

## DISCUSSION PAPER

# TELEVISION, DIGITAL MEDIA AND CHILDREN'S LEARNING

**Dr Patricia Edgar** was Chair of the Children's Programme Committee of the Australian Broadcasting Tribunal and founding Director of the Australian Children's Television Foundation. Dr Edgar now chairs the World Summit on Media for Children Foundation.

**Dr Don Edgar** was the founding Director of the Australian Institute of Family Studies and is a member of the Victorian Children's Council.

Their recent book – Don & Patricia Edgar (2008), *The New Child: In search of smarter grown-ups*, Wilkinson Publishing, Melbourne – discusses in detail the major changes in children's lives related to media and technology, family and social values.

This paper was commissioned by the VCAA to promote discussion about the important issue of children's learning and development through electronic media and new technologies.

The statements and opinions in this paper are those of the authors, Dr Don Edgar and Dr Patricia Edgar and do not necessarily reflect the views of the Victorian Curriculum and Assessment Authority and/or the Victorian Government.

## INTRODUCTION

Modern technology has transformed the way children learn and interact with their environment.

The Victorian Curriculum and Assessment Authority (VCAA) is responsible for the development of the Victorian Early Learning and Development Framework 0–8 in partnership with the Victorian Department of Education and Early Childhood Development. This paper was written in response to an invitation from the VCAA to set out the writers' views on the issue of the potential of media technology to improve children's learning.

Part A of this discussion paper examines how children use media technology and the educational value of television, computers and electronic learning aids. Technology is available now and in the immediate future that can be used to enhance children's learning.

Consideration is given in Part B to the funding and regulatory issues needed to capitalise on the potential of technology to transform development and learning for children.

The definition of media technology covers radio and television broadcasting on in-house sets, iPods and portable players or on mobile phones; films and TV programs, broadcast or on DVDs; computer games on PCs, laptops or hand-held modules; interactive games on the internet; and communicative media such as chat rooms, mobiles and email.

The paper focuses on the youngest Australians, those aged up to eight who are significant television viewers – in fact children under the age of four watch more television than anybody else in the household. But they are currently often not well served by television.

# **PART A –Today’s technology**

## **1. CURRENT SITUATION**

Television, film and computer games are already playing a role in educating young children but there is significant potential to capitalise on their ability to enhance development and learning.

Media technology is pervasive and covers:

- radio and television broadcasting on in-house sets, iPods and portable players or on mobile phones
- films and TV programs broadcast or on DVDs
- computer games on PCs, laptops or hand-held modules and interactive games on the internet
- communicative media such as chat rooms, mobiles and email.

This paper focuses primarily on children under the age of eight who are less involved with the communicative media.

Research suggests most children acquire many of their media literacy functional skills early and without much formal instruction.

Children under age 6 already have good media skills – by themselves:

- 74% can turn on the TV
- 58% can use the remote
- 46% can put on a video or DVD.

A recent Australian Communications and Media Authority survey of media use (ACMA, 2007) found that children aged 0-4 spent:

- 154 minutes per day viewing free-to-air television (127 minutes on commercial channels)
- 194 minutes per day watching subscription TV.

That makes a total viewing time average of 5 hours 48 minutes per day for the youngest children who are the heaviest viewers of television in the family. Programs made for these children are often inadequate and the children are regularly viewing adult programs for much of the day.

Comparable figures for 5-12 year olds were:

- 130 minutes per day viewing free-to-air
- 160 minutes for subscription TV.

This represents a total viewing time average of 4 hours 50 minutes per day. This average is arguably too much for young children who need a variety of physical and social experiences for healthy development. Averages also hide the extensive viewing by children at the upper limit of the normal distribution curve that takes up a large proportion of a child’s day.

The Australian Institute of Family Studies’ Longitudinal Study of Australian Children (LSAC) provides an indication of variations in media use by different social groups in Australia. For example:

- four-year-old children of parents with a higher education spend less time watching TV than those in low education households
- girls watch less than boys
- children watch 9-15 minutes more TV per day if the mother is not employed
- children in one-parent households watch more than those in two-parent families.

Between 2000 and 2005, young children's use of computers and the internet rose from 7% to 23%, with children showing a strong preference for educational interactive games. (*Children Now Report*, p. 10).

The latest figures on computer-based games come from a survey of 1600 Australian households conducted by Bond University for the Interactive Entertainment Association of Australia (October, 2008). This is a rapidly growing area of media involvement, with:

- 70% of all Australians playing games
- 95% of all children aged six to 10 playing games
- 88% of Australian households owning a games console
- 18% of Australian households owning four
- 1.2 million consoles purchased in the first nine months of 2008
  - TV-based consoles – 43%
  - PCs – 39%
  - hand-held gaming consoles – 18%. (Hill, 2008)

According to the Cartoon Network's *New Generations 2008* survey, since 2004 the number of seven- and eight-year-olds surfing the web daily has jumped from 7% to 22%. (Emily Power, 2008) The 2008 *Norton Online Living Report* said 96% of Australian children now find information for their school projects on the internet.

