CHILDREN IN VIRTUAL WORLDS

Adventure Rock users and producers study

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The aim of the Arts and Humanities Research Council/BBC KEP is to develop a long-term strategic partnership bringing together the arts and humanities research community with BBC staff to enable co-funded knowledge exchange and collaborative research and development. The benefits from the outcomes and outputs of these projects should be of equal significance to both partners.

To find out more about the AHRC/BBC KEP please visit the AHRC's website at: http://www.ahrc.ac.uk/FundingOpportunities/Pages/KnowledgeExchangeProgramme.aspx

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EXECUTIVE SUMMARY

The research study

This report is one of the outcomes of the collaborative research partnership between the University of Westminster and BBC Children's, funded by the Arts and Humanities Research Council (AHRC) and BBC Future Media and Technology. The research project was the first to focus on a virtual world specifically designed for children aged 7-11, offered by one of the largest public service broadcasters. It was the first to examine the value to children of such environments, and the first to study *Adventure Rock*, a virtual world which is free of directly commercial considerations.

The primary goal was to establish how children 'inhabit' and engage with immersive environments. This was done through half-day creative workshops with 90 children at BBC Cardiff, BBC Belfast, BBC Glasgow and BBC London in December 2007 and January 2008. The first workshop aimed to understand how children create imaginary friends and imaginary places in their 'real world' lives. This was expressed through artwork (drawing and collage) and group discussion. The second workshop aimed to find out how children explored *Adventure Rock.* In between the first and second workshops the children kept diaries which recorded their activities in *Adventure Rock* and other virtual worlds for children.

It should be noted that BBC Children's made available to the researchers a reduced 'beta' version of *Adventure Rock*, therefore many areas were not open for the children to explore, although a good enough number of areas were offered: Star Square, the drawing and cartoon studios, several games such as 'Bike Tangle', and a topic in the BBC Children's message board was opened to receive the children's comments or 'bug reports'.

The parents of the children were given a questionnaire to capture their thoughts on *Adventure Rock*, and virtual worlds for children; and finally whether their perception of BBC Children's and the BBC in general had changed over the period of the fieldwork.

Alongside this 'audience' study, we also interviewed and collaborated with the producers of *Adventure Rock* so that producer intentions could be compared with user experiences.

Findings

The position of Adventure Rock in the marketplace

Adventure Rock is not as sophisticated as many commercial services, but it was highly valued by the children. The children thought it was unique because it offers them a space 'outside' which they can explore; this is likely to be due to the reduction in the 'real world' outdoor areas in which today's children are typically allowed to play freely. The 'adventurers' would have liked to have competed against each other, but this was not possible within the world. The children who took part in the study were very excited by the 3D graphics. Only one other virtual world has comparable quality of 3D experience (*My Tiny Planets*). The children also liked the fact that *Adventure Rock* is free, with no need for payments or subscription. The children felt frustrated, however, that *Adventure Rock* was not available for Apple Mackintosh computers or via internet-enabled games consoles.

Skills for digital life

The researchers found *Adventure Rock* offers both educational benefits and other value to the children, for example by providing a place to develop transferable skills for adult life. More detail on the value of virtual worlds for children is given later in this report. The virtual world offered a first experience of immersive environments, where the BBC Children's audience can learn about more sophisticated virtual worlds and online experiences for children. *Adventure Rock* is seen as a suitable service for a public service broadcaster to launch, and an important service in order for the BBC to keep pace with external developments in media.

Collaborative and social interaction

Virtual worlds and immersive gaming environments for children offer chat and other collaborative activity. Children were disappointed by the lack of such important social features within *Adventure Rock*. We recommend BBC Children's is given more financial assistance by the BBC specifically to support the production and ongoing management of social and collaborative online environments for children. If BBC Children's is not given additional funding to enable the department to produce purely web-based public service content of similar social complexity to global commercial offerings, there is a business risk that the BBC will not (a) educate young audiences for digital social life and (b) the BBC may lose audiences aged between 6–12 years of age to commercial operators. It is clear that both children and parents expect CBBC to offer innovative and collaborative services online.

Producing virtual worlds for children

Virtual worlds and immersive gaming environments for children require different time-scales and more complex production activities than non-immersive media. The development period is typically much longer (two years or more), the beta test and launch is complex, and the world or environment must be both facilitated (moderated and hosted) and iteratively extended. The closure of a virtual world for children requires careful planning, and should be discussed as soon as possible after launch.

A different 'contract' with audiences

Virtual worlds require a closer relationship with audiences, and this includes co-production and co-management. The researchers recommend BBC Children's should consider ways in which children can be more closely involved, from the earliest point in concept development (not mere beta testing, when the production is almost complete). It became clear in the study that the producers need to inform children when areas are closed, under development or where there are any technical problems: a greater degree of transparency is required. Some children became frustrated, angry or anxious when it was not clear whether their inability to access some areas was a technical limitation, or their own fault. The relationship with audiences also involves rights and responsibilities for both the producers and audiences.

Peaks of motivation

The researchers found the children were highly motivated at particular moments during their exploration of the world, for example, reaching Rainbow Canyon or finding their first page. It is suggested that these moments be further identified as it would be a good time to introduce further quests or challenges. The children also expressed a wish to have acknowledgement from the BBC during these peaks of motivation, and to be rewarded for their achievement.

Identity

The researchers found the older children, particularly, wanted to have more say about their identity and more ways to express their persona. Some of the older boys and girls expressed a wish for more fashionable clothing and hair styles for their avatars. The Muslim girls in the study wanted to be offered a range of head scarves.

Differences in age

There were significant differences between the 7-9 year old and 10-11 year old players. The younger players wanted to have more orientation and help, and they were also happier to enjoy solo play. The older players needed to have social activity, more collaboration, competition, ways to express themselves and more challenges. The older

boys and girls wanted to have commerce (shops and trading) and to be able to compete against each other.

Principles for a successful virtual world for children

Thirteen principles to ensure a successful virtual world for children were identified by the researchers. These principles resulted from the 'geographical', social, economic, citizenship, motivational and emotional requirements expressed by the children both in the workshops with the researchers and during the time they explored *Adventure Rock* and other virtual worlds for children, on their own.

A different place for the audience

The nature of virtual worlds means the audience ceases to be 'out there', external to the BBC. The young players create their own experiences within the world and should be considered as co-producers. This may require a re-examination of the ethical and legal framework between the children and producers. Producers who are skilled at engaging with audiences should be perceived as having 'key roles'.

Partnership with parents

Most of the large, commercial, virtual worlds for children, enlist the assistance of parents. Parents are invited to open an account with the virtual world and to set the level of interactivity their children with have with others.

Benefits from the research study for the BBC

The research project brought direct, measurable benefits for the BBC:

1. Prior to the launch, BBC Children's commissioned an additional video to help children register and download *Adventure Rock*, based on comments from the children in the research project who specified the steps that they found difficult.
2. BBC Children's received much praise for bringing the industry and academia together to discuss virtual worlds for children, in the first dedicated conference on the subject. Some delegates travelled from Europe and the USA.
3. Industry and academia in Europe, and the USA and Canada have been given a greater awareness of the innovation work going on in the BBC, particularly in the area of immersive and 3D media.
4. Evidence of the value of virtual worlds for children, and therefore of the value to audiences of *Adventure Rock*, and any similar services which may be offered by BBC Children's or other BBC production departments.

5. Two in-depth reports on (a) virtual worlds for *children* and (b) virtual worlds for *BBC audiences in general* have been produced for the BBC from the study. The reports draw together existing knowledge for the BBC on the topic of Virtual Worlds as well as original findings.
6. An analysis of the current state of the market for virtual worlds for children is included in the research report for BBC Children's.
7. The collaborative research project has informed partnership arrangements for research undertaken between the BBC and the University of Westminster.
8. The findings from the research project are being disseminated widely for industry and academia, through presentations and papers.

Outputs

A conference for 300 delegates took place at the University of Westminster's Marylebone Campus, on Thursday 22 May 2008. The conference received coverage in the national press and generated a complete edition of *The Digital Planet* on the BBC World Service. It is believed this was the first time producers, academics and policy makers had gathered together to discuss virtual worlds for children. Papers and presentations from the Children in Virtual Worlds conference are available at www.childreninvirtualworlds.org.uk.

In addition, the researchers attended the following conferences and events to disseminate findings to both industry and academia:

- *The Virtual Economic Forum* (the first European conference on virtual worlds), www.virtualworldsforum.com, 24–26 October 2007. The researchers provided a week of blog entries on the topic of virtual worlds for children, leading up to the conference.
- *The Child and Teen Consumption Conference*, Trondheim, Norway, 24–25 April 2008. The researchers presented a paper on *Adventure Rock* to 200 academics that specialise in researching children's media.
- *Audiovisual Innovation*, Barcelona, 5 June 2008. The researcher presented a paper on *Adventure Rock* to 100 delegates from Europe interested in innovation in public service media. The conference was organized by the Catalonian Public Service Broadcasting Corporation.
- *Showcommotion,* Sheffield, 2–4 July 2008. One researcher chaired a panel composed of producers who had either launched, were in the process of launching or who were considering whether to build virtual worlds for children aged between 6-12 years of age. The preliminary findings from this research project were presented to the conference delegates.

- *Making Television for Young Children,* University of Westminster, 12 September 2008.
- *Youth-led Innovation in a Digital World,* NESTA, 30 September 2008.
- *Internet Research 9.0: Rethinking Communities, Rethinking Place,* Copenhagen, 14 October 2008.
- *PEACH, 'Presence: Present and Future Markets'*, Turin, Italy, 12–13 November 2008.

The researchers are also preparing two academic articles for publication:

- An article about the study and its findings, for the international peer-reviewed journal *Media, Culture and Society* (or similar).
- An article about new industry of virtual worlds for children, for the international peer-reviewed journal *Convergence* (or similar).

CHILDREN IN VIRTUAL WORLDS

Adventure Rock as a case study of a virtual world for children

The project aimed to establish how children inhabit and engage with immersive environments, using *Adventure Rock,* BBC Children's new virtual world for children aged 6-12 as the case study. *Adventure Rock* is one of a suite of new services which provide new kinds of creative environments for children. The 3D virtual place offers exploration, gaming and studios (for the creation of music, cartoons, animation, video, dancing, and 'inventing things'). The children collect coins which can be swapped in the 'Upgrade Centre' for new clothes for their avatar or new equipment for Cody, a friendly robot who accompanies them on their journey. The children also find pages from a book and strange hieroglyphics which may, in time, begin to explain the mysteries of the *Adventure Rock* Island. External to *Adventure Rock* is a website which offers a gallery for the children to show their work, and a message board which enables moderated conversation between the players.

90 children aged between 7-11 from ten schools in Scotland, Wales, Northern Ireland and England participated in the study, with the support of the class teachers, many of whom became very involved in the project. The five workshops from ten schools with a total of 90 children gave a sufficiently robust and varied sample to produce good quality qualitative data and a small number of findings from quantative data (from the questionnaire for parents for example). The researchers have cross-referenced any quantative findings with supporting qualitative data where possible. Research workshops took place in December 2007 and January 2008 with five mixed socio-economic and ethnic groups. In the first workshop children were encouraged to talk about and illustrate their imaginary spaces and friends (if they had one when they were younger), and to suggest what they would like to see in a virtual world. The children had four weeks to explore *Adventure Rock* in their own time, and keep diaries. The second workshop began with a discussion on what the children's felt about *Adventure Rock*, and any other virtual worlds for children which they had visited over the Christmas break. They drew and mapped out what they had felt were the significant objects, places and things in *Adventure Rock*, explaining what they would add, remove or change if they had been the producers. (These creative and reflective methods are discussed in Gauntlett, 2007).

The parents of the children were given a questionnaire asking them to say what they felt about the world and any other virtual worlds their children had visited; the parents were also asked whether their perception of BBC Children's and the BBC had changed. Finally the researcher spent time observing the *Adventure Rock* production team and attending industry events to gather information about the industry.

Imaginary friends and imaginary places

The researchers were surprised to find that between half to two-thirds of the children had had an imaginary friend when they were younger. Often the imaginary friend would come when the child was upset or angry, or they were a caring friend who was always there, "I can't remember his name, but he used to stay with me and when I was lonely I could play with him" (boy, 9, London). The imaginary friends were likely to be a reflection of the child themselves, aspirational (how 'I would like to be'), or have superpowers (hypnotic powers, lasers, able to fly, a fairy). In several cases, one or two children in each group, there were children who not only drew their imaginary friend, but who further articulated this by drawing the land their imaginary friend inhabited.

Half of the children from Glasgow, Belfast and Cardiff had created an imaginary land when they were playing. One boy created 'Stick Land' (boy, 11, Glasgow) and he spoke at length about how he had kept a notebook which documented how Stick Land grew over several years, as he added new areas and objects. Another boy (boy, 10, Belfast) continued to describe his imaginary land (which was on Mars and in the future) throughout the first workshop, returning to the subject repeatedly. 'Ryan's Land' appeared in his dreams several times and it was highly complex with rules, pets of the future, a metal horse, a robot, and a perpetual motion machine. The children were at first reluctant to talk about their imaginary friends and places, but once the researcher had told them about her own imaginary friend and imaginary places, when she was young, an animated discussion took off, which lasted for over half an hour. The discussion felt like an exchange of secret information and the children gave often very vivid descriptions.

The imaginary lands appeared to be a mixture of something which was physically created, for example in the garden or living room, or internally created in the child's imagination. One or two children in each group had created imaginary places with other children, often with their siblings, "I did with my brother; we made lots of papers and stuff, like a paper factory and we put stuff in" (boy, 10, London). Several children in each group described how they had used objects in their house, "We put duvets over the kitchen table…a big monster came to get us" (girl, 8, Belfast), or "We put pillows on our trampoline" (girl, 9, Belfast). The children who described an ongoing imagined world (shared with others) felt it was important to "keep it in the same place and [have] the same things. Say if you had a place and next time it was completely different, you'd have to keep things the same" (boy, 8, London). In other words, they often used the same furniture, props or costumes to help the continuity. It was considered important to "always have an escape route" (boy, 7, Belfast), to make it comfortable, and to protect the imaginary place by having "boxes on the front" (boy, 8, Belfast) or "walls to keep people out" (girl, 8, Belfast).

