ruby fulfils a clear need – it is also due to careful planning. As Linda points out, a successful crowdfunding campaign is a bit of luck but mostly hard work and dedication. Also, she cautions, Kickstarter should be the last step of a project, not the first. On the Hello Ruby website ([helloruby.com](http://helloruby.com)), Linda shares eight secrets to running a successful crowdfunding campaign. Here's a summary:

### 1 Select an appropriate project

Not all ventures are suited to a crowdfunding campaign. The trick is to select 'a problem that won't leave you alone.' Offering something that is finite and concrete helps convince your backers that the project will happen. Offering something that taps into a bigger theme enables your backers to dream with you.

### 2 Build a community

Kickstarter works best when you understand either the existing community or the potential community around your project. For Linda, the Hello Ruby community was Rails Girls, the grassroots movements she co-founded to get young women excited about coding.

### 3 Tell a story

Doing so will help communicate the vision of your project. It is important, however, to tell the story your target group wants to back – not the one you would back. Be concise in the first paragraphs, but don't be afraid to include more information if needed. Interested people will scroll down once you have their attention.

### 6 Launch

Generate buzz by notifying everybody in your community. List the influential people in your network and send them a personal email about your project prior to the launch. Reach out to the press and relevant bloggers.

### 4 Plan your budget

Calculate production costs, pledge amounts and shipping costs. While the budget will change and it's hard to estimate where backers will come from, laying everything out in a spreadsheet will help you feel confident about your numbers. Make sure the lowest amount you are asking for won't leave you bankrupt.

### 5 Focus on the video

Pick three to five existing videos that you like and determine why you like them. Come up with visual motives. Is there anything you can show other than a talking person?

### 7 Dedicate time to take care of the campaign

When planning deadlines, don't count on getting anything else done on the project while running the Kickstarter.

### 8 Learn from other Kickstarter projects

Liukas lists several sources of wisdom, including:

- [www.studioneat.com/products/exhilarating](http://www.studioneat.com/products/exhilarating)
- [mcbennett.wordpress.com/2013/06/01/kickstarter](http://mcbennett.wordpress.com/2013/06/01/kickstarter)



Linda's book recounts the tale of little Ruby, a redheaded girl with a striking resemblance to the author, who on her adventures meets characters inspired by programming languages and operating systems, including a snow leopard, penguins and green robots. But the heroine also encounters lots of bugs. As Ruby overcomes the obstacles on her journey, readers learn about coding concepts such as sequences, loops and conditionals. While Hello Ruby does not teach a programming language as such, it encourages readers to approach problems in the same way a programmer would – by breaking them into smaller problems, for example.

Such foundational knowledge, stresses Linda, is more important than learning Java or Ruby per se. After all, computer languages evolve constantly but the fundamentals remain the same. 'My goal is to teach kids how to think,' she explains. Once their interest has been sparked, Linda hopes they will be motivated to acquire the tools to pursue their passions through outfits such as Rails Girls or Codecademy, an online education company for novice programmers.

## FILLING A NEED

While not scheduled for publication until spring 2015, Hello Ruby has gotten off to a strong start. To raise the money required to pay for printing, production and hiring an editor, Linda ran an astonishingly successful campaign on the crowdfunding site Kickstarter (also see sidebar). Her initial goal of \$10,000 was reached within just a few hours. By the end of the fundraiser, supporters had pledged a whopping \$381,000.

Although she has yet to study the exact demographics of her backers, Linda suspects they can be roughly divided into two groups: programmers who want to teach their kids about their profession and parents who are not necessarily technical themselves but appreciate the growing importance of coding skills. Geographically, the support was diverse. Contributions came from every part of the world, with significant donations from the U.S., Japan and Brazil.

## PROGRAM OR BE PROGRAMMED

To Linda, the success of the Kickstarter campaign proves that her project fills a need. 'Currently, if you go to the library looking for a book that teaches children programming, you won't find anything,' she says. 'You will find plenty of books on air-planes, space travel or how combustion engines work. But how many children will grow up to become pilots or astronauts? By contrast, most people will end up using computers in some fashion.'

Although things are slowly changing, public schools don't offer much in the way of coding either. Finland requires its primary school students to learn Swedish – a language that differs significantly from Finnish and is spoken by fewer than 9 million people – but offers no computer programming classes as of yet. 'I don't mean to offend our neighbours, but it would make much more sense to put the effort currently spent on teaching Swedish into teaching JavaScript,' says Linda.

The lack of materials to inspire future programmers is worrying, according to Linda, because in a world increasingly run by software, computer skills are as important as basic literacy. And by 'computer skills', she doesn't mean just the ability to navigate the Web, share a blog post or 'pin' a picture. 'I love Facebook and Pinterest, but they are too limited,' she says. 'You just end up curating instead of creating. Programming expands the tool kit.'

More widespread computer literacy would benefit not only the individuals involved, but also society at large. Like new media theorist Douglas Rushkoff, Linda is convinced that in the digital age, those who have mastered programming will build the reality in which all others live. 'Internet technology is changing everything, including the way we consume information,' she says. Yet there is a big mismatch between the people using technology

## EXISTING RESOURCES

# START PROGRAMMING WITH CHILDREN

Hello Ruby is not due for publication until the spring of 2015. For those who can't wait to start their children on programming, Linda Liukas recommends various resources. Most of these are free of charge.

### For the Youngest (5-8)

- Hopscotch ([gethopscotch.com](http://gethopscotch.com))
- Kodable ([kodable.com](http://kodable.com))
- Scratch ([scratch.mit.edu](http://scratch.mit.edu))

### Toys

- Primo ([primo.io](http://primo.io))
- TinkerBots ([tinkerbots.net](http://tinkerbots.net))

### For Primary School Children (7-12)

- Khan Academy ([khanacademy.org/computing/cs](http://khanacademy.org/computing/cs))
- CodeCombat ([codecombat.com](http://codecombat.com))

### Curriculum and Community

- Code.org ([code.org](http://code.org))
- Mozilla Webmaker ([webmaker.org](http://webmaker.org))
- CoderDojo ([coderdojo.com](http://coderdojo.com))
- DIY.org ([diy.org](http://diy.org))
- CS Unplugged ([csunplugged.org](http://csunplugged.org))

### For Teenagers and Beyond (13+)

- Codecademy ([codecademy.com](http://codecademy.com))
- Codeschool ([codeschool.com](http://codeschool.com))
- Dash ([dash.generalassemb.ly](http://dash.generalassemb.ly))
- Coursera ([coursera.org/course/startup](http://coursera.org/course/startup))

### Ruby for Children

- Hackety Hack ([hackety.com](http://hackety.com))
- KidsRuby ([kidsruby.com](http://kidsruby.com))
- TryRuby.org ([tryruby.org](http://tryruby.org))

### Books and Stories

- Girls Can't Code ([girlscantcode.blogspot.com](http://girlscantcode.blogspot.com))
- Hello World ([stmko.nl/hello](http://stmko.nl/hello))
- Lauren Ipsum ([stmko.nl/lauren](http://stmko.nl/lauren))
- Python for Kids ([jasonrbriggs.com/python-for-kids](http://jasonrbriggs.com/python-for-kids))





## CHARACTERS



Ruby's Adventures

## WALK INSIDE A COMPUTER AND LEARN HOW IT WORKS

(everyone) and those creating it (almost exclusively men). 'We need greater diversity in the people writing software,' says Linda. Although her book does not exclusively target females, she hopes Hello Ruby will contribute to a world in which girls such as Amy Mather, a 14-year-old British coding enthusiast who was named 'European Digital Girl of the Year' in 2013, will become the rule rather than the exception.