## 2. OPPORTUNITIES

### **Television**

Television can be a wonderful story-teller.<sup>1</sup> The benefits that flow to children from good storytelling are many and television's learning outcomes need to be considered as part of the 0-8 curriculum. Children have always been drawn to drama over factual children's programming. (SPAA, 2008)

Stories are the glue that binds the community together. They give children a shared purpose, a roadmap for their lives and teach them about their feelings, their tribe, their culture and their place in the world. A cohesive national culture and identity that requires development through education from an early age would not be possible without shared cultural experiences which film and television programs enable. That is why Australian and local programming is important for children.

When done well, television programs can stimulate a child's imagination and open up the infinite opportunities that life presents. Like good books, good television programs can extend children's understanding of their world. Stories are particularly effective in helping children develop emotionally.

---

<sup>1</sup>This section draws on *The Developing Child*, a publication produced by the Children's Programme Committee of the Australian Broadcasting Tribunal in 1980, which was based on a *Children's Programming Report* produced by the Children's Programming Department WNET/13 New York in 1978. This publication was adapted for Australian producers to assist their understanding of the C classification for children's productions and became the underlying philosophy for programs produced by the Australian Children's Television Foundation during the 20 years Patricia Edgar was Director.)

In Howard Gardner's terms they develop their inter- and intra-personal intelligences. Several studies have demonstrated, for example, the strong link between *Sesame Street* and children's readiness for kindergarten, regardless of socio-economic status, and those effects can last well into high school. In more recent years, *Sesame Street* has gone beyond the basics of number and the alphabet to incorporate elements of Gardner's 'multiple intelligences'.

Children will watch good programs repeatedly, and keep watching them as they grow older, learning different things each time because they can engage with quality content in increasingly sophisticated ways. The young brain's plasticity, its capacity to learn through repetition and reinforcement and the forging of new connections, make good media experiences a potent learning and developmental tool.

Play is important in children's emotional development. A young child can try out roles not yet possible in the real world; television can expand their world of play and take them to places they could not imagine. The 0-5 age group is moving from a self-centred view of the world to a more social outlook, so observing the experience of others in stories on television can enhance their understanding of their world. Preschoolers are also forming their personal style, their sense of identity within their family, in a sex role, outside the family and within an ethnic or racial group. Television programming feeds into this emerging social-self and can be used to present a wide range of role models and images that show different cultures, styles and environments.

Good children's television comprises programs made especially for children that reflect the complexity of the emotional changes within the age group and honestly deal with conflicts that such diversity demonstrates. These programs can help clarify emotions, reflect anxieties and hopes and recognise problems while suggesting solutions to overcome hardships and worries. In their early years preschoolers need to be hearing and seeing stories which help them work through their fears in a positive manner. They need to learn to share, to appreciate others, to know that jealousy, greed and anger are feelings we all have that we must learn to control. They are on a journey to discover how to connect emotions and motivations of characters to their actions. Zimmerman (2007) says programs such as *Blue's Clues* 'cleverly use the medium of TV to expand not only the child's understanding of, but also his or her interaction with the real world'. Television is well placed to provide such experiences.

Programs such as *Barney & Friends*, *Sesame Street*, *Blue's Clues*, *Dora the Explorer* and others claim to combine more than 100 potential teaching elements and enhance children's performance in social skills, imagination, singing and dancing through active engagement with program content. Cognitive gains include numbers, letters and vocabulary; social learning such as taking turns, sharing and cooperation; physical improvements in small and large motor skills; and emotional lessons in dealing with anger, disappointment, feeling sad or happy. (Weber & Singer, 2004).

Unlike some curriculum and media approaches which rigidly separate what experiences are appropriate for infants compared with toddlers and older children, the evidence is that quality TV programs and games can be designed for three to eight-year-olds and understood by them at different levels. The younger ones take in messages that match their level of cognitive development and older children interpret them at a more sophisticated level. Technology makes it possible to design programs that are not only appropriate to a particular age group, but also to different developmental levels within that age group. The computer is inherently adaptable to different learning styles, but there is as yet little evidence of that adaptability being harnessed in the cause of more individually appropriate learning.

## ***Educational games***

Gaming has come a long way over the past decade. Early games were played on a dedicated video device; now platforms range from personal computers to small hand-held devices. Equipped with user-friendly screens, mobile phones, PDAs, graphing calculators, GPS receivers, MP3 players, digital cameras and watches can be used to play games on-line or off-line. This increased accessibility has helped create a huge explosion in gaming, leading to many young gamers drifting away from television to spend time with interactive play.

Games can be used with positive results to assist learning from 3-8 but so far there have been relatively limited attempts to integrate game-playing into the classroom in Australia.

There are games being sold to teach times-tables, numbers, letters, reading and comprehension. Such materials can be overtly didactic with content that is little more than drill with graphics rather than carefully and well developed curriculum content. Puzzle games, however, are now beginning to realise the promise of technology and learning. For example, Nintendo's *Brain Age* and *Big Brain Academy*, based around maths, logic and visual exercises are research-based games that develop skills and they are regarded as quality entertainment.

Quality educational games can be developed for preschoolers around shapes, colours, numbers, counting and reading. Games are particularly useful for children with learning disabilities and enhance hand and eye coordination. (Novak and Levy, pp.222-3).

There is now, however, a growing body of evidence demonstrating that narrative-based games are effective and valuable tools for learning. Narrative-based games have an enthusiastic following with children from a very early age and across all ages.