Imagining worlds

During the second half of the first workshop the children were asked to draw their ideal imagined world. Certain themes kept appearing, such as a place to live, shops, beaches, a swimming pool, hotels for the avatars. It was important to have good transport, for example a motorbike or space shuttle; all transport would need to be super-efficient, for example being able to go to London in 40 seconds. A few imaginary lands reflected the children's own lives with one or two children in each group drawing their own worlds, their school, the city centre; often augmented by things they would like to see there such as a circus or playgrounds.

A high percentage of the children wanted to draw an imaginary land made of chocolate (35 per cent of the children in London). This may be a reaction to the movement for healthy eating which has been in evidence in schools and the media coverage on obesity influencing the discourse around children's diet. Several of the children created worlds labelled for children only, for example, 'Kidsland' and 'Kids World': "Everything in there is unhealthy; there is lots of chocolate and candyfloss" (girl, 11, Belfast). A second strand of 'rebellion' was to draw a world where there was a place for parents but also some means of keeping adults away from the children's part of the world. One girl drew 'KidsZone': "There is a force field between them. Parents can't see what the kids do but the kids can see what the parents do" (girl, 10, Belfast). There was evidence too of the concern children have about the environment or world issues. One child said in his land "If you use too much electricity, half the planet goes off" (boy, 7, Belfast). Another child drew a complex world of triangles, containing refugees from another planet, and a space station and space ships.

The *Adventure Rock* beta test

Firstly, it must be noted that the research project tested a beta version of *Adventure Rock*, which had limited functionality, and some bugs on download. Because of the technical complexity of integrating *Adventure Rock* into the BBC the testing period had to be extended. Therefore the fieldwork due to begin in July was eventually able to proceed in December 2007. In addition, the children were given an incomplete beta of the world to test at the beginning of December. The producers worked hard to ensure there was enough of the world for the participants to explore by January. However, it must be noted that the children faced considerable difficulties in accessing, downloading and moving around the world during the fieldwork stage of the research. The study was to include an analysis of the elements of *Adventure Rock* outside the world itself, but the main *Adventure Rock* website launched too late to be included in the fieldwork, so the workshop children were not able to access it and comment.

The areas available for the children during the study were the tutorial, Star Square, the upgrade centre, the music studio, the cartoon studio, the drawing studio, Rainbow Canyon, and the CBBC studio. Some of these areas weren't open until January, therefore several children gave up playing *Adventure Rock*. As new areas opened the children got very excited: one girl wrote in her workbook: "I love the changes you have made in *Adventure Rock*" (girl, 8, Cardiff). As the research project went on, more areas and studios opened, and there were fewer bugs. However, several children in each group were not able to access *Adventure Rock* at all, but most were able to log in and explore for enough days to produce adequate and representative data.

Some of the children's problems were due to technical issues, many of which were resolved as time went on. Some 'technical' issues are going to remain: for example the size of the download seemed to affect some family computers, with one girl reporting, "Since I've been playing the game everything on my computer is very very slow". Obviously the fact that *Adventure Rock* doesn't work on Apple Macs is an issue. One school had to withdraw from the project as they were 'Mac-based' and couldn't find enough PCs for the children to use. Most of the schools wanted to give children who didn't have computers at home the opportunity to take part in the research by allocating time in the school day for *Adventure Rock*.

FINDING

The fact that *Adventure Rock* doesn't work on Apple Macs was an issue. One school had to withdraw from the project as they were 'Mac-based' and couldn't find enough PCs for the children to use.

Being outside

The children in the research project were in almost universal agreement that *Adventure Rock* was different from other virtual worlds because they liked exploring 'outside'. 80 per cent of the children in all the groups said they liked being on a quest in the 'outdoors'. One girl said: "I like the freedom provided in the game, it was really great being able to move around freely. I loved all the obstacles such as the walls, the tubes and all the big blue platforms you came by while exploring *Adventure Rock* (...) I like all the rivers in *Adventure Rock*, they add a nice touch to the scenery" (girl, 11, Glasgow). The children often recorded their experiences in great detail for the researcher, for example:

"On my second day of *Adventure Rock* I was quite confident when opening the game (...) I saw something unusual – a tunnel was open! When I came near it Cody kept on saying he wanted to go into the tunnel! So off I went, to the tunnel, and it looked like if

it (sic) was a really long tube! (…) After a lot of jumping (which I probably did a thousand times by now) I had to go through a moving tunnel! It was quite hard, but I managed to do it. After jumping again, I saw rainbow. I ran at it and my character started to run on the rainbow! It was awesome" (girl,11, London).

FINDING

The children felt that what made *Adventure Rock* special for them was the sense of being 'outside'. This may be due to the reduction in unrestricted access to the (real) outside world.

Tim Gill, author of the book *No Fear: Growing up in a Risk Averse Society*, noted "In 1971, 80 per cent of seven and eight year olds went to school on their own. By 1990 just nine per cent did. Again, in 1971 the average seven-year-old was making trips to their friends or the shops on their own. By 1990 that 'licence' was being withheld until the age of 10. So, over a single generation, children had lost up to three years of freedom and mobility" (Gill, 2007).

Being an Adventurer

A small number of children in each group seemed to enjoy being explorers or investigators, and as the two months progressed, they appeared to have assumed that specialist role within their group of peers. A typical investigator's comment was: "Today I played *Adventure Rock* and I found something on the ground. It looked like a compass with a moon inside it. I found it near Raptor Forest" (girl, 8, Cardiff). Another girl described (in the workshop discussions) how she had found a pterodactyl, a boy described how he had found a strange symbol which, he explained, he had also noted down in his workbook believing it to be significant. The mystery of the game was exciting: "You have to jump on things and crawl and so it is an adventure and explore. I like it when you explore, it is fun" (boy, 7, Cardiff). The children felt some sense of physicality expressed through their avatars. "I like my character because she is cool and she does somersaults" (girl, 10, London).

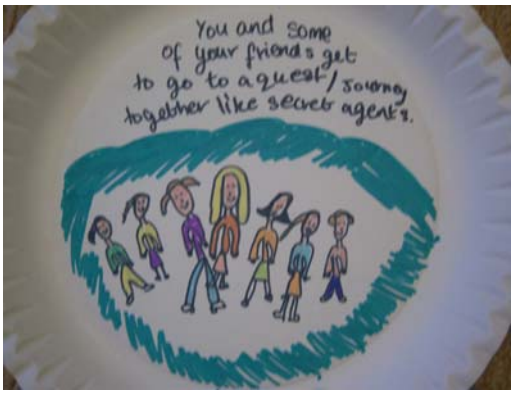


Figure 1 "You and some of your friends get to go to a quest/journey together like secret agents"

When the children found objects they appeared to get a real sense of achievement: "It is really fun when you get to know what you have found, like finding a book page. AND I totally love the bit where you get boosted to the next level" (boy, 11, Glasgow). The children felt they learnt skills in *Adventure Rock* which helped them to explore the real world; one child explained how *Adventure Rock* teaches you "how to get home safely" (boy, 7, Cardiff). Although the children were confused about what the quest or adventure was, they were excited to be involved: "Sometimes I get bored of the game, because you just go and collect the coins, but on the other hand, it can be very exciting. To me I think the game is exciting, fun, excellently designed, phenomenal, and a lot more. I think *Adventure Rock* is a good name for the game because you are on an adventure" (girl, 11, London).

Being social

The children didn't feel alone, as such, in *Adventure Rock*, although they noted that they were basically on their own. They felt the robots, crocodiles and Cody kept them company: "I found Cody, my robot friend" (boy, 7, London). One or two of the children had noticed that you could chat to Cody, but most were confused how the 'chat to Cody' tool worked. Only one or two children mentioned the Link Bots, which indicates a need to give them more character. A few of the younger children (7-9 year olds) preferred being on their own as there was less competition and they wouldn't need to 'share' anything, but some of the other children began to construct ways of playing with other children. One girl wrote in her workbook how she played *Adventure Rock* on Christmas Day with her family: "My brother and sister and cousins love it." Another child wrote that her younger brother often watched her play: "My brother wanted his own username and password, because he thought that the game was amazing. And he said that he wants to be one of the next bunch of people who try the game out." Another girl said the same thing: "My brother Thomas, who is four, really enjoyed watching this game with me and got really excited when I was chasing Raptor" (girl, 8,

Belfast). The Glasgow children formed a club and went round to each others houses to play together, particularly if one child was experiencing a problem or was finding one of the levels hard.

The Cult of Cody

The 'cult of Cody' had developed by the time the researcher returned to meet the children a month after the first workshops.

Figure 2 Cody (7-9 year olds, London workshop)

He was perceived as a real friend by many of the children and he appeared in 15 per cent of the children's drawings. The researchers felt that there was some correlation between the children's imaginary friend and Cody. Right from the first moment the children enter the world, he is obviously there. A typical experience was that: "At the beginning I didn't know what to do, so Cody told me I had to get the tokens. He said press a space bar to jump and the shift key to crouch" (girl, 10, London). Almost all the children said Cody was helpful, useful; referring sometimes to 'me and Cody'. There were some negative comments too; "He is always following you just like a bodyguard. And sometimes he gets on your nerves by saying the same things over and over again" (girl, 8, Cardiff). Several children wanted to change Cody's voice which they said was 'irritating'.

Many children had ideas for improvements to Cody:

> "I think he should update me with how many points I have and remind me what I can do with them e.g. 'Enough points for the ski lift now!' I could change Cody's gloves an eye colour too at the Upgrade Centre to different colours. Also Cody could give tips in places where I am stuck. Also Cody should give the story of *Adventure Rock*. Why is he there? Why is the avatar there alone? What is the floating island? What happens when I finish *Adventure Rock*? Will there be other levels?" (girl, 10, Glasgow)

Cody and the Upgrade Centre are linked; the majority of the children liked saving up coins and using them to buy upgrades for Cody. But they would also like to be able to change more things: "Maybe you can have two Cody's that you can choose at the beginning. Cody 1 could be a boy and Cody 2 could be a girl. [An image of 'Collie', Cody's sister is drawn in the workbook at this point] Collie is fun, happy and has a great laugh" (girl, 11, London). One child thought it would be good to be able to switch Cody so that he spoke in other languages.

The crocodiles

The children had mixed feelings about the crocodiles. Some children found them a bit frightening: "It was very scary when the crocodiles lifted the hose and water sprayed out" (girl, 10, Glasgow). Other children loved the crocodiles: "When I got the paper the croc came and got it and show a funny face at me then ran. He ran fast. I can't catch him because he disappear, it hide quick" (boy, 8, London). Almost all the children enjoyed playing Bike Tangle with the crocodiles, but universally they felt it was unfair that the crocs had four lives and they only had three. This was a serious fault in the game for them; and this need for 'fair play' surprised the researchers.

Being creative

The children liked being creative in *Adventure Rock*, in particular the music and drawing studios, but 'being creative' seemed to begin, for the children, with creating their avatar: "I got to design a character" (girl, 7 London), "It's good making the avatar" (boy, 8, Cardiff). The music, drawing and dance studios were very popular. One or two children wrote about the cartoon studio in their workbooks but it appeared to be slightly less popular. A typical comment from the workbooks from a girl who is playing together with a friend, sharing the same avatar:

> "We reached the drawing studio, where a robot girl was standing at the front asking us if we wanted to go in or not, and I said yes. At first it was really hard and a bit annoying sometimes. But as I got the hang of it, I done a great picture with a boy, a rabbit, a bean bag and a spotted rug. Saving was a bit hard to do but I got it in the end. Next there was a music studio where a robot boy was waiting outside asking us if we wanted to go in or not and I say yes and it was reallllllllly cooooooool. I made my music and it was greeeeaaaaaat!!!! When I played the music me and my brother danced a little bit. But it really sounded like a real song. Anyways, that's all I played but it was amazing. I love the music studio" (girl, 9, London).

Some of the children managed to create whole pieces of music in the music studio; one child, who said they played an instrument, said: "The music studio was the best. I've

made three songs a classical song, a beatbox/rap song and rock song and they all sounded great. But I forgot to save them into Cody's save file and then I quit so I'll have to make up some more songs with the instruments" (girl, 10, Glasgow).

Many children reported, during the discussions in the second workshop, how they had almost universally forgotten to save their work once they had finished it. Several children said this left them feeling frustrated, and, in one or two cases, as if they had 'failed'. One parent noted that her child: "Didn't really need any assistance except when trying to save their work – I was unable to help unfortunately!" One boy wrote in his workbook, "I really, really, honestly like this place because you can make your own music there. I LOVE THIS PLACE" (boy, 9, Cardiff); the statement was accompanied by a screen grab of the music studio. One of the older girls wrote in her workbook "I'm very keen on art, so I did lots of things in the art studio. The only thing is I keep on forgetting to save it! I coloured in some of the pictures. It has been a great day today" (girl, 11, London).

During the discussions in the second workshop, and in their workbooks, the children expressed how much they would like to be able to change things in the world: "One thing bothered me is that you couldn't design Cody like you could with the avatar." (boy, 8, London). They would like to be creative *with* the world.

Status: How am I doing?

Status within the world is obviously expressed in different ways, through collecting coins and pages, progressing through the levels and through knowing about the game; being an 'elder' (Jo Kim, 2000) or a 'power-user'. The researchers identified power-users in each group, who typically revealed themselves with statements like: "I now have over 31,000 tokens and 50 pages (...) I enjoyed *Adventure Rock* at first but it gets boring when you have to go over the same areas time after time. Access to new areas would be more interesting. I thought I would get access by collecting 50 pages, but I didn't" (girl, 8, Glasgow). Power-users would test the systems as much as possible, and were keen to show others their knowledge in the public forum of the second workshop.

FINDING

Children wanted to be able to compare their performance and perhaps compete with each other, but they are unable to do this in *Adventure Rock.*

Many of the children wrote down their scores in their workbooks, which shows how important it is to them that their progress is documented, stored for retrieval. One boy from Cardiff (aged 7) carefully documented the number of pages he had collected (24), the number of coins he'd collected (407), and his score (8946). Another child wrote: "I had 292 tokens and 24 pages but it wouldn't start the rollercoaster. It was very annoying" (girl, 10, Belfast).