## START THEM YOUNG

The best way to increase the number of women working in computer sciences, says Linda, is to get them interested early. While quite a bit of research on the topic has been done by universities such as the Massachusetts Institute of Technology and people such as Seymour Papert (author of *Mindstorm: Children, Computers and Powerful Ideas*), there is no scientific consensus on what is the best age for children to start learning about computers. Linda believes the younger the better – if only to spark an initial interest in the field. 'I started at age 13,' she says, 'but my book is aimed at an even younger group.'

In that respect, Linda finds it encouraging that more countries are incorporating computer programming into their curricula. Estonia, she says, has been a frontrunner. In 2012, this Baltic republic launched a nationwide scheme to teach school kids between the ages of 7 and 19 how to write code. The idea wasn't to start churning out future app developers, but rather to end up with a new

generation of people who have smarter relationships with technology, computers and the Web.

The impact of Estonia's project will of course be limited, given the country's population of just 1.3 million, but similar initiatives are underway in other, more populous countries. Linda says the United Kingdom, in particular, is doing a 'phenomenal job'. Computer coding will become mandatory in all U.K. primary and secondary schools this fall.

There are positive developments in the United States as well, according to Linda – although the devolvement of power in that country's school system means progress will depend largely on the enthusiasm of the individual school districts. Linda's native Finland, with a school system that consistently ranks among the best in international comparisons, aims to add programming to its curriculum by 2016. But rather than presenting it as a separate course in the existing 'information and communications technology' box, the country intends to make coding an integral part of subjects already offered, such as math or biology. If such initiatives come to fruition, readers of Hello Ruby will be well prepared: already enthused about the topic and thoroughly familiar with the concepts.

Meanwhile, with the financial requirements for her book more than met, Linda is already looking at new projects to promote computer literacy among the youngest. She intends to use the surplus Kickstarter money to create a Hello Ruby guide that helps parents assist their budding programmers, and she may even develop an associated iPad application. Linda is also toying with the idea of an art show. 'I would like to create a model that allows people to walk inside a computer and learn how it works,' she says.

Linda's passion for computer technology is contagious. Like her erstwhile hero, Al Gore, she displays an almost missionary zeal in promoting participation in an increasingly digital society. The former U.S. vice president never responded to Liukas's love letters, which, while perhaps unsurprising, is also a bit of a pity – the two of them would have had lots to correspond about. ☒



## THE MAKER MOVEMENT: INVENT TO LEARN

# DO-IT-YOURSELF 'MAKER SPACES'

**Linda Liukas is not the only one to encourage children to start programming. Nowadays more and more kids are being stimulated to understand just how technology works. By tinkering with electronics and coding on their own they can learn and discover basic programming. What is important to know about this so-called Maker Movement?**

### What is the Maker Movement?

Friederike Siller: 'Since Seymour Papert's groundbreaking work *Mindstorms* in the 1980s, constructivist learning through the use of digital media is inevitably connected to the idea of having people work on real-life problems which are of interest and relevance to them. The Maker Movement follows – at least loosely – in these footsteps. It originates from informal, peer-to-peer learning networks where people come together based on a shared interest in making things. The pursuits vary and can range from handicrafts to electronics, from digital storytelling to coding and programming – with an increasing degree of blurring and blending between these fields of activity. Moreover, the Maker Movement is a social movement in which digital technology plays a vital role, connecting people across the globe, based on their interests.

Tools that produce physical products, such as 3D printers, attract a lot of attention among the Do-It-Yourself generation. Still, there is a strong commitment to meet-ups at offline locations as well. Community spaces, such as libraries and after-school programmes, offer areas where children can hang out, geeking together offline in so-called maker spaces or fab labs.'

### What is available for children? How active are they in the Maker Movement?

'Children love making things, doing handicrafts, building and tinkering with things they're interested in. These activities become even more fun for children once they are in a social environment where they can collaborate with others. There already are many great opportunities for children, both off- and online. The digital world for children includes programming tools such as



**FRIEDERIKE SILLER**, Professor for Media Education at the Cologne University of Applied Sciences, Germany, shines her light on the Maker Movement, and in particular what it brings for children. Her research in the field of media education strives for a better understanding of the development of media literacy. Most recently, she has been involved with setting up a Media Literacy Lab for students and practitioners where they can contribute towards Open Learning in Media Education ([medialiteracylab.de/english](http://medialiteracylab.de/english)).

*Scratch*, building tools like *Minecraft* or web literacy tools such as *Mozilla Webmaker*. Children can be very active players in the digital world, and chances are fairly good that the artefacts children present and share online will find an audience, receive praise, attention and possibly even make a difference. However, it is important to have supportive parents and teachers who can help children navigate online and assist them in exploring their interests digitally.'

### What influence will the Maker Movement have on the market for children's products?

'Once they are available, children will definitely be quick to latch on to tools like 3D printers that produce physical products – just imagine kids being able to design and produce their own bricks and toys! The market for children's products will be sure to follow them. The Maker culture already is – at least partly – economically driven. The 'Internet of Things' is a promising new market and maker cultures are exploring innovations in this field, so inevitably some companies will be interested in getting involved. With this in mind, one can start figuring out more pedagogical or perhaps even political approaches – just think of hackathon events that teach young people how to code for a better world.'

### What is your view on media education through the Maker Movement?

'While the Maker Movement is most definitely not fundamentally new, it can offer an attractive space for children in which to explore media in a manner which is fun and engaging. Maker spaces focus on the learner and learning community rather than on the delivery of facts. Maker culture therefore affords the learner a high degree of freedom. Communities of makers unite people who are curious, enthusiastic and passionate about the making of things. Generally speaking, these members welcome

the reusing, remixing and redistributing of the things they've made. Seeing as the Maker Movement is so strongly tied to peer-to-peer learning, collaboration and interest-driven learning, it is an opportunity

not only for informal learning but also for formal educational institutions. It can bring us a step forward in establishing a sound foundation for meaningful learning.'