The iterative strategies developed through game-playing include the following elements:

- children seek information and piece together data from many places
- they make decisions quickly which have clear consequences
- they become experts at multi-tasking and parallel processing and learn to collaborate with others over a range of networks.

Game players can acquire these skills at a very early age. Four- and five-year-olds play such games as *The Sims* (the most popular computer game ever made, which is essentially a 'living dollhouse') and *Roller Coaster Tycoon* where the basic goal is to create a successful theme park.

*Children Now* sums up the research on children's use of interactive media saying that children who use computers show superior spoken communication and cooperation, can play better within a set of rules, share leadership roles, take turns, and initiate interactions. Children learn to use more complex speech patterns and higher levels of verbal communication because they tend to narrate what they are doing as they play. They have better phonological awareness, tell more sophisticated stories and have better writing skills. Interactive story books allow children to control the story and ask for help and get it. (Cassell, 2004; Foster, Erickson et al 1994; Ryokai et al, 2003; Chera & Wood, 2003; Lewin, 2000)

For most children, using the computer does not isolate them but helps to connect them with others. Computer activity motivates and produces a longer attention span and enhances self-concept and attitudes to learning because it insists on mastery from level to level.

In 2006, the Federation of American Scientists issued a statement supporting the use of computer and video games in classrooms:

*“...educational games are fundamentally different than prevailing instruction because they’re based on challenge, reward, learning through doing and guided discovery in contrast to the ‘tell and test’ methods of traditional instruction ... Games offer attributes important for learning – clear goals, lessons that can be practiced repeatedly until mastered, monitoring learner progress and adjusting instruction to learner level of mastery, closing the gap between what is learned and its use, motivation that encourages time on task, personalisation of learning, and infinite patience.”*

There is no research with pre-schoolers that documents their capabilities with technology and the potential for learning games can engender. But there is an interesting case study reported by Professor James Paul Gee, Professor of Reading, University of Wisconsin, USA:

*“Gee described his nine-year-old son's progress with technology which began at age three with him sitting on his father's lap with one of the Winnie the Pooh books on the computer. The father would control the mouse and the son would tap the screen. The three-year-old soon learnt how to use the mouse, the conventions of a computer, how the screen worked and that some things on the screen were clickable. Eventually the child wanted to take over much more control of the game itself.*

*“Gee bought his son two plastic Pokémon figures from the supermarket; he was given a few Pokémon books, activity books and sticker books which introduced him to the whole Pokémon universe, including the game. They got him a Game Boy but because the boy couldn't read he was unable to play. His mother sat with him and they played the game together. Pokémon motivated the son very strongly to want to read the names of the Pokémon, play the game by himself and do a lot more on the Internet.*

*“By the end of his first year at kindergarten the boy was able to read. He became interested in evolution because of the evolution of Pokémon characters. This led to his dinosaur craze and he went on to other games. By the age of seven in First Grade, the son wanted to play Age of Mythology. His father told him he felt it was over his head. The response was that there were several children in first grade playing it. And in fact there were. He and his friends got books out of the school library – fifth and sixth grade books. They went onto a lot of web sites about mythology and wanted to visit museums. By age nine the son started to play Yu-Gi-Oh on Game Boy. To play you need to read the back of the card to negotiate what you are going to do; this game playing is done in a very social setting.”*

Marc Prensky, *Don't bother me mom - I'm learning!*, pp. 161- 167)

Children up to age eight are learning many cognitive skills which can be assisted by games, including:

- attend and concentrate
- associate words and symbols with objects
- perceive and discriminate
- identify similarity and difference
- classify objects
- see order or relationships
- develop concepts – space, size, shape
- explore and be curious
- manipulate
- use creative imagination.

Mark Prensky (2006) shows in his book *Don't bother me Mum, I'm learning!* how games help cognitive development in progressively complex ways.

Prensky says games teach children about:

- cause and effect relationships
- long term winning versus short term gains
- creating order from seeming chaos
- second order consequences
- complex system behaviours
- counter-intuitive results
- using obstacles as motivation
- the value of persistence.

Learning and Teaching Scotland (LTS) has analysed the effect of playing a brain-training game every day on the dual-screen handheld Nintendo game console. The study, which involved more than 600 pupils in 32 schools across Scotland, found the game improved pupils' concentration and behaviour with less time needed to complete the tests. The improvement in the games group doubled that of the control group. LTS said the results offered the first independent, academic evidence that this type of computer game could improve attainment when used in an educational context. (BBC News 25/9/08, <http://news.bbc.co.uk/go/pr/fr/-/hi/scotland/7635404.stm>)

As a lucrative industry, games are developing apace. As the production values of video games have improved over the years, both in visual appearance and depth of storytelling, the creators have produced more and more lifelike, complex games that push the boundaries of the traditional gaming genres and make them an increasingly important communication, entertainment and educational medium.

Through such games young people are learning how to play, express themselves and collaborate in large-scale communities. But according to Professor Henry Jenkins<sup>2</sup> from the Massachusetts Institute of Technology there is another skill often missing in games – judgment. Few children ask about the motives or accuracy of the way games depict the world or the ethics underlying the choices both game players and game creators are making. This is a subject for a media literacy program.