The children wanted CBBC to acknowledge how well they were doing, and other children. There was some sense of wanting to perform for CBBC. This may have been due to the fact that the workshops were in BBC buildings, but this was also a natural expression of wanting to know how they were doing in the world: "I am very disappointed and tired. I think you should reward the player when they find all the tokens because it was hard to get them all especially in the underground tunnel and at the end finding the last one" (Girl, 10, Glasgow).

It is important for children to be able to compete against each other but they are unable to do this in *Adventure Rock.* In a sense they are able to play against the crocodiles, and the children enjoyed 'Bike Tangle', but felt they were not rewarded for beating the crocodiles.

Mission and motivation

There is some evidence the children began to lose interest after they had explored all the areas open to them, there was a 'decay'. This particularly applied to the 'Power Users': "Its fun creating stuff but you can lose interest. It's not interesting enough and not something I would do that much. There's not enough action" (boy, 11, Cardiff)

One of the girls said in her workbook "I've been playing on *Adventure Rock* for the last few days but haven't written about it because I haven't found anything new" (girl, 11, Glasgow). A similar comment from a girl of the same age in London: "Sometimes I get bored of the game, because you just go and collect the coins, but on the other hand, it can be very exciting. To me I think the game is exciting, fun, excellently designed, phenomenal, and a lot more. I think *Adventure Rock* is a good name for the game because you are on an adventure" (girl, 11, London). A production tip from the one of the children: "The plus side on Cody is he makes sure you are still interested in the game" (girl, 11, London).

FINDING: Peaks of motivation

The children had 'peaks' of excitement, which would result in increased motivation, for example:

1. **When they first explored the world**
2. **When they first play 'Bike Tangle'**
3. **Going down their first tube.**
4. **Reaching Rainbow Canyon**
5. **Swimming in the river**
6. **Finding their first page**
7. **Finding a strange symbol**

Orientation: Where am I?

The children needed several different kinds of orientation, for example, to know where they were located in the world, who was contacting them, and how they were doing. One boy said: "Cody shows me my *Adventure Rock* map and gives me all my scores and messages" (boy, 11, Glasgow). The children also wanted to know where they were in the narrative of *Adventure Rock*. During discussions in the second workshop they reported that they wanted to know why they were collecting the coins and pages. The children felt they should be given some idea of what the quest was in order to increase their motivation for playing the game. One boy said, "I'm not sure what to do, I've gone in every studio, gone back to redo the tutorial, gone down the rainbow canyon tube" (boy, 11, Glasgow). One girl wrote out a bulleted list for the producers, in her workbook with the words:

"IMPORTANT I do not understand

- Pages
- The point of the game
- How to gain access of other places
- Unblocking stuff
- No signposts
- Why is save icon not working?" (Girl, 8, Glasgow)

The cheats were seen as very helpful, particularly for the younger children when they got stuck and didn't know what to do: "I learned me how to do the cheat (...) I went to the cheat and you get much faster" (boy, 8, London). Some of the older children found them useful too: "It is a good idea to have a cheat. You can go to the cheat more than ONCE which is really helpful" (girl, 11, London). The researchers found there was greater use of the cheats in some groups then others; the Glasgow children, who were

'achievers' didn't use the cheats as much as the other groups. The children seemed to pass on the knowledge about the cheats to each other.

Humour

The workshop participants liked the fact that Cody told jokes and had a slightly irreverent and cheeky attitude towards the robots and crocodiles: "Cody is really mean to the other robots and is so self-centered because when you pass the upgrade centre he says "yeah, stuff for me" and to the robot he says "I think you could do with an upgrade, pal" he should be more kind" (boy, 11, Glasgow). The children in Glasgow began imitating Cody towards the end of the second workshop; evidence of a shared and mutually enjoyed culture. Humour seems to also motivate: "This game was quite hard and I kept losing lives. It was also quite fun because of the noises Raptor made and his voice made me laugh! My brother Thomas who is 4 really enjoyed watching this game with me and got really excited when I was chasing Raptor" (girl, 8, Belfast).

Help with the technology

Apart from knowing where they were and knowing the purpose of the world, the children also needed several different kinds of help, firstly at the point of entry (download and register), secondly when starting to play the game, and particularly with the moving platforms. The tutorial was seen as helpful, however, once the tutorial had been completed, often the children didn't know what to do next: "I first arrived at the tutorial and I thought it was good to get to learn all the controls. Once I had completed the tutorial I didn't know what to do next, so I think that you should add some instructions" (boy, 10, Glasgow). Another example from one of the older girls from London: "At the beginning I didn't know what to do, so Cody told me I had to get the tokens, he said press a space bar to jump and the shift key to crouch" (girl, 10, London). One of the most frequently cited sources of help was Cody:

> "I found Cody quite good because you could always save things OR copy things that you wanted to save or copy. He also told everything to you, things that you needed to know, but in other games and websites they will tell you all these rubbish things you don't need to know at all e.g. you are going to the next level in one second. That is so boring" (girl, 11, London).

Another girl supported this in her workbook:

> "I think Cody is very useful to use. He is very helpful and I am glad you put Cody in the game. He tells you all the keys to use so you don't have to figure them out yourself, like on some CBBC games you have to. He helps to explore with you around *Adventure Rock*, he likes to explore (sometimes Cody can be

annoying). I liked it when you found the machines to improve him, upgrade" (girl,10, Cardiff).

Once the children had begun playing the game they seemed to find the first level fairly easy, however the younger children and many of the older children found

Adventure Rock increasingly difficult to use as they progressed through the levels: "I like the way the levels are designed. *Adventure Rock* is so fun but it is really hard to go on to the next level. And it shouldn't confuse you so that like you can go somewhere except for just going all the way round and find some papers and some coins and come back from where you started. So I'm not being harsh but I just want to go ahead" (girl, 11, London).

One of the things the children found most difficult in *Adventure Rock* was jumping onto the moving platforms: "It is really hard to jump on to those moving parts. I have tried really hard but it just doesn't work, I spent about 6-7 minutes on that" (girl, 11, Glasgow).

Video

The children said, in the discussions, that they saw video screens in *Adventure Rock*. One or two children described having seen video clips from CBBC being played on the screens at times during their stay there, however other children seemed to think this was the product of the imagination as the other children were unable to verify this. One girl said, "I saw the statue of the girl with the pink hair. I also saw all the display boards! They were cool!" (girl, 11, Belfast). Another child drew his avatar watching one of the screens during the second workshop when the children were asked to draw things they felt were important (significant) in *Adventure Rock*:

Figure 3 Avatar watching one of the big screens (London, 9-11 year olds workshop)

When questioned further on whether the children found the idea of video screens in the world exciting, the response was a definite 'yes'. A number of the children in each group

also thought it would be good to show children's work on the screens. All the children felt they would want to watch clips on the screens, if they wanted to watch a whole or longer programme, they would go to Cinema Island (or watch the television).

Having a 'home'

10 percent of the children drew a home (cottage, tent) or hotel for their avatar during the second workshop when they were asked to draw something they would like to see in *Adventure Rock* if they were the producers. The girls often drew houses or bedrooms and the boys sometimes drew dens or tents:

Figure 4 "A Normal Cottage" (From the London 9-11 year old Group)

Shops

During the first workshop, the children both discussed and drew what they wanted in an ideal virtual world. A significant number of the children wanted to have shops and ways to buy objects and gifts, for both their avatars and for other children they would meet in their worlds. The coins in *Adventure Rock* offer one means of accumulating wealth and the children enjoyed collecting them; however one of the most popular elements of *Adventure Rock* was the Upgrade Centre. One eleven year old girl wrote in her workbook, "After picking up loads and loads of coins, I found an unusual building. I went to it, and found out it was the upgrade centre. Then I realised that I could buy stuff for my character! So then I bought new shoes and shirt for my character." The researchers concluded the Upgrade Centre was fulfilling some of the needs of the children who were interested in commerce and commercial activities. This was seen as being a 'rehearsal' activity, for adult life in the real world.

Being rebellious (away from adult rules)

Several children in each group drew a placed for adults in there designs for their 'ultimate world'. In all cases the child drew a line between their world and the place where their parents could go. The researchers concluded that this was an expression of children beginning to run their own lives, but needing parents to be located nearby. Some of the children said their parents would be allowed to see what was going on, but the force field or transparent wall would not let them interfere.

Identity

All the children liked creating their avatar, but they wanted to do more: "I think I should know what my name is or at least make my name up" (girl, 8, Cardiff). The items on offer for the avatars were not seen as fashionable enough, "The girls outfits could be a bit better they're a bit yuck" (girl, 11, London). The boys also wanted to look good, with one boy commenting that the hair styles made the male avatars look "like freaks" (boy, 11, Glasgow).

The children thought there should be more on offer for their avatars generally: in one particularly interesting point, it was suggested that Muslim girls should be able to choose head scarves. There was some gender swapping; one girl (aged 11) chose a boy avatar. In the same way some children drew their imaginary friend as an extension of themselves, some of the children made the avatars look like themselves.

FINDING

Older children in particular felt that it was important that their avatars reflect their own interest in and awareness of fashion. Cultural differences should also be considered: two of the Muslim girls argued that they should be offered a choice of head scarves.

Eight orientations to *Adventure Rock*

The research study found the children had eight 'orientations to' *Adventure Rock*;' explorer-investigators, social climbers, collector-consumers, life-system builders, self-stampers, fighters, power-users, and nurturers. Other immersive environments for children and other virtual worlds may show similar 'types':

Explorer-investigators

- ***Interested in:*** Following a quest, solving a mystery, going on a journey, being 'outdoors'
- ***Likely to be:*** The more confident children, no age or gender difference
- ***Characteristics:*** Examines the detail, curious and communicative, imaginative engagement with the mystery

Self-stampers

- ***Interested in:*** Presenting themselves in the world
- ***Likely to be:*** Both genders, possibly more older children
- ***Characteristics:*** Boys and girls wanted to 'make their mark' on their avatar, and perhaps have their own face on there; older girls wanted dress her up and have a make-up studio in *Adventure Rock*. Both boys and girls wanted to express themselves through the creation of a home/base

Social climbers

- ***Interested in:*** Ranking, social position within the environment
- ***Likely to be:*** Both younger and older children; only some gender bias (boys slightly more than girls)
- ***Characteristics:*** Competitive; concerned with ranking and exhibiting that ranking to others

Fighters

- ***Interested in:*** Death and destruction, violence, and superpowers
- ***Likely to be:*** Male, slight bias towards older boys
- ***Characteristics:*** In *Adventure Rock*, frustrated that they did not have a means to express themselves, with the exception of beating the crocodiles

Collector-consumers

- ***Interested in:*** Accumulating anything of perceived value within the system
- ***Likely to be:*** Older boys and girls
- ***Characteristics:*** Collects pages and coins. Wanted *Adventure Rock* to have shops, enable *gift-giving*, establish an economic system, and have somewhere to put things

Power users

- ***Interested in:*** Giving everyone the benefit of their knowledge and experience
- ***Likely to be:*** Expert in the games, the geography of the environment, the systems
- ***Characteristics:*** Spent more than three hours at a time playing/exploring *Adventure Rock*. An interest in how the game works

Life-system builders

- ***Interested in:*** Creating new lands, new elements to the environment, populating the environment
- ***Likely to be:*** Younger children (imagined worlds without any rules), and older children (imagined worlds with rules and systems – houses, schools, shops, transport, economy)
- ***Characteristics:*** In *Adventure Rock*, frustrated that they did not have a means to express themselves

Nurturers

- ***Interested in:*** Looking after their avatar, and pets
- ***Likely to be:*** Younger boys and girls, and older girls
- ***Characteristics:*** Wanted to meet and play with others. Wanted to teach their avatar to swim, and somewhere for the avatar to sleep. Wanted pets to look after

The children who followed these orientations (and it should be noted that some children are likely to have composite orientations), were also likely to have varying degrees of sociability. For example, life-system builders are highly likely to need other players to organise into social systems, social climbers need to be able to meet others in order to both demonstrate and measure their status. Explorer-investigators and collector-consumers might be very happy undertaking solitary activities within the world or immersive environment for much of the time, however, at some point even they are likely to seek out others to show their collections or tell their stories to.

The researchers found there were slight differences between many of the younger children and some of the older children, however it was also noticed that some of the younger children were either very mature and/or were more confident or power-users and some of the older children were less mature and/or less confident.

Younger and older adventurers: some differences

The main problem for the younger, less technically able, or less confident children was progressing up the levels in *Adventure Rock*, however they found the cheats very helpful and liked the map and tutorial. Some children also said Cody was very helpful, and they suggested Cody might be able to offer them help at the point of action, i.e. when they needed it. When they had made a significant leap forward, for example, from one level to another, the children were very clear they wanted their progress to be rewarded.

FINDING: 7-9 year olds

- **They were happier to be on their own, but also wanted to meet other children.**
- **More help with navigation and orientation.**
- **More help with the games and studios.**
- **Acknowledgement and rewards.**
- **Much more free with their imagination, fantasy is good.**
- **Fewer need to follow logical rules.**

FINDING: 10-11 year olds

- **Needed a reward when they had 'done everything'**
- **More likely to get bored.**
- **Wanted to chat, swap, show, lead, create, and have some control.**
- **Wanted commerce and social structures.**
- **More likely to want to 'transport' to different parts of the world.**
- **Wanted to role play adult activities (running a shop, a kingdom)**
- **Keen to show their expertise, sometimes very competitive.**

The older, more able and more confident children were more likely to pursue the quest and enjoyed the adventure side of *Adventure Rock*; they were also more interested in the commercial and competitive side of the game/world and much more likely to want to meet and engage with other children within the shared space. The younger children were more likely to need help downloading and installing the game.