## INSPIRATION

### COMMUNITIES

- **MakerKids**  
[www.makerkids.ca](http://www.makerkids.ca)
- **LA Makerspace**  
[www.lamakerspace.com](http://www.lamakerspace.com)
- **Make Things Do Stuff**  
[www.makethingsdostuff.co.uk](http://www.makethingsdostuff.co.uk)
- **Makey Makey**  
[www.makeymakey.com](http://www.makeymakey.com)
- **Young Rewired State**  
[www.youngrewiredstate.org](http://www.youngrewiredstate.org)
- **Maker Gallery**  
[www.maker-gallery.de](http://www.maker-gallery.de)



### PROJECTS

- **Maker Club Playbook**  
[stmko.nl/playbook](http://stmko.nl/playbook)
- **Make Magazine**  
[www.makeprojects.com/Topic/Kids](http://www.makeprojects.com/Topic/Kids)

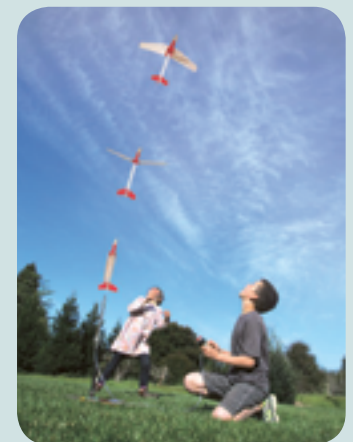


### VIDEOS

- **Super Awesome Sylvia**  
[www.sylviashow.com](http://www.sylviashow.com)

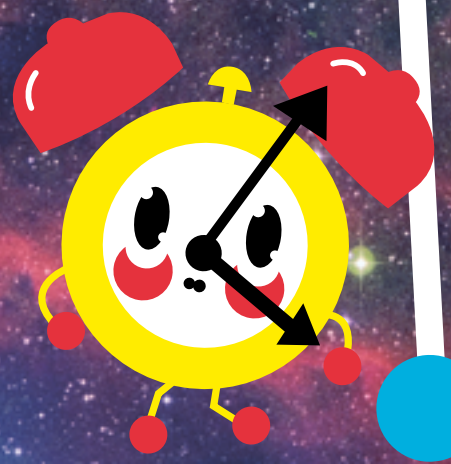
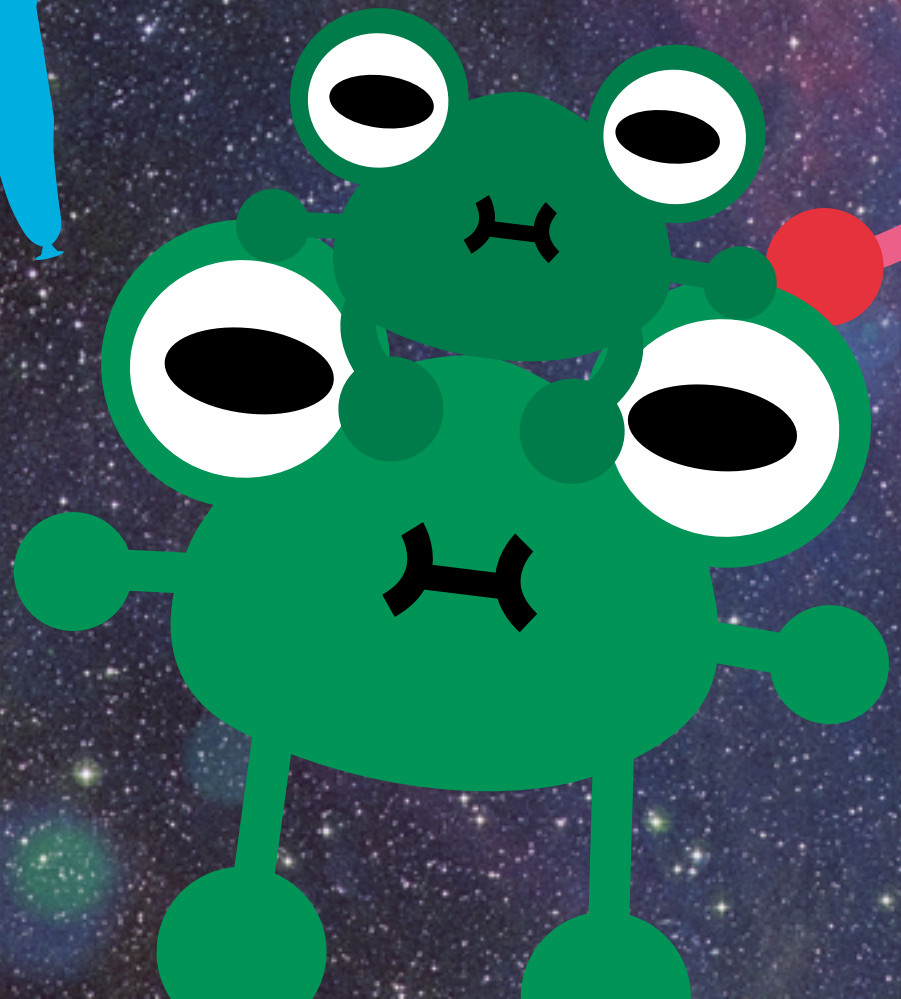
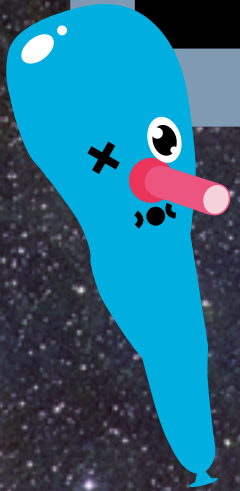
### TOOLS

- **Raspberry Pi**  
[www.raspberrypi.org](http://www.raspberrypi.org)
- **Arduino**  
[www.arduino.cc](http://www.arduino.cc)
- **Minecraft**  
[www.minecraft.net](http://www.minecraft.net)
- **Building with Chrome**  
[www.buildwithchrome.com](http://www.buildwithchrome.com)





THE PLAYFUL WORLD OF  
**TOCA  
BOCA**



TOCA BOCA CHARACTERS

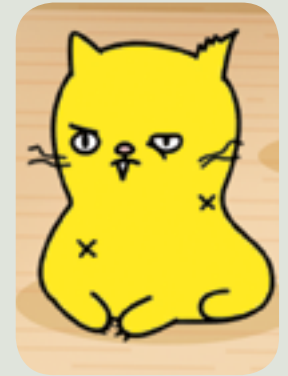
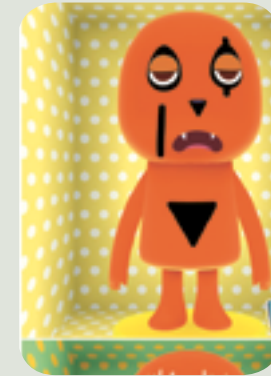


70 MILLION APPS DOWNLOADED

# INSIDE A SUCCESSFUL STARTUP

From a psychedelic cat with a mouthful of marbles to a glum blue cow with an 'old school' tattoo, it's clear that the characters inhabiting the world of Toca Boca are not your standard smiley, sugar-coated creations for kids. Now, with its latest launch – Toca Boo – the Swedish-based app company once again proves that it thrives on doing things differently.