Another area of exponential growth is that of social networking and virtual worlds. Social networking is used by children as young as 12 months old who use virtual communication tools such as webcams to interact with parents or others who are in a remote location. On [www.superclubsplus.com.au](http://www.superclubsplus.com.au), which is popular among six- to twelve-year-olds, children can build their own web pages and talk in forums and by e-mail, with online mediators monitoring the site and ensuring that content is age appropriate.

It is estimated that more than 200 virtual world projects are in development globally. (McIntyre, 2008) Children love the idea of virtual playgrounds, places where they can create their own identities, or avatars and interact with others in new digital environments.

---

<sup>2</sup> Professor Jenkins is the principal investigator of a project on *Games to Teach*. This project is an interdisciplinary collaboration across the humanities, sciences and engineering disciplines, developing a series of conceptual prototypes for games to teach science and engineering subjects.



### 3. ROLE OF THE FAMILY

The family is the most significant context for early learning and the home is a media-saturated environment. Parents are doing their child no favour by keeping them away from the internet. Technology is part of a child's life and learning today and is a growing part of their identity, connectedness, community participation and future civic engagement.

Given the recent research on the significance of learning experiences in the early years for brain development, any curriculum for children up to the age of eight must place a heavy emphasis on informal learning in the home and the ways family members mediate the impact of media content and media usage by young children. Whereas access to quality child care and pre-school programs is unequal, access to the mass media is ubiquitous.

Increasingly, television, videos and computer games are used as babysitters as parents have become two-income households, with less time for parenting. Single-parent households have increased; there are fewer siblings and neighbourhood friends so media have become a companion for more hours in the day than ever before. (Edgar, 2008) The potential of media is lost if children are left to observe commercialised programming that makes little sense to them but is, nonetheless, shaping their values and behaviour.

At this critical age their brains are being wired and re-wired, not just through parental words and actions but through the repeated images, patterns, sounds, music, stories, emotions and behaviour they see on the screens in their homes. The new digital media are shaping children in ways their parents could never have imagined.

Repeated research emphasises that children learn most when their parents or other adults 'mediate' what they are seeing or doing, whether that is on the TV screen or in the kindergarten classroom. (Dens, Pelsmacker & Eagle, 2007; Buijzen & Mens, 2007; Evans Schmidt, 2006; Barr, Muentener & Garcia, 2007)

The main point about learning via the media is much the same as for any other mode of learning: assistance from a parent, carer or teacher needs to be 'scaffolded' – in Vygotsky's terms, targeted at the learner's 'Zone of Proximal Development', which is the difference between the child's actual level of development and the level he or she could achieve with the assistance of a more competent adult or peer (see Berk and Winsler, 1995).

In the early years children naturally love to learn as they love to play and appropriate video and computer games can very effectively combine these experiences. Pre-schoolers are inducted into many forms of technology before they can read, write or even talk clearly, particularly if they have older siblings. With the right software there are gains for pre-schoolers in intelligence scores, nonverbal skills, manual dexterity and long-term memory and there are better learning gains from home use of interactive technology compared with limited use at school. (Calvert et al, 2005; Lewin, 2000; Labbo & Kuhn, 2000; Haugland, 1992; Van Scoter et al, 2001; Frei, Su, Mikhak & Ishii, 2000; Siraj-Blatchford & Siraj-Blatchford, 2001)

Good programming can teach valuable lessons about living in a community. Children need to learn that they are part of a group; they can't always win and life is not a competition, that trying and effort are admirable. They need to see human endeavour at its best, not just the side that produces conflict.

Parents and early childhood educators can control and regulate the amount of time spent watching television or on the computer, guiding children towards a balanced, responsible use of technology. Censorship or banning is not effective because children need to learn how to use new technologies to become effective citizens in the digital age.

An oft-expressed concern is that of the link between children's viewing of violent television and computer games and aggressive behaviour (Clements, 1994; Haugland & Wright, 1997; Wartella, O'Keefe & Scantlin, 2002; Calvert, Stron & Gallagher, 2005; Van Scoter et al, 2002;. Lewin, 2000, Luckin, Connolly, Plowman & Airey, 2003). Such causality is, however, disputed across many research studies. It has some support if viewing hours are high (Bushman & Heusman, 2001) but other family-related factors are at play and children are just as likely to be influenced by positive social messages in television programs, learning and internalising messages about friendliness, altruism, cooperation, self-control, delay of gratification and the reduction of stereotypes. (Fisch, 2004)

Children are not just passive users, victims of media effects. They are, today, active users eagerly exploring the new media technologies to learn about the world and express themselves in new ways. The goal must be to help children make informed choices about how they use the media and for how long, and how much they can trust and be informed by what they see. This is a preparation for a citizenship model of media literacy. (Penman & Turnbull, 2007, p. 15)

If the task of early childhood is defined as 'learning to find your way around in the world', then the mass media and the tools of modern technology have the potential to help in this task by taking every child well beyond the intimate confines of the family home to a wealth of 'life experiences' to discover who they are in relation to the wider human family and their social and physical environment. Media provide visual, verbal, emotional, social and even physical modes of dealing with the world. They also offer a pervasive set of commercial values which may not be what is needed for citizenship in the digital age.

The internet age has ushered in 'a powerful new combination of technological, social and economic trends which has placed children and youth at the centre of digital politics, commerce and culture'. (Wartella & Jennings, 2000, p. 4)

This is a big step forward from previous discussions about media literacy that have focused on the basic technological know-how needed to use it, a mechanistic, analytical approach, and a fairly negative form of critical understanding of the processes of media production.