Children as citizens of *Adventure Rock*: The need for transparency and fair dealing

All the children strongly believed that if areas were closed they should say why they were closed; it was felt that the producers were not being fair with the children, who assumed they were doing something wrong. On occasion one or two children reported they had been extremely upset by not being able to get into a section of the world, with one child writing in her diary that she had cried all night until she had fallen asleep. One girl (aged 11) said "The thing is I can't go to the rollercoaster or the mountains! That's so unfair!" A parent commented "I think you would also benefit from watching how children play the game and see how frustrating it was to be faced with a map of exciting places, but be unable to open them." Many parents also commented on this. We would like to stress this finding as highly important; treat your testers with respect.

One parent commented in her questionnaire how her child was "Completely de-motivated by lack of access to the locked areas of the virtual world." A second parent described how his child had "Spent a lot of time trying to gain access to the rollercoaster, ski slopes, Cinema Island, animation studio, etc. As her parent I was frustrated being unable to help her gain access to the areas which might have benefited her." In the second workshop it became clear 80 per cent of the children had been frustrated that there were places in *Adventure Rock* which they could see, but not get into; the children discussed this at length in all the groups. It was felt the producers should put up signs to let everyone know whether an area was open, closed, whether there was a technical problem or whether an activity (such as collecting more coins) was required. This should be noted as a significant finding; the children want to be kept informed, and their expectations should be carefully managed.

Producing *Adventure Rock*

The researchers, and the children who participated in the study, strongly feel children should be involved in the development process from early on as it would then be possible to make adjustments to suit children's behaviours and reactions to the environment before launch. There was value in undertaking a study with some two months longevity as the researchers were able to track, to some degree, the level of engagement with *Adventure Rock* over December 2007 and January 2008, which showed which factors were high motivators for different types of children. However, it is obvious producing virtual worlds for children is a highly complex activity. A selection of points to inform the development of future immersive environments by BBC Children's:

Pre-Production:

- The importance of working with children to scope the project
- Work with children to check the overall design
- Consideration should be given to how children could work with the production team on an ongoing basis. The position the children are presently in should be changed from 'consumers' or 'audience' to 'co-producers' and 'experts'.

During production:

- More thought should be given to the elements of *Adventure Rock* which will sit outside the 'membrane' of the game and how children would move between the 'in game' and 'out of game' content.
- There should also be some cause and effect between the site and the world. Both the world and the website should reflect each other, on a daily basis.

Beta testing:

- Check the Beta test procedures with a group of child testers.
- If any areas are not going to be open, say they aren't open and why.
- Tell the child testers when new areas are going to be open for testing, so they can give their reactions.
- If a message board is provided for Beta testers, have both a technical AND editorial discussion, as the children want to talk about both the bugs they find and about the game structure itself.
- A sociable element should be provided from the beginning so children can chat to each other about the game and swap content, even if this is only a Beta test; the children will be much more motivated that way.
- The formation of a culture is an important as the number of visitors, and ideally, time should be given to the formation of a living culture before launch.
- It is very important to track behaviours over-time, a one day user-test is not good enough for environments where there is some notion or element of ongoing 'habitation' or colonisation.
- Involve the children in the testing of registration and download and ask them what is going to help younger and less able children – they come up with great ideas.
- Prioritise the elements of the world where the children can see they are having a direct affect on the world e.g. user-generated content, galleries, and any associated social elements.

Post-Launch:

- Inform the Beta test children what will happen to their log-ins once the final version of the immersive environment has launched.
- The researchers are aware there is a forward plan for opening additional areas and providing more games. This plan could be shared with the children.
- Plan for the closing of the world. Disney faced problems when closing *The Magic Kingdom* (May, 2008), and it caused both children and parents distress.

FINDING

The children wanted to be kept informed of any technical problems or bugs. They would then have understood why certain things were not working or why some areas were closed. The children wanted to know how their 'bug testing' was helping the BBC Children's producers. They were extremely proud of being given the job of testing *Adventure Rock* for the BBC and for other children.

Production: General points going forward:

- Consider whether some children could act as helpers, showing new children around as they register and answering repetitive 'Q and As' in the message boards.
- Involve the children in the iterative development of the world, for example, the evolution of new games, or the choosing of content to go into the galleries.
- Acknowledge children's content either automatically or actually, when they send it in.
- Encourage ideas for the extension of the world and keep children informed of the viability of incorporating new ideas. The children in the research workshops understood some things couldn't be changed, but they wanted to be kept informed.

FINDING

The children wanted to be involved in the ongoing development of *Adventure Rock*. They understood some things were not possible, but they felt they could help other children get started, perhaps organise events in the accompanying message board, or even make short videos to be shown on the video screens in the world.

The children offered the researchers what could be termed 'production notes' for the producers of *Adventure Rock*, which we pass on in this report. One of the biggest issues was access to the game; *Adventure Rock* is not available on Apple Mac, or games consoles (such as Playstation or Xbox). The children also wanted *Adventure Rock* to be portable, which may be due to having to share computers with other siblings, not having a computer in the bedroom, or not having a computer at home.

Almost all the children wanted to meet and chat to other children, and to swap content; they also wanted their content to be acknowledged by the BBC. Predictably, all the children wanted to have 'more stuff', that is more areas to explore, more clothes for the avatars, games, characters to meet and so on.

The children were keen to expand the elements of the world which might give more moods or emotion, for example, sounds, music, and weather (rain, sunshine and shade). One child said "Let there be music in the background. It's really quiet and dull." Another child commented, "I think (...) some of the levels can be dark and mysterious and some could be bright and have a happy setting."

Finally, the children had advice for producers on the game controls, one girl (aged 9) said, "It would have been easier if the controller for the games was the mouse rather than the keyboard keys." Another girl (aged 11) thought there should be "a button that says 'exit', you also need a 'save' button, after you press 'escape', that could be handy."

The parents' views of virtual worlds, *Adventure Rock* and the BBC

BBC Children's was keen the researchers undertake a survey of the parents thoughts of CBBC and of the BBC in general, with particular reference to *Adventure Rock*. Of the 90 questionnaires which were sent out just over 50 per cent were returned from the parents of the children who took part in the research study. 13 questions were asked (see Appendix) and there was an additional space for parents to give comments.

29 comments were positive. "Helps the imagination", "entertaining", and "assists problem-solving", were typical words used. Eight parents had issues with *Adventure Rock* such as they felt it was "boring", "frustrating", "repetitive", or "old-fashioned." All

the parents felt it was a good idea to involve children in testing out the new service. Some parents reported that their child needed assistance (13), but more parents (24) said their child needed no help at all to download, register and start playing *Adventure Rock*. 17 parents said their children had enjoyed playing *Adventure Rock*, 14 parents reported their children had enjoyed playing *Adventure Rock* "very much" and 5 parents said their children had only enjoyed playing "a bit."

37 parents were not worried about their children's safety, with only one parent saying they were worried. This could be due to the positive perception of the CBBC brand as one or two parents qualified their answer by saying they trusted the BBC to keep their children safe. 14 parents said their perception of CBBC had changed, with 21 parents saying they still had the same opinion. Of the parents whose perception had changed one said "It's trying to have more things for kids to do" and another parent admitted, "I didn't really realise until taking part in the *Adventure Rock* project how much CBBC does for children besides just television programmes." Of the parents who said their perception of the BBC had changed since seeing *Adventure Rock* one parent said "It shows it's trying to improve children's abilities and interests." A second comment was, "Yes, this does go to show us how much education a child can get from the BBC." One parent felt that it was "right to explore 'new' virtual worlds, but can you really compete with commercial games and educational websites? This falls in between."

24 parents felt *Adventure Rock* was new or exciting (against 12 parents who said 'no'). Of the parents who were enthusiastic words such as "exciting", "challenging", "innovative", and "stimulating" were used. The parents who felt *Adventure Rock* was not new or exciting felt it was "similar to other platform games like Sonic," or "it takes up a lot of disc space and needs to maybe have more instructions as you are going along." Two parents felt *Adventure Rock* was "not exciting enough" and that their child "lost interest in it quite quickly." 17 parents felt virtual worlds for children were a positive thing, with three parents being negative and seven parents being 'neutral'.

When asked about virtual worlds for children the parents were mainly positive, for example 24 parents thought *Adventure Rock* was new and exciting, against 12 who gave either neutral or negative comments:

Examples of positive comments:

- "It's a great way to expand children's minds."
- "I think online learning games are very good."
- "I feel virtual world online games may help children in their imagining skills."
- "I think they are good. Technology has become a large part of children's everyday lives."

Examples of negative comments:

- "I have seen them, but I am still not happy about 'online' games. Virtual worlds are OK but with respect, I prefer my kids to experience the real world."
- "Online games good in moderation – can be addictive."
- "I think they are OK as long as children are not spending too much time on them."

32 parents said their children play internet games, three said their children did not play internet games and two parents didn't know. Of the parents who were aware their children play internet games many parents felt it was important that games and virtual worlds were safe, moderated, and used constructively, for example as part of a "balanced learning and playtime regime." This need for balance was echoed by other parents in the survey, yet it was also obvious the parents in the study realised the importance of children understanding new technology. One parent said "We live in a world of new technology. Children face challenges that I never had as a child. They have to keep up with technology." Only six parents were concerned at the amount of time their children played *Adventure Rock*, 33 parents were not concerned. Of those parents who were concerned one said "my daughter suffers from migraines", but there were no other comments given.

Thirteen principles for a successful virtual world for children

During the workshops, half of the time was spent asking the children to express through discussion and artwork what they wanted to find in a virtual world for children. This, along with the other data previously presented, has been compiled into thirteen 'principles' for a successful virtual world for children:

FINDING: Thirteen principles for a successful virtual world for children

1. **Sociable – meeting and chatting**
2. **Creative – making avatar, making things**
3. **Control – owning and changing the space**
4. **A big 'outdoors' world to explore**
5. **Visible status – how am I doing?**
6. **Clear location – where am I? + easy transport**
7. **Mission and motivation – what's the purpose?**
8. **Some humour**
9. **Help when you need it**
10. **Chance to see professional video, their own work, and other children's**
11. **Somewhere to live – a home or town**
12. **Shops – buying stuff**
13. **A space away from adult rules (as seen in: everything chocolate!)**

These principles are largely self-explanatory, and the points have generally been discussed elsewhere in this report. Point #3: *Adventure Rock* is arguably a world for children, but the majority of the children wanted to have a 'children's world'; in the first instance the producers make and extend the world and in the second, the children contribute to the world and how the world grows. The point of #13, "A space away from adult rules", is that children wanted the virtual space to be free from adult conventions and interventions. This could be seen most clearly in the fact that many of the children imagined a fantasy world where everything was made of chocolate: we believe that here the freedom to eat as much chocolate as a child might want represents the desire to escape from the limitations routinely imposed by well-intentioned but fun-dampening adults.

Most of the children who took part in the study wanted to continue playing *Adventure Rock* at the end of the second workshop. Many children expressed their distress that their log in would expire at the end of the following month; but were reassured when it was explained that they would be able to create their own, new, log in at any time in the future. One or two children said they wouldn't carry on playing *Adventure Rock*, and this was for a variety of reasons. Some of the boys wanted more 'violence' and to be able to have virtual wars or role play (*World of Warcraft* was most cited as the place they would go to). The main places the children went to, if they were not playing *Adventure Rock* were *Club Penguin*, *Nicktropolis*, *Habbo Hotel* (older girls), and *Barbie Girls* (younger girls).

EXISTING VIRTUAL WORLDS FOR CHILDREN: A COMPARATIVE ANALYSIS

Virtual worlds and multi-player role play gaming environments are very similar and could arguably be 'converging'. Commercial services typically offer a two-level experience for gamers, a free 'entry' experience, and member features which require subscription.

A new feature, particularly prevalent in virtual worlds for children, is to sell real world toys or MP3 players which carry a code, which offers a limited time subscription. In this way there is built in obsolescence and the purchaser must buy a subscription to the online service within perhaps one year.

It is clear that immersive environments which are online rather than downloaded are preferred by the audiences, as are environments which are well hosted, facilitated, moderated and iteratively extended. A further trend is to work in partnership with parents, ensuring the parent opens an account and sets the level of engagement for their own child. In addition, children and teenagers are beginning to assist the producers to run the environments.

1. *Club Penguin* (www.clubpenguin.com)

The *Club Penguin* world is aimed at 6-14 year old boys and girls who can accumulate and spend virtual coins through game play. Children create an avatar which moves through the range of places (clubs, shops, a beach) and chat to other penguins. One or two of the children in the study on *Adventure Rock* reported meeting up with their friends on *Club Penguin* at a certain time in the evening. In addition to the free-chat with appears in speech bubbles above the penguin, the children can send each other postcards, and also send emails, whether or not they are online. Members can adopt a 'puffle' (a small, round, furry pet), create 'fan art' and 'fan comics', download posters and screen savers, contribute and read about new features via a blog from 'BillyBob' who represents the *Club Penguin* team. The children can also vote in polls, take part in competitions, and donate points to campaigns to help disadvantaged children. *Club Penguin* ran a charity campaign in December 2007 (http://www.clubpenguin.com/parents/kids-helping-kids.htm). They claim that more than 2.5 million children donated over 2 billion virtual coins, which they had earned playing games, in order to support the environment, children's health or children in developing countries.

This is a subscription model. *Club Penguin* is free to play, but additional features (buying clothing, decorating an igloo) require membership (£3.95 per month). You can also buy gift tokens and game cards. There are links through to *Club Penguin* shop, which is actually the Disney online shop. There is no third party advertising.

Club Penguin offers parents the ability to impose controls on the level of interaction children can have with each other, and they can also look at their child's account activity. Parents can set play times (of the day) and the length of time their children can play *Club Penguin*. There are two chat options, *Ultimate Safe Chat* offers children a predefined menu of greetings, questions and statements, as well as emotes, actions and greeting cards. The children using 'Ultimate Safe Chat' can only see messages which are also pre-defined. *Standard Safe Chat* allows players to type their own messages to other users, but each message is filtered to allow only pre-approved words and phrases, and blocks phone numbers or other information such as an address. *Club Penguin* admit, on their website, that "comments that could be offensive to some players may occasionally get through". The service is therefore moderated and children can call or alert a moderator via an 'M' icon in the top right hand side of the screen. The *Club Penguin* moderators are known as 'CSR's' or 'Community Service Representatives'. They are recruited via the website and other methods, they must be 18 years of age or older, and live in or near Kelowna, British Columbia, Canada.