## SHOWCASE COMPANY: TOCA BOCA



**Company:** Toca Boca, Stockholm Sweden

**Owned by:** Bonnier media company (established in 1804!)

**Number of apps:** 24 and growing

**Target audience:** 3 to 8 years old

**Aim:** fun, non-competitive apps to stimulate creativity in young children

**Accolades:** In 2013, Toca Tailor and Toca Hair Salon Me (a version enabling the use of your own selfies) were selected as the best innovative apps and

games for kids by the popular German review site, bestekinderapps.de.

In 2012, Toca Hair Salon also featured in Time magazine's list of top 25 iPad apps for kids (2012).

Toca Boca was only founded in 2010, yet it has since grown into a prominent player in the children's app market. With more than 70 million downloads of their apps in 169 countries, the company is clearly onto something.

### THEIR PHILOSOPHY

Their secret? Play designer Chris Lindgren (36) has been with Toca Boca from the beginning and sums up their core philosophy: 'We make toys, not games,' she says. It's an important distinction. She goes on to explain that toys, as opposed to games, are more open-ended in their approach. They are materials to play and fantasize with. 'The best toys have a strong replay value; kids can keep finding new ways of playing with them,' Chris adds. That is what Toca Boca strives for in its apps. Also, whereas other apps may focus on learning cognitive skills in a more traditional sense, the focus

here is on fun. Why? Because at Toca Boca, playing and having fun are considered 'the best way to learn about the world'. Their aim is to stimulate young children's imagination and support their creativity in a non-competitive digital environment, coupled with a child-friendly usability.

The lack of spoken language or written instructions is a further feature defining Toca Boca apps. This was a conscious decision made early on, and has two benefits. Firstly, it makes the products more international and therefore more financially viable. You can reach a global market without having to translate so much as a single word.

## WE MAKE TOYS, NOT GAMES





Secondly, as Chris points out, it can help to make kids feel empowered: they don't need their parents' help to play the apps. At the same time, Toca Boca purpose-builds many of its apps as shared experiences, incorporating multi-touch features so children can play with others if they want to, be it with siblings, friends or parents. It's a way to practise valuable social skills such as taking turns.

## KIDS' PLAY PATTERNS

Knowing what you want to achieve with an app is one thing, but coming up with a specific concept for a successful new app is something else. 'I'll start by thinking of a theme or certain play pattern that I know kids are interested in,' Chris says. She mentions classic role-playing scenarios such as cooking, tea parties or shopping (it is no coincidence that Toca Boca has based apps on all of these situations). Then, she'll bring in executive producer and company co-founder Emil Ovemar (37) to brainstorm lots of ideas around that theme, always looking for an extra twist. Together they see which idea has the most potential, both in terms of technical realisation and the all-important fun factor.

Chris has a BA in Children's Culture and, as a mother of a two-year-old, you could say she is rather in tune with the target group. It was actually her daughter's response to a book by Moomin creator Tove Jansson that spawned the most recent app, *Toca Boo*. 'The book has a dark and mysterious atmosphere and my daughter was so interested in it! I wanted to use that somehow,' she says.

## CO-CREATING & TESTING

With the 'scary' theme determined, and armed with basic paper prototypes of cut-out characters on sticks, Chris headed off to a local preschool to see how children would play with them. 'We played around with a ghost moving through different rooms and scaring others,' she says. She

# KIDS DON'T NEED THEIR PARENTS TO PLAY APPS

stresses the importance of playing in an 'open' way at this stage, without holding on to a set idea. After all, what adults find fun and what classifies as fun for kids is often not the same, so the best way to guarantee fun is to develop products in close collaboration with kids and to test them. At Toca Boca, this is an intrinsic part of the process.

During this early play session, Chris found out that kids absolutely love to scare their parents at home. It came back in their stories again and again. Also, the bathroom proved to harbour a hiding place that was incredibly popular with the kids: the toilet.

Input and feedback from such sessions play a vital role in shaping the product. 'After that first session, I knew that I wanted Toca Boo to feature a family; a slightly scary and odd one.' In the case of *Toca Tea Party*, Chris found out in a play session that one of the things that the kids liked best in this scenario was to spill their drinks, so it was promptly added to the game. 'Generally, kids love it when something strange happens which they wouldn't be allowed to do in real life, or which wouldn't be possible,' Chris adds.

Testing continues throughout the development phase, occurring every third week until the app is finished some four to eight months later. 'You have to go into a session and be prepared to change everything. If the kids don't think it's fun, or the interaction doesn't work, it's back to the drawing board,' Chris says. In the past, they have shelved an entire project because although the parents liked it, in testing it transpired that the kids didn't. The concept was too complicated.



# DO'S & DON'TS

BY CO-FOUNDER EMIL OVEMAR

## DO

### 1 Define the product

Know what you want to do with your product and stick to that. What experience do you want to create?

### 2 Think small

A small core experience can be enough for kids. Adults may think 'is that all'? But for kids, it'll be perfect. Kids like repetition; adults find it boring.

### 3 Polish until brilliant

Test products more than you would ever imagine and focus on getting things right, even if it causes delays.

### 4 Get noticed

A great product isn't enough these days. Make sure you have someone to spend 50% of their time making your product visible. Use any tactic to get people's attention, like starting off with free apps.

### 5 Be brave

Have the courage to make something new: add your own personality, innovate, and trust yourself. Don't think about what's already out there.

### 6 Hire people you trust

If you hire people you trust and like what they make, you can give them the freedom to bloom. Make sure to give them that freedom.

## DON'T

### 1 Don't be naive

You need to understand the reality of the business side before you start. Get market data, think about the product. Are you going for free apps or paid apps? Choose strategies and concepts well.

### 2 Don't forget your audience

Make it a top priority to get to know kids. Be around them – a lot! Invite them for workshops, watch them at play and play with them.

### 3 Don't think local

To make the business work, you need to go global. If your aim is to be the number one app in a single country, you're not going to earn enough money to support a business.