Ofcom, the British communication regulatory authority (Buckingham, 2006) calls for media literacy in three main areas, covering children's ability to:

1. *Access* the media – the skills needed to gain access to media content
2. *Understand* the media they access – as they develop, children must learn the difference between reality and representation, how to cope with upsetting emotional responses to media content, and to make critical judgments about TV violence and advertisements.
3. *Create* – a neglected and little known aspect of children's use of the media, even though children's own production of media content is rapidly expanding with new technology such as mobile phones and website interactivity. (Demos report *Video Republic*, Hannon, Bradwell & Tims, 2008)

This is a useful framework around which to build a national approach to the development of media literacy in all young Australians.

However, it is necessary to now go further and add a fourth dimension:

4. *Learn through* the media - this involves having parents, carers and teachers build on the content of what children view to enhance child development and learning in the areas of physical growth and health, language and communicative competence, self-understanding and interpersonal skills, cognitive skills and general knowledge.

To fully realise this potential of the media as a tool for learning will, however, require the development of new media content that will serve as both a resource and an agent in the cause of a meaningful education revolution. New media content is needed to deliver the kind of high-quality television programs and games that provide rich learning experiences and so further the objective of universal access to high-quality education for early childhood development.

Together, these four areas provide the basis for a forward-looking framework that will address the emerging as well as existing potential of the media as a tool for learning.

## **PART B – Regulatory and funding issues**

### ***A whole-of-government perspective***

#### **DISCUSSION**

This paper has been prepared at a time of widespread change within the Australian film and television industry. The Australian Communication and Media Authority (ACMA) is undertaking a review of its Children's Television Standards. It has recently launched a website to help people participate in and understand digital media services – [www.acma.gov.au/medialiteracy](http://www.acma.gov.au/medialiteracy).

The Australian Broadcasting Corporation and the Special Broadcasting Service are also undergoing reviews, taking into account convergence and digitization. The Australian film Finance Corporation, the major funding bank for the industry has been merged into a new body, Screen Australia.

The Australian Government's broadband and digital plans, the role of ACMA and the reviews of the ABC and SBS are as central to the education revolution as are the government's plans for reform of the education system for early childhood.

It is suggested that the importance of media in the education of children has not been well recognised because there has not been a whole-of-government perspective linking education policy and communication policy, although now the need for computers and for fast broadband connections has been accepted.

Health policies for children have not been seen as a core aspect of early childhood education. Child care funding has been premised on helping mothers in employment, not seen as an essential domain of early childhood development and learning.

Some states, such as Victoria, have appointed a Minister for Children to attempt better cross-departmental coordination and other states have a Children's Commissioner. Such developments need to be carried through nationally with the appointment of a federal Children's Media Commissioner who would advise governments and liaise with industry, education and community groups in the best interests of children and oversee the conduct of research on how the media affect children's development and learning.

#### **FINDINGS**

1. Communication and technology policies should be seen as integral to the nation's education policy.
2. The Early Years Learning and Development Framework (ELDF) should have a clear focus on informal learning through media and technology.
3. Media education should be expanded beyond a narrow focus on media literacy skills to include the content and learning potential of all forms of the new digital media.
4. Rather than taking a narrow focus on students' school readiness, or their later productivity the ELDF should focus on the sort of citizens we need our children to become.

- The government should appoint a Children’s Media Commissioner to develop a framework for all government activity associated with children’s education, health and welfare with media at their core.

**Updated regulations for the digital age**

**DISCUSSION**

*Commercial television*

For thirty years, Australia has had a system requiring Children’s Television Standards (CTS) which are currently under review. The overall goal of the CTS is ‘to promote Australia’s identity, character and cultural diversity’, by requiring programs specifically designed for Australian children and protecting them from ‘harmful effects’. In brief, the CTS require that commercial TV networks broadcast annually 260 hours of children’s programs (C) and 130 hours of pre-school programs (P). Half of these must be first-release Australian content; all P programs must be Australian. Licensees must broadcast at least 96 hours of first-release Australian C drama over a three-year period, plus eight hours of repeat Australian drama.

Given the enormous number of hours Australian children are watching (averaging over 5 hours a day), not much of it is ACMA-approved C or P material. Even the programs classified as P or C leave much to be desired.

*ABC and SBS*

In October 2008 the Australian Government called for submissions to review the future roles of the Australian Broadcasting Corporation and the Special Broadcasting Service. (*ABC and SBS: Towards a digital future. Discussion paper*, [www.dbcde.gov.au/abc/sbsreview](http://www.dbcde.gov.au/abc/sbsreview))

The government is seeking to clarify the vision and direction of the ABC and SBS as creative and responsible public broadcasters in the era of convergence and digitisation. This review will include an examination of children's programming and the discussion paper expects ‘the national broadcasters could play an enhanced role in children's programming’. At the Australia 2020 Summit the final report stated, ‘the ABC would have a specific education role in classrooms and across all industry sectors. This should be supplemented by the ABC having a separate children's channel.’