The children in the *Adventure Rock* study had this to say about *Club Penguin:*

I like that I can adopt a pet. I like that I can have my own room and that I can decorate it, but I feel cheated by them because they show me good things and when I go to them they say sorry you have to be a member and pay us money every month (girl, 10, Glasgow).

Today I visited *Club Penguin*. I think *Club Penguin* is so popular because you can interact with other people. I think if you wanted to make *Adventure Rock* better you could have a special email thing so you can talk to your friends and ask for tips (girl, 9, Glasgow).

Club Penguin: I liked it because it has lots of games and it has hats, clothes, glasses and etc. I did not like it because it's not 3D and it does not feel like you are in the game like *Adventure Rock* does. Using the mouse to click, prefer the keyboard (girl, 10, Glasgow).

2. *Adventure Quest* (www.battleon.com)

Figure 5 Adventure Quest

Many of the older boys in the *Adventure Rock* study felt *Adventure Quest* was the most similar virtual world (or MMORG) to *Adventure Rock*. *Adventure Quest* was created by Artix Entertainment, LLC in 2002. At a typical moment in July 2008, there were 10,600 players online. It is a free online fantasy role playing game, with a subscription payable for additional features. There are no separate downloads and the game functions within a web browser, using Adobe Flash. There are between 1-2 quests to complete every week, and classes to learn how to progress up the hierarchy, about the culture, technical aspects of the game, the characters, and the quests themselves. Over 700 monsters must be dealt with by players, and both the monsters and characters may have magical powers.

In addition to the setting of quests (in the message boards), the management team add new content to the game and updating the main game engine to improve the experience, as an ongoing activity. They say they offer "over 1000 unique enemies to encounter, 700 unique weapons, over 200 unique armours [sic] and shields to use, and hundreds of spells and pets to aid you in battle, all found in dozens of quests, towns and areas through the world."

Adventure Quest is a single player game which also has events where players work together, however they cannot chat to each other. In this way they collaborate to achieve "story-oriented goals." New players have the status of a Fighter, Mage or Rogue, but can become 'Guardians' who have additional powers and full access to the game for a one-off payment of $19.95. A further $5.00 gives you the status of an 'XGuardian'. Guardians gain access to 'dozens of quests', and the ability to shop for items in the Guardian Tower online shop, they also receive weapons and can have pets (Fairy

Godparents and Clones – of themselves). Guardians receive 300 'Z-Tokens' which are the local currency, potions to keep their character well, they can travel to other parts of the world, and finally, compete in wars.

Adventure Quest is managed by administrative staff, assisted by forum moderators and IRC operators (for the real-time chat areas). The emphasis for the care of children under 13 is placed with their parents, who must create an account of behalf of the child, and decide whether the content is suitable. It must be the parent who makes any purchases, or someone who is able to say they are over 18, and has a credit card or other means of payment.

Quests are set by the staff of *Adventure Quest* in the message boards, and there are often two quests each week. The instructions take the form of 'chat', links to instructional videos and places in the world, and directions in text. This can mean that the quests resemble the old MUDs and MOOs of the 1980s.

3. *Runescape* (www.runescape.com)

RuneScape is a massively-multiplayer online role play game (MMORG) set in a fictional world, with its own economy. It is web-based, and runs directly from the website using Java. There are over 120 million players worldwide. Items are traded daily using the in-game currency called 'gp'. Player's characters can develop skills such as fishing, smithing and crafting; these skills are used in the quests and battles against monsters. Jagex, the makers of *RuneScape*, claim younger players benefit from solving puzzles that "test their logic and lateral-thinking skills". Many quests and aspects of the game require collaborative activity to achieve a goal. The makers believe children's team and communication skills are improved, alongside the "opportunity to learn more about trading goods, saving money for that special item, and how to budget. Players can even develop knowledge about practical skills such as farming, cooking and looking after pets". All players have access to the forums, and subscribers can also post messages. If you subscribe (between £3.20 and £5.00 per month) you are given access to more areas of the world, and your character is given more skills, objects, and mini games.

Figure 6 Example of the costume choices offered for Avatar Characters in RuneScape

Members' game characters receive nine additional skills, allowing them to construct and decorate their own in-game house, use shortcuts to move more quickly around the landscape, make their own potions, and fight with a magical creature by their side. There are more than 100 quests for members only, and more mini-games. At a typical moment in July 2008, there were 136,500 people playing. Jagex, the games company who created and run *RuneScape*, claim 130 million accounts have been created. *RuneScape* is aimed at players aged 13+ however younger players can access the world, and use the 'Quick Chat' system to communicate, which uses pre-set sentences. *RuneScape* say they "encourage parents to supervise their children while they play".

In March 2008, Jagex was named as one of the "100 Best Companies to Work For" for the second year in succession by the Sunday Times. An independent developer and publisher of online games based in Cambridge, half the 350 staff are engaged in providing support for players, such as answering queries and assisting with disputes or lost passwords. The remaining staff work on extending *RuneScape* (scriptwriting, coding, graphics, audio and testing), as the world is continually updated. They are aiming to launch *RuneScape* in other European countries; it has already launched in Germany.

4. *Nicktropolis* (www.nick.com)

Nicktropolis is a virtual space which supports the linear content provided by the Nickelodeon Television channels. It is similar to *Club Penguin*, in that it is a collection of 'interesting places to go', rather than a large-scale virtual world where elaborate quests are undertaken; the children are offered a range of isolated activities. It is necessary to create an avatar and possible to decorate a room where you can hang out with friends,

chat, and adopt a virtual pet. There are mini-games and larger games, the children can watch videos, create their own comic, go on a weekly treasure hunt. Members have their own dedicated member's rooms. There are multi-player games and characters from the television programmes, such as Spongebob Squarepants, can be 'visited'. Avatar clothes and furniture can be swapped amongst the other players. At a typical moment in July 2008, there were 7,747,435 registered users, of whom 61,257 were on line.

> Nicktropolis is a really, really good website to play games on (girl, 8, London).

5. *Habbo Hotel* (www.sulake.com)

Habbo Hotel is arguably the oldest and largest immersive world for teenagers, with more than two million new members joining, worldwide, every month. It is a virtual hotel where teenagers can socialise with others, using their avatars, in personalised private and public hotel rooms. Teenagers can furnish their rooms and adopt a pet. There are mini-games within the hotel, chat and regular events. At a typical moment in July 2008 there were 7,488 Habbos online in Habbo UK, and 438,6006 Habbos were registered.

Sulake, the company who create and manage the localised versions of *Habbo Hotel*, have offices in Europe, USA, Japan, China and other countries; they are expanding each year into new territories. *Habbo Hotel* launched in 2000, and currently attracts nearly ten million visitors each month, worldwide. It is a sophisticated, subscription-driven service which offers additional games, clothes, hair and dance styles to subscribed members. It is also possible to access club rooms and invite 100 more friends on to your buddy list. *Habbo* members are given one additional piece of furniture (known as 'furni') each month, however it is possible to buy furni via a credit card or over the phone. Rooms can be rated by other members. The longer you subscribe for, the more credits you earn (1 Month = 30 Credits, 3 Months = 70 Credits, and 6 Months = 120 Credits). If you buy additional *Habbo* Credits you can swap those for furni (450 *Habbo* Credits cost £30.00).

> Habbo Hotel...[To gain points] you have to buy them, that is DEFINITELY not the type of game I would like to play. What is the point? You just spend them on silly things e.g. playing games and getting some stuff for your hotel (girl, 11, Cardiff).

Only a few of the older girls in the *Adventure Rock* study seemed to be attracted to *Habbo Hotel*, and the researchers got the impression it was slightly too 'old' for most the children aged 7-11.

6. *Barbie Girls* (www.barbiegirls.com)

In *Barbie Girls*, players can create and decorate a virtual room, design an avatar, play games, earn Barbie Bucks and chat to friends. *Barbie Girls*, in common with all the other commercial services, invites participation, then encourages a deeper commitment to the world through additional features added after having subscribed to the service. VIP members have access to additional games, but they can also adopt an online pet and receive more hairstyles and clothes. The children can send and receive gifts from each other and 'virtual makeovers' are offered. VIPs have access to an amusement park, and they can shop for clothes, 'furni' (using the name coined by *Habbo Hotel*), and accessories for their pet. VIP members gain access to the site first if it is busy.

These comments about *Habbo Hotel* and *Barbie Girls* are from a workbook by one of the 11 year old female participants from London:

> "I went to www.habbo.com it was very addictive! It is not like *Adventure Rock*. The website involves credits which have to be bought on telephone to revise the credit accessory (not quite good), buy furniture. There is an idea of trading with virtual friends. I enjoyed playing with *Habbo Hotel*. I went to *Barbie Girls.com* it was OK from the start, nearly the same as *Habbo Hotel*. *Barbie Girls.com* involves: to get money you have to play games and win. There are lots of shops in there."

This girl goes back into *Barbie Girls* again two days later:

> "More things *Barbie Girls* includes: you can buy clothes from your money and you can buy furniture, even you can make your own rooms and you can send messages, talk to people as well, and buy jewellery."

She goes back to *Habbo Hotel*, *Barbie Girls* and *Adventure Rock*, a day later:

> "I really enjoyed the websites."

Four days later she went back to *Habbo Hotel* for a final visit:

> "Some of my new friend [sic] I met gave me some free furniture. Got some wonderful friends there. *Habbo Hotel* is good but sometimes it's a bit boring sometimes, oh well. I think *Habbo Hotel* is not that adventures, you can sit on sofas, beds (lay on bed) holding drinks. Even go to airports, play games and lots more. But sometimes I feel it's a bit teenager *Habbo* really!!!" (Girl, 11, London)

This girl's final comment in her workbook was to say that *Adventure Rock* was better than *Barbie Girls*.

7. *Moshi Monsters* (www.moshimonsters.com)

Moshi Monsters is aimed at children of all ages, but would be suitable for younger children. Ten and eleven year olds might find it is not sophisticated enough for them. The service places more emphasis on entertainment which is also educational. Children adopt a pet monster which they design and subsequently ensure remains fed, watered, amused and healthy. The monster's character develops as the child plays with it and earns things to nurture their pet by solving a daily puzzle. The in-game currency is 'Rox', which can be used to buy objects for the monster in a shop.

The children can make new friends and meet existing friends using blogs, newsfeeds, pin boards and buddy lists. The monsters in *Moshi Monsters* live in Monstro City, and new locations, it is said, will be added; the service is currently in beta. Parents can also become members and adopt their own monster.

8. *My Tiny Planets* (www.mytinyplanets.com)

Figure 7 My Tiny Planets

My Tiny Planets is a graphically lush virtual universe for children, just finishing its beta test in July 2008. Children choose and create a planet, including its vegetation and buildings; they also pilot spaceships around their Galaxy, and to other Galaxies in the Universe. The detailed scenery is realised in high quality 3D graphics. It is perhaps the most adventurous immersive place for children, yet the researchers felt it faced problems. First, it requires a high level of technical ability, as it takes some time to set up a world and learn how everything works. Second, locating other children, and finding a place where there are other children socialising, does not appear to be easy. Third, there seems to be a lack of facilitated activity for the children.

It is necessary to have both Flash and Shockwave on the child's computer, and therefore some parental assistance might be necessary at the start. (Adobe, which produces the Shockwave player, having acquired its original producer, Macromedia, in 2005), admits that the player is still not installed on 4 out of 10 PCs (June 2008)).

Virtual Worlds for Children: Comparison chart

Name	Content	Revenue Stream	Safety
Club Penguin	For 6-14 year olds. Accumulate and spend virtual coins through game play. Create an avatar. Play games. Adopt a pet (Puffles). Fan art and fan comics. Posters. Wallpapers & screensavers. Blog. Polls. Competitions. Campaigns.	Free, but subscription(£3.95 per month) Means you can buy additional content. Gift tokens and game cards. Links to the Disney online shop.	Parental controls. Predetermined chat and free chat. Moderators.
Adventure Quest	A single player role play game, suitable for all ages. No downloads are needed to play. Events, wars, characters, areas, quests, objects, and 700+ monsters. Classes are given to teach people how to master the world and gain status. You can become a Fighter, Wizard, Ninja, Vampire Slayer, Rogue, Knight, Mage, Paladin, Dragonslayer; and so on.	Free game, but advertising is offered via a 'Partner Programme'. All upgraded members (via subscription) can earn between 30-50% of referred player subscriptions through advertising the game on their own website, if they are over 18.	Staff Members, Forum Moderators and IRC Operators oversee the game. Users under 13 years of age can join in if both they, and their parents, agree to certain conditions: (1) Parents must create an account. (2) Parents must determine whether the content is suitable for their child. (3) Parents create their child's account, which gives access to the email and message boards. (4) Children cannot buy upgrades, only those over 18 can buy additional features or objects.
RuneScape	Quests at different levels. Characters. Pets. Currency. Member only areas Mini-games. Bank. Lend stuff to others. High definition graphics for those who subscribe. Website with forums and game updates.	Subscription costs between £3.20 and £5.00, per month.	The makers of the game Jagex, place the onus on parental responsibility for children over thirteen who play *RuneScape*, however there are forum moderators.
Nicktropolis	Create an avatar. Decorate a room. Mini games and larger games, including multiplayer. Create your own comic. Screensavers. Daily poll. Hang out with friends. Safe chat. Pets. Watch videos. Add friends to a 'safe list'. Weekly treasure hunts. Newsletter. Buy stuff. Top ten members rooms. Score points and swap them for avatar clothes or furniture. Visit favourite characters e.g. Spongebob Squarepants.	Links to the video and website associated with the Nickelodeon TV programmes (Nick.com).	Parents can set their child's account options for example either allowing or not allowing chat. The chat is via a sanitised dictionary, for example, words like 'street' or 'lane' are not allowed, and there are no numerals. The site has a 'dirty phrase checker', and the children can block or report problems or abuse to a moderator.
Habbo Hotel	Teenagers choose and furnish a hotel room, meet others in their rooms, and attend and host events. Buy and download music clips. Furniture can be swapped and also re-cycled in the 'Ecotron'. Teenagers can trade with each other, and also buy money bags, gold, digital TVs and so	Free to visit, but mainly a subscription-based service with additional micro-transactions for furni (furniture, pets, plants, wallpaper, flooring, camera, gifts and trophies). Credit cards can be used to buy Habbo Credits from many different countries. 1 Month = 30 Credits. 3 Months = 70 Credits (15 Credits Reduction).	*Habbo Hotel* is moderated every day, 24 hours. There are moderators, Customer Assistants and teenagers also help to run the Hotel. Head Guides are not staff and they are not paid. They are players who receive badges as a reward. Guides need to work up 10 levels to achieve the title Head Guide. *Habbo Hotel* also use filters, which remove inappropriate Habbo names,