### 4 Don't work in a vacuum

Make sure there is someone around to question you and your decisions. Make each other better! Constant discussion stimulates quality and ensures that everyone has the same vision.

### 5 Don't add too much

You shouldn't go overboard with extra features. If you're adding too much, you're not thinking like a kid. Keep it simple.

### 6 Don't be afraid to be silly

Don't dismiss ideas that don't make sense, sound stupid or silly – kids can appreciate that.



## THE TOCA BOCA TEAM

### THE MAKERS



Illustrator  
**ARVID TAPPERT**, 33

**Children:** Yes, a son (4) and a daughter (7)

**Favourite app for kids:**  
[Endless ABC by Originator Inc](#)

**Would like to see:**  
Back 2 the Future 4



Play Designer  
**CHRIS LINDGREN**, 36

**Children:** Yes, a daughter (2½)

**Favourite app for kids:**  
[Sneak by Made in Me](#)

**Would like to see:**  
A sad app for kids



Executive Producer  
& Company Co-founder  
**EMIL OVEMAR**, 37

**Children:** Yes, a son (9) and a daughter (6)

**Favourite app for kids:**  
[Toca Hair Salon](#)



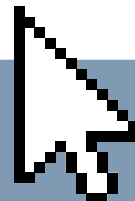
Programmer  
**MARKO PERMANTO**, 29

**Children:** Yes, a daughter (7)

**Favourite app for kids:**  
[Sago Mini Forest Flyer](#)

**Would like to see:**  
Game-making app for kids

THEY USE THEIR WHOLE HANDS, THEY TOUCH EVERYTHING AT THE SAME TIME, AND THEY'LL EVEN LICK THE SCREEN!



## THEY'RE SUPER EAGER TO SHOW OTHERS... THAT'S THE MAGIC MOMENT

### FOCUS ON THE FINGERS

A total of three groups of two pre-schoolers are tested per session. The company tries to get a good mix every time, with different interests and backgrounds. The sessions are filmed, enabling Chris to concentrate on being in the moment with the kids. In filming, it's all about what the fingers are doing. Those first touches on the screen are highly revealing. Chris goes through the footage afterwards, noting exactly when children encounter a 'dilemma' – something that gets in the way of their play experience. It's the team's job to solve it. Sometimes the game play itself needs changing; other times it's a usability issue. Programmer Marko Permanto (29) says that in his job, he spends about 50% of his time tweaking things, based largely on what Chris notices during testing.

'In the case of Toca Boo, we found out that the kids didn't understand that they had to tap the ghost for the "Boo" effect,' Chris says. 'We tried a "Boo" button for a while until we found the ultimate solution: a tap on the victim.' It was also in testing that she realised how important sounds are in the whole experience. 'I'll act out what I'm doing with sounds while I'm with the kids. The sounds bring the characters to life and the

children really respond to them.' So, how can she tell when they've got it right? 'When you see kids laughing, or they're super eager to show others. That's the magic moment.'

The feedback loop doesn't necessarily have to end after the product has been launched. Comments about the apps are collected from Facebook, Twitter and the App Store. Every time Chris starts developing a new app, she'll dig through the reviews first to see what she can take on board. There are lots of requests for specific themes. 'We had tons of people wanting an app about caring for animals, so it was natural to create *Pet Doctor*,' she says. In the same vein, the sheer number of requests for extra *Hair Salon* features spawned a whole new version, *Hair Salon 2*. It's their most popular paid app to date, with 7.5 million downloads. According to app tracker Distimo, *Hair Salon 2* has been the most frequently downloaded, paid app in their Kids category, ever since they launched the category. Originally designed for three-to-six year olds, the app has become a hit with all age groups, including teens.

### CHARACTER-BUILDING

While the play concept is the beating heart of the experience, the power of visuals cannot be overestimated. That is why Toca Boca illustrator Arvid Tappert (33) is brought in at an early stage, starting off with mood boards based on the concept. Arvid explains that although there is no official 'style guide' for the three artists at Toca Boca, the artwork shares a certain 'quirkiness'. For him, this is what sets Toca Boca apart from the rest.



Paper prototype for Toca Boo



## DON'T GIVE KIDS WHAT THEY EXPECT

When it comes to creating the characters, Arvid stresses that they don't all have to be happy or looking too perfect: 'Don't give kids what they expect – I always try to add something surprising, like a cute girl with crooked teeth, or an odd way of moving, or a small figure with a deep voice.' His advice for other illustrators just starting out is not to be afraid to experiment. Technical skills are important, but they are not as important as creating your own style. In the early stages of development, Arvid keeps sketching, playing with different expressions and body volumes until he finds something 'fun'. In Toca Boo, for example, he created an old grandfather figure with a spider-like walk. In another character for the same app, he incorporated a touch of social critique in the form of a teenage boy who is always hunched down looking at his phone. He only looks up when the ghost scares him.

One of Arvid's main complaints about other children's apps, and the toy industry in general, is gender stereotyping. A key criterion for Toca Boca characters is that they are unisex or challenge traditional boy/girl roles. And so for example in Toca Boo, the ghost is a girl. 'In so many stories or games the main character is a boy. I wanted to show that a girl can be the leading figure too,' Arvid says. One of his favourite childhood characters is 'He-Man': 'Very manly, with lots of muscles, but also long blond hair and pink clothes.' It's this jumbled gender mix that still inspires Arvid today: 'By playing with such traditional gender stereotypes, you can make characters more interesting.'

## TIME FOR QUALITY

With relatively straightforward play concepts, at Toca Boca the magic and humour is in the details. Developing those details and getting them right takes time. That time is factored into the workflow. 'We're really stimulated to experiment and find new things,' Arvid says. It's a direct investment in the quality of the end product. 'What you do has to be good; if it's not good, it needs more work,' he says. He has noticed that other app makers don't always seem to make quality a priority: 'It looks like they've taken the first idea and produced it as fast as possible. That's a shame, because while they may

## INSPIRE YOURSELF

As well as organising sketching sessions with colleagues, illustrator Arvid Tappert also recommends keeping tabs on everything from animation films to music videos as an ongoing source of inspiration.

A few of his favourites:

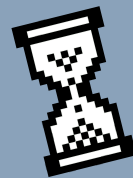
→ [studiooaka.co.uk](http://studiooaka.co.uk)



→ [studiosoi.de](http://studiosoi.de)



→ [motionographer.com](http://motionographer.com)



## FORMULA KEYWORDS TOCA BOCA DNA

→ Unisex

→ No in-app purchases

→ Non-competitive

→ Fun & open-ended

→ No language or written instructions

→ Replay value

→ High quality

## TEST! SETTING UP A PLAY SESSION

Regular play sessions with children are an invaluable source of input and feedback when it comes to developing and testing new children's apps. Toca Boca play designer Chris Lindgren offers a few pointers.