*Programming for children*

In October, 2008, Australian P classified programs broadcast on the commercial networks included:

Commercial networks	ABC
<ul style="list-style-type: none"> <li><i>Puzzle Play</i> (Ten)</li> <li><i>Here's Humphrey</i> (Nine)</li> <li><i>Disney Playhouse</i> (Seven)</li> </ul>	<ul style="list-style-type: none"> <li><i>Play School</i></li> <li><i>Bananas in Pyjamas</i></li> <li><i>In the Night Garden</i> (UK)</li> <li><i>Sesame Street</i> (USA).</li> </ul>

Other programs classified and approved by ACMA as fulfilling their criteria for programming suitable for pre-schoolers, but not screened in October, include:

- |   |   |
|---|---|
| <ul style="list-style-type: none"> <li><i>All for Children</i></li> <li><i>For Children</i></li> <li><i>How2 with the Hooley Dooleys</i></li> <li><i>New McDonald's Farm</i></li> <li><i>Raggs</i></li> </ul> | <ul style="list-style-type: none"> <li><i>Rock it</i></li> <li><i>The Fairies</i></li> <li><i>Hi 5</i></li> <li><i>Arts Alive</i></li> <li><i>Bambaloo</i></li> </ul> |
|---|---|

The Australian pre-school programs on commercial networks and the ABC vary in quality and in the effort made to produce them, but generally speaking their education curriculum is very thin and the content is wearily formulaic, with on-screen adult hosts talking down to children and behaving like children.

Production values are basic; the scripts lack humour, originality and imagination. Across the shows the content is remarkably similar. The hosts sing songs and demonstrate crafts such as walking barefoot in paint or constructing a clock. The stories are read straight from books and not read very well. Any adult able to invest 30 minutes to be with a child or group of children would be better off reading a story themselves or guiding play. These shows do little to enrich, stimulate and excite the imagination of children as television is capable of doing.

An ACMA classification lasts for five years and the pattern is that once a program is approved, it remains in production. The other important consideration is that P classified programming represents only one half hour each week day of programming for children on a commercial television channel. So for most of the time on commercial TV, the pre-schooler, the heaviest viewer in the family, is exposed to programming that was not made specifically for them and the chances of them fully understanding what they are viewing are negligible.

With ACMA's review of the commercial children's television standards and the government's review of the ABC and SBS there is an opportunity to change the direction for children's media, implementing reforms that will form part of the educational revolution. It is time the objectives for children's media and their education were brought together to enhance childhood learning.

Australia has a system of regulation and subsidy to encourage the production of new television programs for children. The commercial networks – Nine, Seven and Ten – are regulated by the Australian Communication and Media Authority (ACMA). ACMA administers Children's Program Standards (CTS), Australian Content Standards and sets quotas.

In prescribing CTS, the legislation explicitly identifies several areas to be addressed in relation to children. These are:

- the times at which children's programming should be broadcast
- how programs televised during children's viewing time should be classified
- the requirement for Australian programming for children.

The CTS was devised 30 years ago and have been passed on from the Australian Broadcasting Tribunal to the Australian Broadcasting Authority to ACMA. The standards were drafted for a different era and were reviewed with a view to ensuring they remain effective within a significantly changed media landscape.

A draft paper released for comment (ACMA media release 105/2008 – 27 August) has proposed few changes and deferred an examination of the future digital environment and its impact on the standards. ACMA is flagging an idea that classification of programs be undertaken by 'a person or body appointed by ACMA'. The idea could have merit if the person or body were to be associated with the ELDF, with powers to review programs currently classified.

The relevance of the quotas and the nature of programming currently being accepted under the CTS, needs an in-depth review. The history of Australian children's television policy demonstrates:

- that while regulation (the CTS) is a pre-condition of the development of quality children's programs within the commercial broadcasting sector, regulation alone is not the complete answer – regulations need continual monitoring to ensure objectives are met as circumstances change
- quality will not be met by the free market – Allan Fels, then Chairman of the Australian Competition and Consumer Commission made the case for cultural protection of children's television in the context of competition policy at the Australian Children's Television Foundation (ACTF) 20th Anniversary Symposium in 2002:

*'It would seem that the arguments that relate to market failure with regard to Australian programming in general apply even more for children's programming (there is also a further commitment that to a degree children's television can be seen in a broad sense as part of the nation's education policy). It seems reasonable to assume that specific programs targeted to children, especially expensive to produce children's drama, will not be produced in the absence of regulatory requirements... The combination of minority audiences, advertising restrictions and relatively high cost make children's programming commercially doubtful for the free-to-air broadcasters. Consequently it is no surprise that these broadcasters will try to minimise programming costs and this is likely to be reflected in the quality of the programs.'*

- the best children's media programs will not necessarily pay their way – just as we need to subsidise schools, we need to subsidise the programs that will support the development and enlightenment of children.

It is time to reform the 30-year-old children's program standards under which the commercial broadcasters operate and to ensure that the ABC's programming comprehensively meets children's social and educational development needs. These objectives will be best achieved by bringing together media and education policies under a coordinated federal government initiative.