	on. VIP Members (Habbo Club) can have 600 Friends on their Friends List (Console). Normal Members have 100 on their list. Discusion forums Put posters up on your wall (Britney etc) Rate guest rooms in the hotel and view ratings for other Habbos' rooms.	6 Months = 120 Credits (45 Credits Reduction). Payment methods = phone, mobile, credit card, in shops. Prices 450 Habbo Credits = £30.00 250 Habbo Credits = £20.00 100 Habbo Credits = £9.00 50 Habbo Credits = £4.50 35 Habbo Credits = £2.50	guest room names and swearing from items which bear player-created messages. Offensive words are replaced with 'bobba' a form of 'gobbledegook'. In addition, if any instances of 'scripted furni' are found (objects created by someone who is not a Habbo employee), it is considered a grave offence.
Barbie Girls	Shop for new furniture ('furni'). Chat. Play games. Create a room for yourself and invite up to five friends. Email friends on your friends list. Hang out in a tree house. Buy clothes and get virtual makeovers. Earn *B*Bucks by playing games, buy objects for your Barbie Girl. Buy a Barbie Girl device (MP3 Player), play music clips and get a one year subscription to Barbie Girls online. The device can copy music and other files from the child's CDs to the child's personal space on Barbie Girls.	Subscription: 1 month = $5.99, 3 months = $17.97, and 6 months = $35.94. Barbie Girl Device (MP3 Player) is sold in shops. This comes with a year's subscription to Barbiegirls.com, on registration of the device.	Parents can create an account and choose the level of interaction their child has with others. Barbie Chat is offered to all the children, it uses a drop down menu of words and phrases. Super *B*Chat is offered to registered members who have permission from their parents. A word filter blocks anything inappropriate and chat is only possible with other children who have also received their parent's permission. Children who have the Barbie Girl MP3Player can connected their Barbie Girl devices into each other's computers, type in messages using a dictionary of words compiled by Barbie Girl (there is also a filter) and invite each other via chat to each other's virtual rooms on Barbie Girl. If there are any other children in the girls' rooms, they will automatically be removed.
Moshi Monsters	Friend list, find a friend. Create, adopt and look after a monster. Play educational games. 'Monstar of the Week' and 'Room of the Week'. Daily puzzles. Track your progress through the levels of the game, and how popular your monster is in the community.	Subscription from Christmas 2008. MoPods are mobile phone charms that light up and spin when you receive a call, text, email or voice message. You can attach them to your bag, belt loop or key chain - so you'll know when your phone is ringing, even when it's set to 'silent'. You could even attach one directly to your cell phone for a cool look. Moo Cards & Stickers Create your very own Moshi Monster greeting and postcards to send to friends, stickers to stick just about anywhere, mini cards and more!	If you give registration consent, your child will be able to invite friends into his or her network, and communicate with kids in their network through features like the "pin board." Messages are filtered and twice moderated. First by the Monster Owner and if reported, messages are moderated by a team of professional moderators.
My Tiny Planets	Create a spaceship. Customise avatar. Create a world. Play games. Chat. Meet other citizens. Learn about the economy (MTP Stars can be earned or bought) Buy and fly spaceships. Garden space-plants in a bio dome. Teleport to other places and planets. Customise a planet and its landscapes and buildings. Games rooms, chat rooms, message rooms, quiz rooms and factoid rooms.	Subscription and micro-payments (buy plants, objects and so on).	Moderated, but not facilitated. Children under 13 must get their parent's permission. Filtering software is also used, however the producers "Expect as part of the Terms and Conditions of using this site that both children and parents will play their part." Pre-scripted chat can be chosen by the child. Chat is recorded in a chat log, which the user or producers can see.

THE VALUE OF VIRTUAL WORLDS FOR CHILDREN

The findings of this study are that properly produced virtual worlds for children are seen by both parents and children alike as being a positive thing. Access to a public service virtual world for children was liked by both parents and children, not least because it is free from subscription or marketing. The children in the study appeared to accept having to pay for access to most virtual worlds as a 'fact of life', however one of the reasons they valued *Adventure Rock* was because their parents didn't necessarily have to be involved in any financial transaction; this may be reflective of a wish to take control of their own access to media, rather than any concern for their parents financial wellbeing.

The researchers have drawn up a list of positive comments from the parents and children, showing the value of virtual worlds tend to outweigh possible negative aspects. We strongly wish to qualify that, however, by saying this is not a list of the value of *Adventure Rock* as some of the potential values are not provided by *Adventure Rock* (social skills, becoming a creator, having responsibilities). In the future *Adventure Rock* may offer all the values we suggest virtual worlds offer children.

FINDING: The value of virtual worlds for children

1. **A playful, engaging, interactive alternative to more passive media.**
2. **Becoming a creator and having control over elements of a world.**
3. **Creating mental maps, exploring, and understanding a new world and its systems (e.g. transport, money).**
4. **Rehearsing having responsibilities, looking after things.**
5. **Learning social skills.**
6. **Playing with identity, e.g. dressing up.**
7. **A tool for self-expression.**
8. **Computer literacy**

In addition, the researchers feel *Adventure Rock* may offer some additional benefits to children and BBC Children's. There is an opportunity to involve children in the continuing development of *Adventure Rock* (and the other associated content, for example the website) and, perhaps the ongoing management of elements of the service, for example, 'meeting and greeting' new players, or answering simple questions about the game. As virtual worlds are – to some degree – a reflection of elements of the real world, it may be possible to use *Adventure Rock* to assist children to get more involved in the world as citizens who have both rights and responsibilities; if not 'in game' then via other means.

Finally, *Adventure Rock* should be seen as one of a suite of new types of social media services for children on CBBC, and as part of an ongoing exploration into new types of participatory media. *Adventure Rock* therefore complements *Bamzooki* (where players create imaginary creatures), *My CBBC* (where children can create and decorate their own room, chat using strings of pre-formatted text, and bookmark programmes), and a massively multiplayer game provisionally titled *Tronji*, due to launch in 2008–09.

What we already know about children and imaginative play

It was important to undertake a literature review to establish what we already know about children and imaginative play, and children and virtual worlds, before the researchers began the research project on *Adventure Rock.* There is much literature on the nature of play, giving rise to the idea of play as a means to release surplus energy, as relaxation, of play as something instinctive and of play as a preparation.

For many early researchers the play was seen as an artificial category, something rather nebulous, that it had no practical function in everyday life. The theory that play is instinctive fell into some disrepute, however the idea that play is "preparation for adult life" is still being discussed. Newer theory suggests that "In pretending, children often express indirectly or symbolically pressing worries or fears and repeat these themes again and again", which suggests there is a cathartic element to play, i.e. there is an attempt to resolve difficult situations (Garvey, 1977: 9). This idea assumes children use imaginative play solely to solve problems or to emotionally manage difficult or unpleasant situations which should also take into account the pleasure of play activities.

In the 1950's and 60's psychologists had begun to look at the play activities of young animals, Ellis described how the scientists had noticed how young animals approached new objects. "The procedure that commonly occurs is for the animal to first indulge in locomotor exploration. Investigating the situation by moving around the object allows the exploration of its properties by distance receptors, while preserving the options for escape." Social interaction was another cause of motivation, stimulation and learning, "as more and more interactions are experienced, more and more connections between antecedent-subsequent events are made. More cause-effect relations are established" (Ellis, 1973: 97-99). In this way young animals find out the probable effect of different activities, therefore assisting them to adapt and deal with unpredictable situations.

Studies in the 1990's noted the importance of play, including imaginative play,

> "As the children grow older and, having had plenty of opportunity for opening up and establishing their personalities more, through play, round about six or six and a half you may notice a certain dignity in some of them. They begin to be more sensible, they can be relied upon to take a message, they keep the rules,

> they tend to be neat in clothing, they are punctual, they bring coffee without spilling it, they are cheerful and polite to visitors" (Slade, 1995:64).

In other words, children were seen as adults in training, practising the skills of adult life. In addition, it was thought makebelieve play stimulated our ability to imagine possible outcomes and conclusions to situations, "I propose that the early make-believe of children is the starting point for the development of narrative thought" (Goldstein, 1994: 26).

More recently there has been a shift from considering children in the context of a developing adult, "they have to be seen and respected as subjects in their own right who develop their own and unique cultural milieus" (Fromme, 2003: 5). Fromme believes it is a mistake to consider childhood merely within the context of protection, preparation and development; and that children should be encouraged to actively participate in the ongoing construction and deconstruction of their own social and cultural world. Children should be seen as the experts, able to discuss and comment on their own media, for example.

Ideas about the nature of 'adult' play have also changed. Play is seen as a legitimate, productive activity which may be used to 'rehearse' or simulate real world situations; for therapy or to analyse risk. Celia Pearce puts forward the idea of 'communities of play', to complement online communities of practice or interest. "The play community shares a strong social connection, as well as a mutual play style that is both inclusive and flexible, and can be transformed and relocated as needed to sustain the group" (Pearce, 2007: 315).

As human beings we like to imagine new worlds. John Carey listed 500 utopias in the *Faber Book of Utopias* (1999). He believes:

> "Utopias elude definition. The genre merges, at its edges, into related forms – the imaginary voyage, the earthly or heavenly paradise, the political manifesto or Constitution. But an average, middle-of-the road utopia will include transit to some other place, remote in space or time or both, where the inhabitants are different from us, perhaps recognisably human, perhaps not, and where something can be learned about how life should be lived."

Carey cites the earliest European utopia as being Plato's *Republic*, written around 360 BC, followed by the Roman historian Tacitus who wrote the *Germania* in AD 98, "a work of political and moral exhortation" (Carey, 1999:16). These works were followed by Plutarch's *Life of Lycurgus* (AD 120), Sir Thomas Moore's *Utopia* (1516) and on and on. Imagining words different from our own is, perhaps, something we do naturally as a species. Just as adults enjoy reading about imagined worlds, perhaps stimulating imaginative individual thoughts and dreams, so children have enjoyed fairy tales and

stories which provide imagined worlds inhabited by giants, fairies, Hobbits or, more recently, trainee wizards:

> "For a story truly to hold the child's attention, it must entertain him and arouse his curiosity. But to enrich his life, it must stimulate his imagination; help him to develop his intellect and to clarify his emotions; be attuned to his anxieties and aspirations; give full recognition to his difficulties, while at the same time suggesting solutions to the problems which perturb him" (Bettelheim, 1991:5).

Bettelheim believed fairy tales perform a highly important function for children, that life will be about struggling against difficulties, and that is an unavoidable fact. Fairy tales deal with universal human problems, and particularly problems which a child might be thinking about (finding your way back home, or assessing whether a stranger is benign or not, or finding a way out of poverty, or a solution for an injustice, for example). "These stories speak to his budding ego and encourage its development, while, at the same time, relieving preconscious and conscious pressures" (Bettelheim, 1991: 6).

Moving forward to the digital age, two studies can be consulted for an indication of children's orientation to immersive media. The first is *The Young People and New Media Project* undertaken by the LSE, ending in 2002. 15,000 6-16 year olds participated in a study focussing on terrestrial and cable/satellite television, the personal computer, the VCR, the CD-Rom, TV-linked games consoles, the Internet and email. Sonia Livingstone and her team found "In gaining familiarity with new technological formats and interfaces, one key mode of engagement provides an entry point for children and young people, namely games-playing, favoured for work or play, alone or in company, as part of learning or relaxing" (Livingstone, 2003:229). In addition to validating the activity of digital play Livingstone goes on to note how

> "the multimodal nature of new media contents brings together multiple forms of engagement hitherto considered distinct forms of production (writing, drawing, designing) and reception (reading, listening, viewing, learning), as well as activities commonly distinguished from the reception of mass media (playing, talking, researching, performing). Yet both social commentators – and the public – still tend to conceptualise media and activities which are converging as if they were in competition with each other (e.g. television versus computer games, books versus screen, watching versus doing)" (Livingstone, 2003:221).

Livingstone believes we should widen our idea of literacy to encompass a more "plural and diverse range of literacies important in the new media and information environment." Within the video game the reader has become a performer who takes control of the environment. Livingstone found certain words repeatedly coming up when she talked to children about computer games, such as "control", "challenge", and "freedom", quoting a working class girl aged 9 who said "I prefer games like Super

Mario – you want to just control them and jump on the mushrooms…And I like Super Mario because it's just really, like a challenge kind of thing."

David Buckingham also supports the idea that computers have positive benefits for the development and empowerment of children commenting "those immersed in new digital tools and networks are engaged in an unprecedented exploration of language, games, social interaction, problem solving, and self-directed activity that leads to diverse forms of learning" (Buckingham, 2008: vii). Drotner (2008) believes that amongst many other benefits of computer games for children, interaction and dialogue help the development of personal expression and negotiation, something contrary to the often touted perception of gaming as a solus activity which produces children incapable of socialising in the real world. The growth of Massively Multiplayer Online Games (MMOGs or MMOs) and Massively Multiplayer Online Role-playing Games (MMORGS) is encouraging a sharp increase in the numbers of children who interact in immersive online environments. MMOs and MMORGS are, arguably, the direct precedents of virtual worlds.

The origins and development of virtual worlds

The growing body of literature on virtual worlds and immersive games notably includes the work of Edward Castronova. Castronova feels the growth in the numbers of players of MMOs and MMORGS was because the people who played games as children in the 1980's and early 1990's "became game playing adults after the turn of the century, many of them – 20 million or so – began to play massively multiplayer online game" (Castronova, 2006: 57).