- Two pre-schoolers per session works best. One child on its own tends to become shy, and three children generate too much discussion.
- Sessions shouldn't last for too long: 20 to 30 minutes will do.
- Involve a variety of children from different backgrounds.
- Organise regular sessions throughout the development phase (try to do them every three weeks).
- Organise sessions via pre-schools. The school can inform the parents.
- It's also good to see how kids play in their home environment with

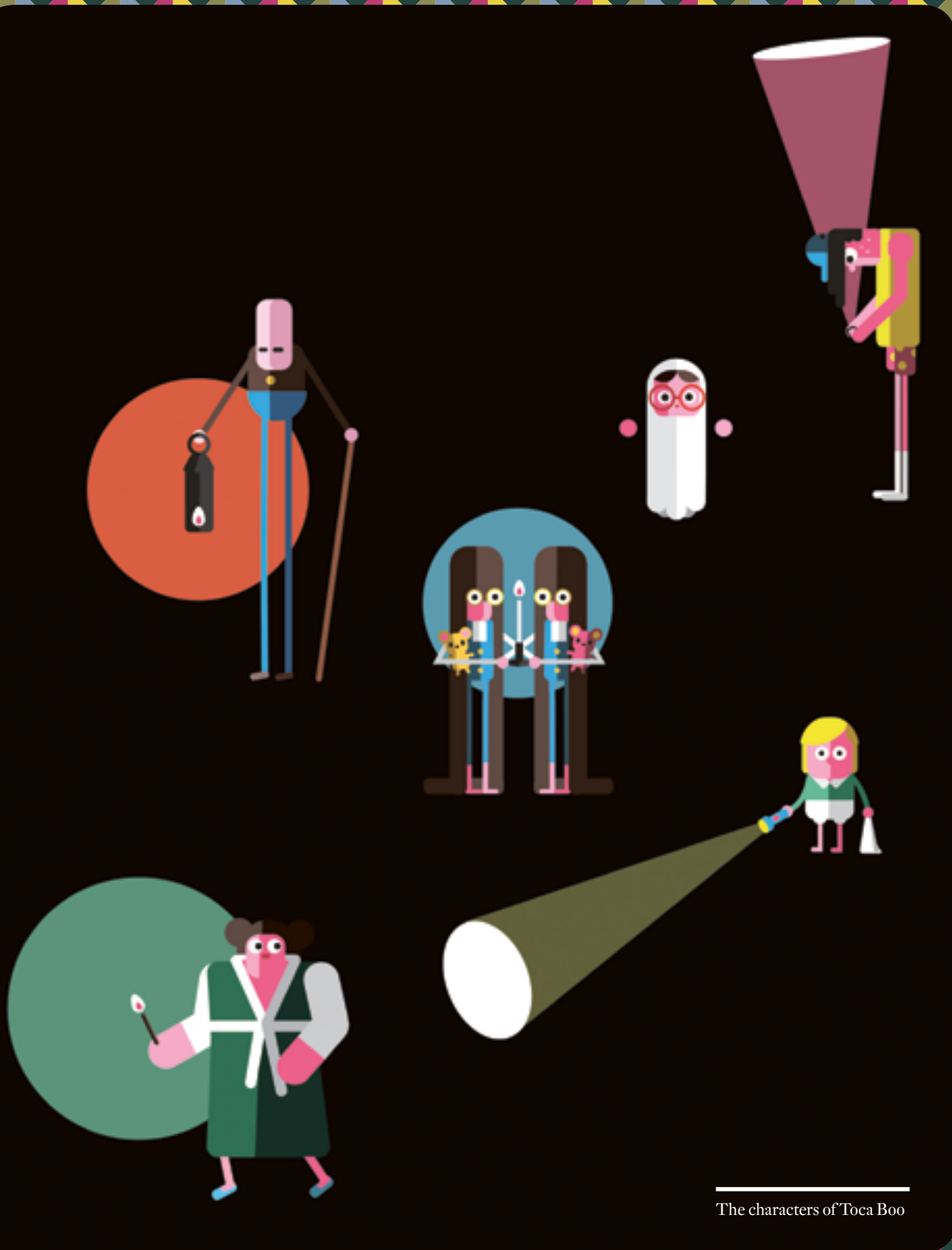
- parents or siblings, especially if you're new to the field.
- Don't talk too much. Encourage kids to try different things and discuss what they see on the screen.

- Start with small hints if you have to, but don't tell them what to do too early – that's the worst thing you can do.
- Keep calm and give shy kids enough time to respond, or let the teacher join in to help the kids feel at ease.
- Filming the sessions lets you 'be in the moment' with the children, so that they can relax. Analyse the footage later to see what does or doesn't work.
- Look for laughter: what makes the kids smile?



Character drawn by Li (6)





The characters of Toca Boo

## IT WAS SILLY AND WEIRD AND DIDN'T MAKE SENSE, BUT IT FELT FUN

have a great concept and great artwork, it doesn't feel finished – yet if they had worked on it for just a month longer, it could have been really good.'

His teammate Marko agrees. 'Programming a new app is supposed to take us four months, but it usually ends up taking six months,' he says. He has noticed that elsewhere, by the time a product gets to programming, it's more about implementing predetermined ideas. At Toca Boca, there is still room for new ideas – as long as they fit in with the concept and can improve the app. Toca Boo is a case in point: 'We developed a great light beam – it took a lot of time and I don't think that we would have been given that time in many other companies,' he says, adding that in the end, the beam helped the entire game-play of the app.

Marko also stresses how important it is to remember the target audience when programming because children perceive and respond to things differently than adults do. They even move differently. 'Never underestimate the weird things they can do! They don't use touch screens the way adults do – they use their whole hands, they touch everything at the same time, and they'll even lick the screen!' he says. 'You have to accommodate for all combinations on all levels, all of the time. An app could easily malfunction, if you're not counting on that kind of input.'

In addition, he mentions a common misconception about children's apps: 'People imagine that making apps for kids is easier – it's not. You may



not need as much content as you would for older kids or adults, but making an app interesting to younger children is really hard in comparison. They have short attention spans, so the quality and interactivity need to be really high.'