## **FINDINGS**

6. ACMA should revise the Children's Television Standards (CTS) in light of the ELDF and consistent with sound principles of early childhood development and learning. In particular, the objectives of the children's quotas for commercial TV networks should be linked to the National Curriculum Framework.
7. In order to accomplish 6, ACMA should establish a new Children's Media Standards Committee. Its chairperson should be the government-appointed Children's Media Commissioner (Finding 5). The Committee would oversee and approve new children's television programs, computer games and internet provisions for children. The focus should be on quality and value to the healthy social and physical development of children and building on the learning potential of the new media for children's own creativity and control.
8. All videos, games and new media products marketed to parents for use with their children as Educational Learning Aids (ELAs) should be rated by ACMA's Children's Media Standards Committee.
9. Clear guidelines should be developed by ACMA to help parents monitor and use to advantage the viewing and other media activities of their children.

## ***A new interactive educational service for children***

### **DISCUSSION**

The ABC and SBS are independent statutory authorities established by legislation. Their roles and functions are set out in their charters.

The principal function of SBS is to provide multilingual and multicultural services that reflect Australia's multicultural society. SBS has produced few children's programs and has no regular children's television service.

The ABC's Charter states that the ABC should 'provide innovative and comprehensive broadcasting services of a high standard that contribute to a sense of national identity and inform, entertain and reflect the cultural diversity of the Australian community'. It is also required to provide 'programs of an educational nature'.

The ABC is not subject to any classification of its children's programs by an outside authority such as ACMA. Unlike the commercial networks, which produce no specialised children's programming beyond their quota requirements, children's programs fill a large proportion of the ABC's daytime schedule. On any given week-day, between five and six hours of programming is directed at the under eight audience on ABC1 alone – from 6-10.15 am and 3-5.00 pm. Much of this programming is commercially driven, supported by merchandise that is promoted on air and sold in ABC shops.

ABC 2 claimed recently that its children's channel was reaching more children than any of the cable television channels. (Mitchell, 2008) A total of 26% of Australian homes had subscription television by 2006. (ACMA) Foxtel now reaches 30% of Australian homes. These services include the Disney, Nickelodeon, Fox Children and Cartoon Network channels. The ABC has proposed a new ABC digital channel which would carry 50% Australian content and no commercials (if promotions for merchandise and ABC Enterprises are disregarded).

The United Kingdom's regulator, Ofcom has studied the output of Britain's digital children's channels and reported that they show many repeat programs, predominantly animated and from the United States, while first-release indigenous programs by British producers amount to 1% of transmission time. Australia and the ABC are not equipped to do better than Britain and the BBC in meeting Australian children's media needs. The concern is that the ABC's digital channel will transmit repeated programming over many hours. Parents and children deserve a service relevant to their contemporary needs, not more of the same.

A recent call for new programming, *Kids360*, by Film Victoria, the ABC and the ACTF indicates they recognise that initiatives are needed. They are seeking a pilot for 'a live-action non-drama program that will excite, entertain and inspire children across Australia'. Producers are encouraged to create concepts for young people similar to programs created for adults in prime time that are currently being produced in Australia – 'The sky is the limit,' producers are told. 'Think *Spicks and Specs*, *Thank God You're Here* and *Rove for 10 to 14 year olds*.'

The problem is that the brief calls for form over function. There is nothing to guide applicants about what the program should do for children other than 'engage' and 'interact with content'. Emulating adult formats is not an appropriate starting point for the producers of children's programs. There is a need to spell out the content and quality objectives of media designed for children to ensure their best interests are served in health, education and social development, as well as entertainment.



Alongside well-developed scripts and creative development teams, there needs to be an ethical agenda to challenge the pursuit of consumerism and personal gratification which in many programs triumphs over the collective good. Media education is a mutual obligation that must be shared by governments, parents, the community and traditional and digital media because markets alone cannot be relied upon.

In short:

- programs must have educational goals, not goals to sell soft toys or designer clothes
- programs must be trustworthy and put the interests of children as citizens above the interests of profit
- children must be treated as active participants in the production and consumption of their media content
- to be effective children's media must take risks, push boundaries, explore new possibilities, raise new questions, challenge the audience to think and act effectively
- children's media must be multi-platform
- media producers must work in partnership with educators.

Some of the ingredients of a new service could include:

- a virtual world – developed with sound educational principles – on the scale of a Club Penguin and within a distinctly Australian setting
- an interactive games platform with games developed by experienced gamers working with educators
- a YouTube equivalent where children post and exchange their own productions
- a library of the best programs available for children to download and watch at their convenience
- Australian drama series of high quality – durable stories drawn from Australian culture for all child age groups
- A major early childhood programming initiative to be developed as an integrated resource alongside the new national early childhood curriculum. (See Recommendation 12)

## **FINDING**

10. A new children's media service for three- to nine-year olds should be established, which could make a powerful contribution to the formal and informal education of Australian children. The best creative brains in the world of media and technology should be recruited to design and produce quality products specifically aimed at reinforcing the learning and development goals of the ELDF.

### ***Funding an interactive educational service***

## **DISCUSSION**

In its draft paper for a review of the CTS, ACMA put forward a contentious idea. A tradable obligations scheme would allow a network to take on programming obligations of another network to increase the amount of children's programs across a greater number of hours. In a variant of this idea, commercial networks could forgo their children's quota obligations but instead pay a tax that would go to a children's production fund to help pay for the proposed new service for children.

The ABC could be given responsibility for this new service as an outcome of the current review, with strict conditions for funding that requires the ABC to meet the educational

programming needs of the ELDF and produce programs to fit with the proposed media literacy program. The ABC should be required to lead and innovate. It should not be funded to provide a digital service that will recycle dated repeat programming nor should it emulate what the commercial networks already do.