A new academic sub-field, 'ludology', appeared, claiming MMOs were a unique form of cultural expression. Others argued MMOs merely extended existing artistic forms. Ludology can be defined as the academic study of games, "the term 'ludic' comes from the Latin word *ludus* meaning 'game'" (Buckingham, 2006:9). The naming of the field helped to give clarification to studies as they began to emerge. Some immersive environments are more narrative-led than others, therefore they could be considered games; other immersive environments have no particular outcome. The inhabitants of *Second Life*, and Linden Labs who created the world, believe *Second Life* is not a game, as it has no end. There are, however, different narrative structures in *Second Life* or elements of narratives which assist inhabitants to construct, for themselves and by themselves, an extant culture and social structures which could be seen as naturally-occurring narratives.

> "The use of narrative elements in computer games such as individuated characters, concrete setting and naturalisable goals and actions is not an end in itself, but a means towards the goal of luring the players into the game-world.

> Narrativity performs an instrumental rather than a strictly aesthetic function; once the player is immersed in the game, the narrative theme may be backgrounded or temporarily forgotten" (Ryan, 2001: 14).

Considering virtual worlds are Edward Castronova's area of specialism it surprising he includes advice on gaming addition in his work. In his book *Synthetic Worlds: The Business and Culture of Online Games* (2006) he leads to the website and work of Dr Maressa Orzack who gives clear advice on indicators showing someone might have a problem (www.computeraddiction.com); however this is tempered with the advice that "we can only judge whether presence in a virtual world is good or bad by reference to the ordinary daily life of the person making the choice to go there. For some people, Earth is where they really ought to spend their time. For others, perhaps the fantasy world *is the only decent place available"* (Castronova, 2006: 65).

The conclusion from Castronova's Norrath Economic Survey (Norrath is the name given to the place where the on-going quest takes place), was that *EverQuest* was "no more intense time-wise than watching TV" (Castronova, 2006: 62). In 2006 Castronova noted that existing scholarly research does not "shed much direct light on user-motivations in the case of synthetic worlds". Two studies in the late 1990's (Livingstone and Bovill, 1999, and Roberts and Foehr, 2004) maintain children were spending between twenty-five to forty-five minutes a day playing computer games. One of the main draws of immersive media such as games and virtual worlds which also offer gaming is the feeling of being completely 'in game'. This feeling is achieved through

> "The management of strategic variables and the incremental challenges of the game world [which] invite different states of attention. Players slip from engrossed immersion to a more deliberate or calculating engagement. Because computer games offer an immersive, participatory environment, as well as feedback, incremental and engaging challenges and contextualised goals, they may potentially evoke a flow response in their users" (Carr, 2007:57-58).

Richard Bartle, who it is claimed co-wrote the first text-based multi-user world in 1979, at Essex University, gives a list of four types which he felt might be useful for game developers:

- Explorers: People who come to see what is there and to map it for others. They are happiest with challenges that involve the gradual revelation of the world. They want the world to be very big, and filled with hidden beauty that can only be unlocked through persistence and creativity.
- Socialisers: People who come to be with others. They are happiest with challenges that involve forming groups with others to accomplish shared objectives. They want the world to have extensive social infrastructure and shared activities: towns, clubs, arenas, weddings, hunting parties.

- Achievers: People who come to build. They are happiest with challenges that involve the gradual accumulation of things worthy of social respect. They want the world that allows all kinds of capital accumulation and reputation-building. They want the ability to increase the power of their avatar, to build new structures, to hoard wealth, and to change the world itself.
- Controllers: People who come to dominate other people. They are happiest with challenges that involve competing with others and defeating them. Also described as "griefers," they want worlds that allow users to intervene in the activities of other users, so that a record of domination and control can be established. To them, it is all sport" (Bartle, 2003: 130).

The present study supports and extends Bartle's work in this area by providing an analysis of the orientations to *Adventure Rock* shown by the children in the study. Parallels can be seen between Bartle's 'types', mainly on virtual worlds for adults, and those presented in this study; this usefully serves to validate both sets of data.

Building virtual worlds

The creation of an online world has two stages. First there is deciding on a goal for the game and rules. As Stephanie Natkin says, "The designer outlines the context (epoch, style, historical or mythical references), the geography and principles of navigation within this universe, and the principal characters. The gameplay includes the objective of the game and its principle stages, the types of quests that the player will have to complete, and the gaming mechanisms used (revelation of partial objectives, obstacles, techniques for solution)" (Natkin, 2006:30-31). There are further issues to consider too, how the player will perceive the world (as if the view was through the avatar's 'eyes' or whether the 'camera' is slightly behind and above the player's avatar), the way the user-interface is structured, and the general ergonomics of the game. The second stage is to design the scenarios or tiny narratives which will unfold for players; this is generally called 'level design.' Each narrative is not generally organised in a linear way, but on the position of objects which contribute to the narrative and on the logical rules of the game.

One of the greatest problems is the transition into and out of virtual worlds and acclimatisation into the world; learning how everything works. At a recent conference on the educational uses of virtual worlds, Aleks Krotoski reported that 80 per cent of the people who register for *Second Life* almost immediately leave, or give up, as they find the technology too difficult (London Knowledge Lab, 13 June 2008). A second reason is the fact that they don't want to place their real details into the Linden Labs registration system, for this reason Linden Labs are considering constructing an 'Alt SL' where you can be anonymous; people don't want to be trackable or traceable. For businesses or

educationalists using *Second Life* as a tool, this resistance to being traceable in the real world might be a problem. The finding of a technological barrier to entry or adoption was also supported by Diane Carr, at the same conference, who (with her co-researchers) noted an adoption curve in both *World of Warcraft* and *Second Life*.

At the moment, the 'membrane' around virtual worlds acts as both protection and as a barrier, but that is likely to change. "If people are eventually to move freely among worlds, there will be a demand for portable identities and reputations" (Castronova, 2005). Jon Dovey and Helen Kennedy expressed Castronova's 'membrane' in more optimistic terms as a magic circle; "the 'magic circle' defines a separate space for play, it is not a utopian space, a nowhere – it still exists in the context of social time and material space" (Dovey and Kennedy, 2006: 29). When the BBC first started its first online communities the message boards and chat rooms were situated away from the main body of content and were not as integrated as they sometimes are now; this may be a common response from producers to dealing with new kinds of environments where new facilitation practices must be found and a new relationship with a creative and contributing audience refined. "In the case of video-computer gaming to work at all with the notion of 'audience' is clearly problematic unless it is clearly redefined. What needs also to be considered is the proposition that children might well be usefully regarded in terms of constituency – as an ensemble of constituencies" (Green, Reid, Bigum, 2003:23). The management of virtual worlds is a developing science therefore the membrane, for the moment, creates a convenient walled garden, but this may not continue.

Active audiences and inhabitants

The consideration of 'life online' began with books from practitioners and practical work from academics creating new social technology. Howard Rheingold wrote about 'virtual' lives and online communities such as *The Well*, sustained by message boards (Rheingold, 1994). Henry Jenkins noted how television audiences were "translating the reception process into social interaction with other fans". In his book *Textual Poachers* (1992: 278) he describes how a significant number of fans of television programmes were engaging in a complex interweave of critical analysis, comment, interaction and creative production.

Jenkins, during an interview with Matt Hills – who incidentally is leading research on Fan Culture with Tristan Ferne from BBC Audio and Music for BBC Innovation under the BBC/AHRC collaborative research scheme – neatly summarises the evolution of academic ideas on creative audiences as 'three moments' (Jenkins, 2006: 11-12). These three moments begin with the work of John Tulloch, John Fiske and Janice Radway who, in the late eighties began to use ethnographic methods to study audiences and establish axes of active/passive consumption to describe audience activity around broadcasts and

resistance/co-opted to describe producer/audience orientations to fan activity. Jenkins puts himself alongside Camille Bacon-Smith as the providers of new thinking, from the early nineties onwards, on participating audiences from an insider's perspective. Others contributed to the academic study of online audiences, such as Sherry Turkle's *Life on the Screen: Identity in the age of the Internet* (1995).

Jenkins believes a third wave of academic study on active audiences is being produced by people who are both fans and academics, however Matt Hills argues that fans and academics can never be 'one' as fans may either resent or be suspicious of studies and academics, in order to study the field, must retain some objectivity, *Fan Cultures* (2002: 3). A second group of academics are those who are also doing consulting on the production and management of social media have, such as Amy Jo Kim who wrote *Community Building on the Web* (2000) and Gilly Salmon's study on the facilitation of virtual learning environments *E-moderating: The key to teaching and learning online* (2000, 2004).

Renegotiating the producer/audience relationship

Convergence, Jenkins argues, is not merely about technology, it is about media producers renegotiating their relationship with audiences (Jenkins, 2006: 24). Many industry 'thinkers' and academics believe audiences are now, in many cases, co-producers, certainly that it is important for producers to involve, include, consult and listen to audiences. Dan Gillmor, founder of the Center for Citizen Media, said "I'm still not convinced that Big Media is doing the most important thing: listening" (Gillmor, 2006:237). Clay Shirky believes 'everyone is a media outlet', and that production is becoming democratised: "When reproduction, distribution, and categorization were all difficult, as they were for the last five hundred years, we needed professionals to undertake those jobs, and we properly venerated those people for the service they performed" (Shirky, 2008: 78). Nowadays, he suggests, these jobs are becoming more widely spread across the population.

FINDING

BBC producers need to begin to think about audiences as co-producers, who 'work' (or play?) alongside professionals, being guided by them. There may be other roles audiences can take, such as greeters, offering technical help, archivists, recommenders, or 'editors of the day'.

For producers, the idea of 'audience as producer' can be problematic, not least because the first conclusion reached might be the disappearance of the producer entirely, but this is not likely as audiences appear to need help, certainly technical help, but also some facilitation, guidance, and to know producers acknowledge the content produced in the creative or social spaces offered by producers for audiences (Jackson, 2008). The shift the audience is making from being 'the-actively-consuming-audience' to being co-producers, inhabitants (in the case of virtual worlds), members of an associated community, or even the audience-as-media-producers is having an effect on policies, media management, rights and responsibilities as well as how the media is commissioned, funded and constructed.

The importance of harnessing audience creativity

Charles Leadbeater began writing about the effects of networks on economies in 1999. He believed that "a collaborative network should provide companies with distributed intelligence, sensing new opportunities, combining different skills and sharing ideas to create and exploit new knowledge" (Leadbeater, 1999: 131). The same ideas about learning new ways to collaborate and cooperate were developed by Leadbeater in his book *We-Think* (2008), about online collaboration and innovation. He argues that "In industrial-era media the quality of information was controlled by professional editors and regulators. As publishing is distributed to many hundreds of millions of people, top-down control of quality will not work. Instead there will have to be more open, transparent, peer review and rating" (Leadbeater, 2008: 236). It has become as important for producers to understand collaborative and social human behaviours as it was to understand narrative form in linear content. The media is becoming more than interactive, the audience are now situating themselves within the media and creating content in the shared space.

Academic studies of online social behaviours from the first ten years of the twenty-first century underline the importance of adjusting to a new relationship between producers and 'those-formerly-known-as-the-audience.' In an analysis of companies who are doing well with the transition from being producers to being facilitators, Don Tapscott and Anthony D. Williams, two respected management consultants from both sides of the Atlantic, found "The losers launched web sites. The winners launched vibrant communities. The losers built walled gardens. The winners built public spaces. The losers innovated internally. The winners innovated with their users. The losers jealously guarded their data and software interfaces. The winners shared them with everyone" (Tapscott and Williams, 2006:39).

The growth of virtual worlds, and virtual worlds for children

The growth of virtual worlds, online games and MMOs is influenced by the availability of technology. Ofcom's most recent study on children's media literacy (Ofcom, 2008) shows access to television remaining dominant, but access to games consoles also being higher than access to the Internet. This is likely to result in the promotion of a games culture amongst the young, particularly if the television is sometimes available for shared use only.

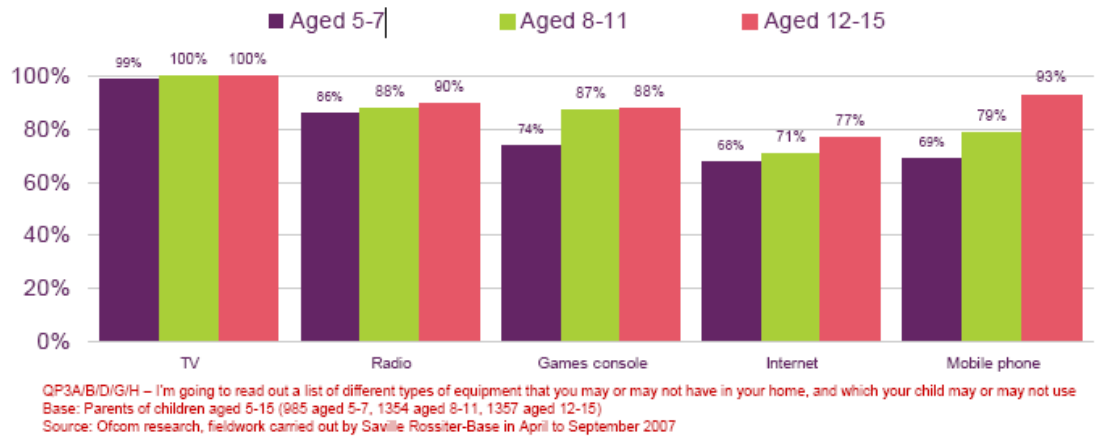
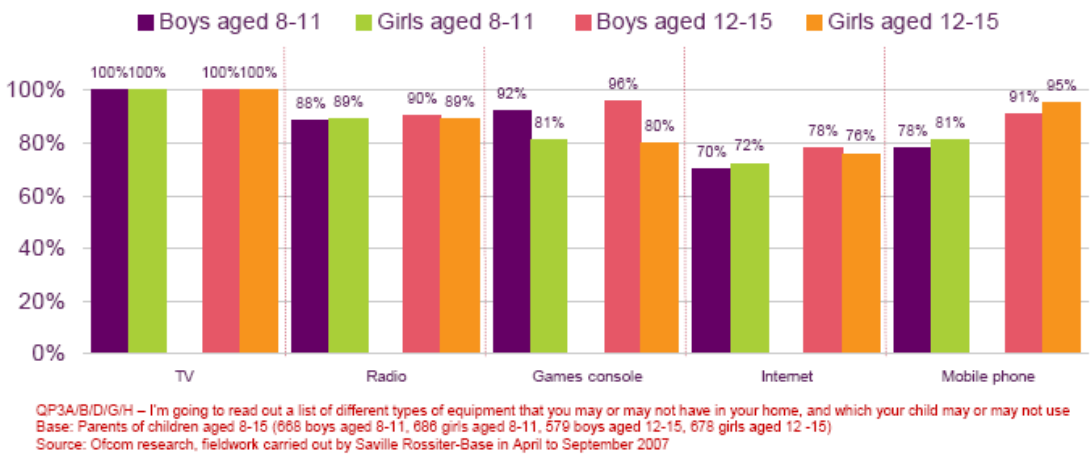