## INVEST IN FUN

Once the app is finished, the fun can begin for the kids, right? Wrong! Co-founder and executive producer Emil notes that actually, the fun should start long before: 'Remember to have fun and play while you work – try to stay in that zone and stop thinking like an adult.' This approach goes beyond a theoretical 'work ethic' – when your core business is designing children's apps, it is actually sound practical advice. To prove his point, Emil mentions how they added a Christmas tree to the seasonal gift version of the *Toca Hair Salon* app, so you can apply your hairdressing skills to the tree as well as Santa. 'We laughed when the idea was presented – it felt a little silly and weird and didn't make sense, but it felt fun. You need to trust that.' That trust in silliness resulted in 12 million downloads. The lesson is clear: invest in fun, and you can make many kids (and adults) very happy. And that's serious business. ☒





# APPENDICES

**CHECKLIST FOR  
POSITIVE CONTENT**  
FOR KIDS AGED 4-12

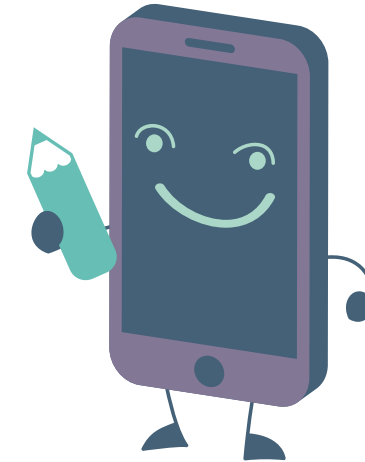
**TEN PRIVACY TIPS**  
FOR APP DEVELOPERS

**ABOUT**  
POSCON & MIJN KIND ONLINE



# CHECKLIST

## FOR POSITIVE CONTENT FOR KIDS AGED 4-12



### Clearly defined target group

- ☑ Target group or age range is transparent and comprehensible.
- ☑ The cognitive development of the target group (physical and mental skills, emotions) is taken into account regarding content, design and navigation.
- ☑ The content is understandable for the target group.
- ☑ Information for parents is provided, especially when the target group is young children.

### Attractive content

- ☑ The content is presented attractively, with creative, interactive, innovative, entertaining and/or educational features.
- ☑ The visuals are of high quality, properly labelled.
- ☑ The language is well written and age-appropriate.
- ☑ Positive online interaction and/or offline interaction with peers and family are stimulated.

### Safe content

- ☑ The content is not harmful to minors: it does not contain offensive material (i.e. pornography, racist/violent/offending language, pictures or videos).
- ☑ Children are not directed to external websites with content that is not appropriate for children.

### Usability

- ☑ The navigation structure is user-friendly. Kids do not get lost within the site.
- ☑ The URL is easy and simple to reach. Typo errors will not land kids in domains filled with viruses and advertising.
- ☑ The design facilitates navigation and enables children to find their way easily through the content/site.
- ☑ The content is accessible through different platforms and devices (browsers, mobile devices etc.).

### Reliability

- ☑ Information about the provider/creator is given.
- ☑ Contact details are easily accessible, so that parents or children can get in touch in case of problems.
- ☑ Where relevant, the content offered is true, up-to-date and topical.
- ☑ The content does not infringe on the copyright of others.

### The privacy of children is ensured

- ☑ Privacy laws are respected.
- ☑ No more data than necessary is gathered.
- ☑ Personal data is treated confidentially; exceptions (i.e. for the purpose of delivering a prize) are transparent and it is stated clearly that the data is deleted afterwards.
- ☑ Information about privacy is clearly visible and presented in language suitable for target group and parents.
- ☑ If the data of visitors is processed while they are using the site, this should be clear.
- ☑ If children can share their personal data, they must actively confirm they have obtained parental consent.

### If social media communication features are present

(social networks, chatrooms, forums, guest books, video platforms etc.)

- ☑ Specific rules and security information on how to use the services safely are offered (i.e. guidance on netiquette, protection of personal data, protection against cyberbullying, etc.).
- ☑ Parental consent is asked for, if registration is required.
- ☑ Easy-to-use, easy-to-find reporting mechanisms are provided, (i.e. an alarm button, in case children need help or advice or want to report potentially harmful content or contact).
- ☑ Constant monitoring of user contributions ensures that all content which may be harmful to children is deleted.

### If commercial elements are present

(advertising, sponsoring, online shopping etc.)

- ☑ Commercial elements, advertising and online shopping facilities are clearly set apart from the content, easily recognisable, labelled as such and age-appropriate to the target group (e.g. no advertising or shopping for alcohol or cigarettes).
- ☑ Commercial elements do not restrict the user's control of actions.
- ☑ There is a financial limit to what children can spend on the site or in the game.
- ☑ The commercial proposition is openly communicated.
- ☑ Payment methods require parental control.



# TEN PRIVACY TIPS FOR APP DEVELOPERS

Privacy isn't the first thing that developers think about when they are designing an app for children. So here are ten tips for app developers to help them increase the privacy friendliness of their educational apps.



**1 Don't save the matter of privacy for last.** Start thinking about the protection of personal data while making the app. This is called 'privacy by design'.

**2 Think about what information the app should collect.** For each item of personal information, consider whether it is actually needed in order to make the app function well ('data minimisation'). Is geographical location *really* necessary? No? Then don't collect it. Explain what the app does collect, and why.

**3 Don't collect data from children below the age of 13** for the purpose of enabling specifically targeted advertisements.

## THINK ABOUT WHO IS THE TARGET GROUP OF THE PRIVACY POLICY

**4 Encode the personal data you collect!** Encoding ensures that if data packages are tapped while being transmitted, the information will only look like unintelligible abracadabra. By encoding the email addresses, telephone numbers or other data you collect, you make it harder for people with bad intentions to decipher them.

## YOU SHOULD TRY TO STIMULATE PEOPLE TO READ THE PRIVACY STIPULATIONS

**5 Ask permission from the parents of the child to use personal data.** For example, incorporate into the app the phrase, 'Ask your parents to read this', so that the child has to go get a parent. Of course, a child could always simulate parental permission, but then at least you will have done your best as an app developer. If a case should come to court, you must prove that you have done what you could to check whether the parents have given their permission.

**6 Think about how to check the user's age if the app is going to have an age limit.** Filling in the year of birth is a start, but that's easy to get around. Here too, you must be able to show that you have done everything that can reasonably be expected to check the age of the child.

**7 Draw up a privacy policy that is understandable** for both kids and parents. Think about who is the target group of the privacy policy – nobody will be any the wiser from a text that mixes hip baby talk with an amorphous blanket of legal jargon. Make it clear which text the child should read and which text the parent should read. If you use stipulations from other apps as a template, study each paragraph and think about how it could be stated more simply. 'Jurists should learn how to speak and write understandably. It really isn't so difficult to write understandable prose. It just takes a little more time,' says jurist Jetse Sprey.

**8 Make sure that the privacy policy is presented to the parents before** the child starts using the app. So, instead of providing a checkbox that children can click on without the privacy policy coming into view, show the actual text accompanied by a notification to children to get their parents. 'You should try to stimulate people to read the privacy stipulations. You should call attention to them clearly. At present, app developers try as much as possible to create a situation in which people can easily click onward without reading,' says Floris Kreiken from Bits of Freedom.

**9 Refer to rules of conduct or privacy tips on your website if it shows them.** The Snapchat app, for example, has a page with useful information for parents, but that can only be found by clicking on a link in the privacy policy on its website. Habbo also has a page with safety tips on its website that is not referred to in the app. That's a pity.

**10 Make sure to explain the app's privacy policy** in your description for the app store so that the user can see what personal data will be collected before downloading the app. Permission to use personal data should be asked before the app takes information from the client's equipment or places information on it.



# ABOUT POSCON & MIJN KIND ONLINE

## POSCON

POSCON – Positive Online Content and Services for Children in Europe – is a thematic network co-funded by the Safer Internet Programme of the European Commission to devise plans for stimulating positive online content for children. POSCON aims to make a substantial contribution to the topic of child safety online at a European level. It brings players and stakeholders in the field together for the first time, enabling them to exchange expertise, concepts and content in a way that has not been done before.

## MEMBERS OF POSCON

POSCON is coordinated by the State Media Authority of Rhineland-Palatinate. It is implemented in cooperation with two organisations based in Germany, fragFINN and Jugendschutz.net, and Mijn Kind Online, operating from the Netherlands. POSCON consists of institutions and companies from over 15 European countries – content producers and providers, researchers, parents' associations, experts from the area of media for children.

## CRITERIA & CHECKLIST

One of the contributions POSCON has made is a document called 'Positive Content Criteria'.



This provides key aspects to consider when producing or providing online content and services for children, such as target group and age-appropriateness, attractiveness, usability, reliability, safety and privacy issues. It also has put together a checklist (see page 112 for an abridged version) that provides a short overview of these aspects. The checklist is available in many different languages.

## EUROPEAN AWARD FOR BEST CONTENT FOR KIDS

POSCON was intensively involved in the preparations for the European Award for Best Content for Kids and has shaped the main features of the competition. The award aims at encouraging children and adults to create new child-friendly, high-quality online content and highlights such content that already exists. The competition

was held in 2013 in most EU member states and also in Iceland and Russia. Guidelines for organising the competition on a national level have also been provided, e.g. recommendations on how to select a national jury, how to promote the competition and how to choose the national winners.

## SPECIAL NEEDS

POSCON has started a collection of links to tips and online tools on the topic of accessibility and the special needs of people with disabilities, which is meant to promote existing initiatives, standards and recommendations all over the world.

## MORE INFORMATION

Please visit our website for further information, documents and updates: [www.positivecontent.eu](http://www.positivecontent.eu)  
Contact: [poscon@lmk-online.de](mailto:poscon@lmk-online.de)

## MIJN KIND ONLINE

Mijn Kind Online (My Child Online) is part of the Kennisnet foundation. Mijn Kind Online provides information about digital media and children (0 to 18) to parents and schools. The work of Mijn Kind Online revolves around the realisation of an important aspiration: that all children can use media for their own development and well-being and for that of others. And that in doing so, they can take the best possible advantage from the possibilities offered by media and technology.

media, the question of safety frequently comes up, and rightly so. Screen time is also a recurrent issue: How long should you allow a child to be busy with a screen? People fear that kids will become addicted. But the discussion should also be about the quality of the contents. What makes an app good? What makes an app instructive or valuable, for example? It is in the interest of parents and schools if we can help the creators of children's apps to make their content even better. That's why we have made this book – to inspire producers and distributors to make the very best for children.'

## THE IMPORTANCE OF QUALITY

Remco Pijpers, spokesperson of Mijn Kind Online: 'In discussions about children and digital

## KENNISNET: ICT & INNOVATION

Mijn Kind Online is part of the Kennisnet foundation. Kennisnet is a Dutch semi-governmental

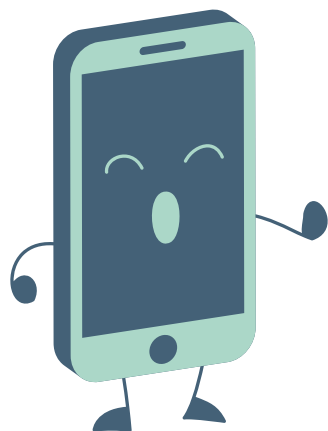


public partner which supports and inspires primary, secondary and vocational institutions in the Netherlands in the effective use of ICT. Kennisnet works closely with several international organisations. Other countries in Europe and beyond have similar challenges with regard to the effective use of ICT in education. From a common agenda, international organisations can share their knowledge, support each other's ambitions and generate higher returns for education. Kennisnet represents the Netherlands in the European Schoolnet, an international network that shares information on innovation in teaching and learning with its key stakeholders: ministry of education, schools, teachers and researchers. Through [European Schoolnet](#), Kennisnet works together with several European partners on the exchange and interoperability of innovations in education and learning resources.

#### CONTACT

Mijn Kind Online  
Remco Pijpers  
+ 31 (0)6 51436711

[remco.pijpers@mijnkindonline.nl](mailto:remco.pijpers@mijnkindonline.nl)  
[www.mijnkindonline.nl](http://www.mijnkindonline.nl)



## CREDITS

#### Editor-in-Chief

Remco Pijpers

#### Coordinator & Editor

Nicole van den Bosch

#### Graphic Design

Suzanne Hertogs, Anne de Laat  
([Ontwerphaven](#))

#### Texts

Lotte Boot, Helen Clifton, Jacqueline Harding, Annemarie Hoeve, Jeannette Jonker, Sonia Livingstone, Lidia de Reese, Friederike Siller, Peter Teffer, Taco Tuinstra, Pamela Williams, Rebecca Wilson

#### Copy Editors

Jane Bemont, Nina de Vries-Cookson

#### Photography

Conny Beyreuther, Helen Clifton, Golli, Rodney Kersten, Christof Mattes, Shutterstock

#### Illustrations

Nozzman, [Ontwerphaven](#)

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## HOW DO YOU MAKE GOOD AND FUN DIGITAL PRODUCTS FOR KIDS?

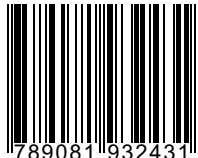
Experts from the BBC, Ravensburger, Toca Boca and others reveal their secrets in this book. What is their vision? What makes a product good for kids? And how do you create it?

For example, if you want to make an app for children, where do you start? How do you get from concept to practical product? And how do you market that?

Creative producers give practical tips about their area of expertise, so they can inspire others to make digital products for children that are of high quality.

With a foreword by Neelie Kroes,  
former Vice-President  
of the European Commission

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