Figure 8 Ownership of key media, age 5 to 15, Children's Media Literacy, Ofcom, 2008

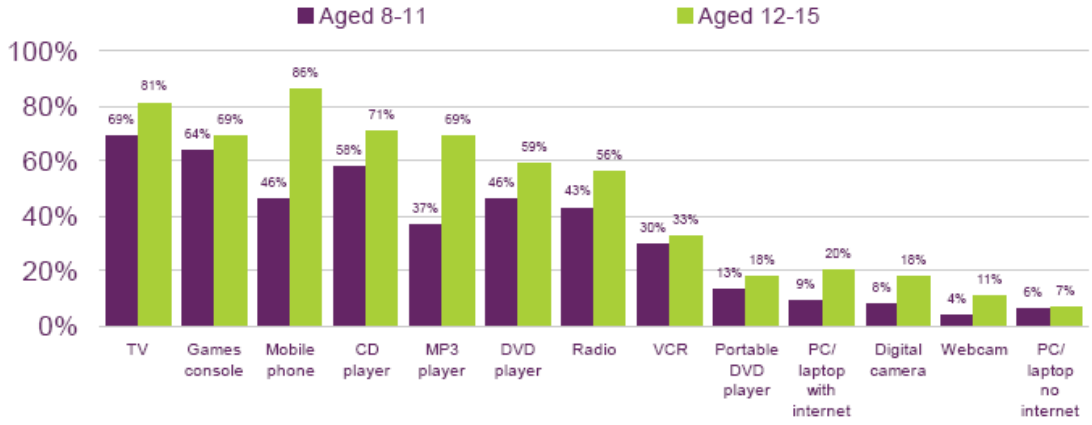
The provision by Ofcom of data showing the access to technology by gender shows boys having greater access to both games consoles and the internet than girls. There is a steady growth in access to all technologies from the age of eight. While boys are more likely than girls to have a television in their bedroom, they are also much more likely to use the television in their bedroom as a monitor when playing computer/video games. Three in four (72 per cent) boys with a television in their bedroom use the television to play computer/video games, compared to less than half (44 per cent) of girls with a television in their bedroom.



QP3A/B/D/G/H – I'm going to read out a list of different types of equipment that you may or may not have in your home, and which your child may or may not use
Base: Parents of children aged 8-15 (668 boys aged 8-11, 686 girls aged 8-11, 679 boys aged 12-15, 678 girls aged 12 -15)
Source: Ofcom research, fieldwork carried out by Saville Rossiter-Base in April to September 2007

Figure 9 Ownership of key media, by age and gender, Children's Media Literacy, Ofcom, 2008

Children have much greater access to games consoles in their bedrooms than the internet., however Ofcom's data shows there has been a greater increase in children's use of the internet in comparison to games consoles in 2005 and 2007, the use of games consoles has remained almost the same.



QP3A-M – I'm going to read out a list of different types of equipment that you may or may not have in your home, and which your child may or may not use
Base: Parents of children aged 8-15 (1354 aged 8-11, 1357 aged 12-15)
Source: Ofcom research, fieldwork carried out by Saville Rossiter-Base in April to September 2007

Figure 10 Media in children's bedrooms, by age, Children's Media Literacy, Ofcom, 2008

As both adoption of broadband and computing power increases, and as the use of the 'Cloud' increases (the move towards online storage of content or files rather than on computer hard drives or movable storage drives), there is likely to be an increase in the playing of immersive games and a growth in the number of children visiting virtual worlds. South Korea, for example, where there has been a high take of up broadband, shows online games constitute over 60 per cent of the total games market, with PC being 22 per cent and handheld games being 21 per cent. The latest versions of games consoles have online capability, therefore the distinction between on and offline gaming is likely to begin to blur (Kerr, 2006: 53). Massively Multiplayer Online Gaming began in

earnest, in the 1990's with *EverQuest, Asheron's Call*, and *Ultima Online*, released in 1997, followed by *The Sims, Star Wars Online*, and *Final Fantasy XI*. "The game which has the greatest number of subscribers is certainly *Lineage*, a Korean game, which claims more than four million permanent players and two million episodic players. World of Warcraft, launched in 2004, already has more than five million users spread all over the world" (Natkin, 2006:56).

Gaming figures can be problematic for several reasons. Firstly figures are often released from either a national, European or American perspective. The number of players also rises and falls in a much more fluid way than with, for example, a television series. The organisation or marketing company releasing the figures may place emphasis on particular demographics or include related products or services. This results in a range of slightly different figures about the same games being quoted from different sources, perhaps at different times, with different intentions. Finally, the numbers of people who are *initially* subscribing to virtual worlds (or games) and those who are *active over time* will change. There will be a high percentage of people who initially register but who fail to create an avatar or subsequently engage in the world or game.

Figure 11 Statistics from NPD, augmented by Dan Miller from the U.S. Congress with figures on membership.

Dan Miller is a Senior Economist on the Joint Economic Committee of the US Congress. Figures released via his blog (June 2008) build on statistics released by American strategy group NPD (who did not include free MMORGS or subscriber figures, which Miller has added alongside).

The UK Guardian technology columnist Aleks Krotoski stated at a recent event on virtual worlds at the London Knowledge Lab that Linden Lab, the creators of *Second Life*, believe 80 per cent of the 13 million + who registered are not subsequently active. Alongside the growth of virtual worlds for adults there has been a similar trajectory for worlds which cater for children and young people. eMarketeer, a company specialising in statistics for marketeers, conducted a survey in 2006 to assess the projected growth of virtual worlds for children and teens, in the USA, aged between 3-18 years of age. They estimated that 24 per cent of the 34.3 million child and teen users in the US would use virtual worlds on at least a monthly basis in 2007 and by 2011 they believed 53 per cent of them would use virtual worlds.

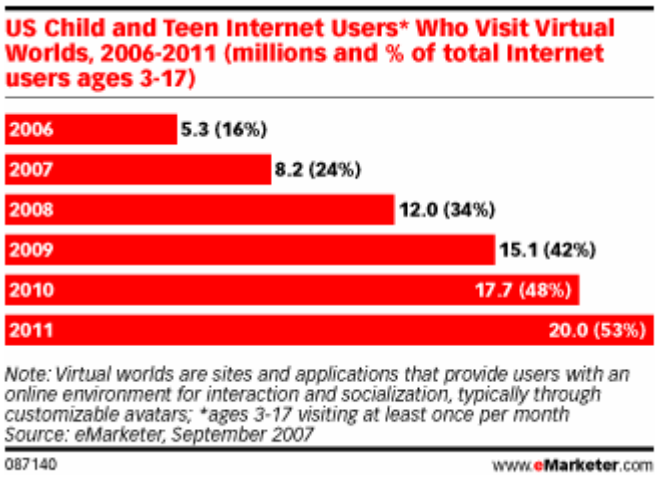


Figure 12 Growth of Child and Teens in virtual worlds

A BBC News report indicated there were 158 virtual worlds for children either launched or in development (9 May 2008). The list was drawn up by Joey Seiler, Editor of Virtual World News. The growing popularity was based, according to Seiler, on three things – friends, freedom and fun.

Figure 13 Registered users, virtual worlds for children

Nic Mitham, of the online consultancy KZero commented in the BBC News report he expected "to see the first signs of fall-out next year," when companies presently supported by venture capital dries up. "In the place of the more generic virtual worlds will come those allied to a particular genre or interest group," he predicted.

CONCLUSION

Despite its lack of social communication features, the children in this study almost unanimously liked *Adventure Rock*. They appreciated the opportunity to explore a large and interesting 'outdoors' environment (although of course an online world is not going to replace the benefits of outdoor play and exercise). The children were glad that it was free and non-commercial, and their parents were generally pleased that the BBC was developing services of this kind, to introduce children to online environments within a 'safe' zone that they felt they could trust.

Adventure Rock offers some educational benefits to children, encouraging problem-solving, creativity, and computer literacy. Online environments can offer children the opportunity to test and play with different kinds of social interaction, and therefore it was disappointing that *Adventure Rock* was not able to facilitate such experiences. However, it should be noted that *Adventure Rock* is only one of a suite of services offered on the CBBC website: other features such as *MyCBBC* offer an excellent introduction to social networking in a carefully controlled, but not too constrained, way.

The study suggests that BBC Children's should consider ways in which children can be more closely involved in the development of services from the earliest point in concept development – not mere beta testing. Virtual worlds bring the former 'audience' into the media experience more centrally than ever before, and require a rethinking of the formal and informal relationships between children and producers. A new kind of relationship between the BBC and parents also needs to be established. Furthermore, the study found that young users demand to be treated respectfully, such as being given information and an explanation when certain features of a service are not operational.

Adventure Rock appears to be a reasonably successful experiment – a good 'first go' at online environments of this kind, offering both fun and mental stimulation. Inevitably, both technology and user expectations move along quickly, and the young audience will be anticipating more social and interactive experiences from the BBC.

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Further sources of information

- David Gauntlett: Creative research methods: http://www.artlab.org.uk
  Information on creative methods, including YouTube videos outlining the principles of the process.
- Aleks Krotoski: http://socialism.wordpress.com
  Aleks blogs about virtual worlds and her doctoral research on *Second Life*.
- KZero: http://www.kzero.co.uk/blog
  Source of data on users of virtual worlds.
- Ofcom, 2008, *Media Literacy Audit*:
  http://www.ofcom.org.uk/advice/media_literacy/medlitpub/medlitpubrss/ml_childrens08/
- The Social Research Foundation: http://www.socialresearchfoundation.org
  Runs ongoing focus groups in *Second Life*.

The research team

The researchers are based at the University of Westminster's media department, rated #1 in the UK for media and communications research (RAE, 2008).

David Gauntlett is Professor of Media and Communications. His teaching and research is in the area of media and identities, and the everyday creative use of digital media. He is the author of several books, including *Moving Experiences* (1995, 2005), *Web Studies* (2000, 2004), *Media, Gender and Identity* (2002, 2008), and *Creative Explorations: New approaches to identities and audiences* (2007), which was shortlisted for the *Times Higher* Young Academic Author of the Year Award. He produces the popular website about media and identities, Theory.org.uk, and has pioneered the use of creative and visual research methods, for which he has created the hub at ArtLab.org.uk.

Lizzie Jackson worked at the BBC for eighteen years in radio and new media production, with a 'commercial break' in the middle as Managing Director, Soundbite Productions Limited. Lizzie returned to the Corporation in 1997 to subsequently launch the BBC's message boards, live chats, and chat rooms as Editor, Online Communities and oversee the BBC's internet safety initiatives as Editor, ChatGuide and Internet Safety. She is a founder member of eMint, the UK Association of Online Community Professionals and was named as one of the 100 Innovators of the Internet Decade in 2004.

Jeanette Steemers is Professor of Media and Communications. Her teaching and research is in the area of media policy and the media industries. Her book publications include *Changing Channels* (1998), *Selling Television* (2004) and *European Television Industries* (2005). She is currently running a two-year research project on the changing production ecology of pre-school television in Britain funded by the Arts and Humanities Research Council (AHRC).

Arts and Humanities Research Council: Each year the AHRC provides approximately £100 million from the Government to support research and postgraduate study in the arts and humanities. In any one year, the AHRC makes approximately 700 research awards and around 1,000 postgraduate awards. Awards are made after a rigorous peer review process, to ensure that only applications of the highest quality are funded. Arts and humanities researchers constitute nearly a quarter of all research-active staff in the higher education sector. The quality and range of research supported by this investment of public funds not only provides social and cultural benefits but also contributes to the economic success of the UK. See www.ahrc.ac.uk.

BBC Future Media & Technology focuses on what comes next for the BBC in terms of technology and services. The department concentrates on innovative platforms and content and is involved in the development of search, navigation, metadata, on-demand, mobile and web based applications including the emerging BBC i-Player on demand service and Web 2.0 initiatives, as well as the BBC Open Archive. FM&T aims to keep the Corporation on the cutting edge of the industry at a time where the boundaries between producers and audiences are fast disappearing and the entire landscape of the large scale broadcaster is changing dramatically.

The AHRC/BBC Knowledge Exchange Programme is led from within the BBC by the Innovation Culture team. Innovation Culture provides a central support resource for a wide range of BBC divisions, making it more effective to undertake collaborative work. It forges partnerships outside the BBC as well as internally enabling the transfer of ideas, knowledge and prototypes into the business. By encouraging best practice across the whole of the BBC's Future Media and Technology (FM&T) division, of which BBC Research and Innovation is part, the team brings a strategic overview to a range of innovation techniques. It also drives forward a variety of early stage research projects in key strategic areas, bringing a user centered design approach to emerging technology practice.

BBC Knowledge Exchange blog: http://www.bbc.co.uk/blogs/knowledgeexchange
This blog is the place to go for any new announcements, outputs, musings from the KEP team. There will also be posts from project partners involved with the funded projects.

beebac: http://beebac.welcomebackstage.com
beebac is the online knowledge network for the BBC and academic community . It is a place to find likeminded individuals and a resource for ideas, projects and people. It enables you to find people and projects you want to be involved with, explore areas of mutual interest and exchange ideas and resources.

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