Screen Australia, which invests in children's drama programs, should be given a clear brief about the programming objectives for such a new service. Programs funded should not be required to be simply market-driven.

It would make good economic and educational sense to tie these policy initiatives together to enable the government to invest in a service that meets educational and cultural children's programming objectives. With the broadcasting and regulatory reviews and the development of an early childhood learning framework underway, the timing is right.

## **FINDING**

11. The ABC and SBS should be funded to give higher priority to children's programming and be exempt from marketing such programs and associated products to raise revenue.

### ***A new television program for early learners***

## **DISCUSSION**

In 1989, more than 100 experts from differing fields with an interest in children developed a major initiative for early childhood learning. There were mathematicians, philosophers, scientists, musicians, writers, illustrators, poets, psychologists, sociologists, environmentalists, puppeteers and actors. During three week-long workshops, the ACTF devised a curriculum and characters for a new early childhood series called *Lift-Off*, which would be comprehensive and supported by parents, the community and the schools.

The project blossomed as individuals with different perspectives, knowledge and experience mixed ideas. A program was devised that became an exceptional success with its audience, educators and collaborators – and with the critics. *Lift-Off* was endorsed by all State Directors of Curriculum and the Curriculum Corporation invested in a comprehensive package of materials to support it in schools.

An outreach program developed and stimulated activities with parents, children's service-providers and teachers in all states. A total of \$17 million was invested in the television series alone. It took four years and the program was an immediate success. The plan was to maintain a weekly slot on the ABC to evolve the project into a comprehensive, national early childhood education program. With television at its core, it would involve parents, schools and the community – it was an experiment for children's education unlike any in the world.

But with a change of administration at the ABC, *Lift-Off* was cancelled. Without a broadcast outlet, the project could not be maintained, so a well-developed, comprehensive resource sat on the shelf unseen. An important opportunity to improve the educational opportunities and experience for early childhood was lost.

Australian children need another such project as the basis of their early childhood learning initiative. A national outreach project should be developed alongside a program to bring together parents, youth, elders and children's services ranging from child care, kindergartens and primary schools to family support services. The ELD Framework has to conceive of early childhood development and learning in terms much wider than professionally-provided

services. It needs to build on the wide range of resources, including the power of media and technology that can and do contribute to every child's potential.

## **FINDING**

12. The ABC should be funded to develop and transmit a new program designed around the goals of the Early Childhood Curriculum Framework that would be the core of a community based early childhood project.

## ***Research into the impact of new media on children***

## **DISCUSSION**

ACMA and Australia's media literacy fraternity has an important opportunity to develop a new approach and conduct research that is meaningful and of value to the early learning framework. It would address the content issues flagged above, documenting clearly what children learn from watching and participating in the whole range of digital media.

Despite claims that television violence causes aggressive behaviour and emotional disturbance in children, there are greater risk factors, such as family disruption, violence and poverty in the home, lack of friends and poor performance at school. Parental values and the children's self-esteem mediate what they are allowed to view in the first place and its effect on them. (Edgar, 1977 and Edgar, 2006)

The impact of advertising and the vast market that has emerged to exploit children's preferences from toddlers to 'tweens and therefore parental purchases is clear. ACMA claims however, that the research does not justify any further controls on food and beverage advertising which targets children. This is despite what is known about increased child obesity, the consumption of junk foods, the sexualisation of children and growing anxiety levels in young people (Stanley, 2006; ACMA Media Release 105/2008, 27 August)

It is not easy to research media outcomes, especially with young children. It would be helpful to have well-designed observational studies on what sort of adult content is being watched by children in heavy media households. But when a researcher is present, parents are unlikely to leave the TV set turned on all day or watch unsuitable adult programs.

It is also known that parental reports on how much and what children are watching, or how they are using their computers, are unreliable. Young children cannot be given questionnaires or interviewed on what they have learned from their exposure to the media, although qualitative group discussions might be informative.

A more sophisticated multivariate analyses of large data sets such as the LSAC study is needed that compares high and low achieving groups on a variety of learning outcome measures. The aim would be to assess whether controlling for factors such as family income, parent education and home language, the amount and type of media use has had an independent effect on their development.

There are other requirements:

- More systematic research on the impact of advertising on children's food, beverage, toys and clothing preferences and use, plus how parents react in their purchasing of products for their children – advertisers know which advertisements work so it should not be hard to get better evidence on matters of deep concern to parents and the wider community.

- Observational studies of groups of young children and their reaction to a variety of television programs and video games recorded and analysed – comments, levels of interest, recall of words, actions, images, characters, and carry-over into playing or their demands on parents.
- Experimental studies using specially planned educational programs or segments with developmental goals built in to test the effects on language, cognition, socio-emotional behaviour, interests, curiosity and further exploration.
- Follow-up studies after exposure to such segments, at varying intervals, to see how long the effects last, controlling for whether or not an adult has viewed the program with the child, talked with them about what they have seen, and ‘scaffolded’ the program elements with further learning exercises.
- Controlled observational experiments in child care and preschool settings where teachers use TV programs such as nature documentaries, children’s drama and music or computer games to lead into lessons about wider curriculum goals.
- One-on-one discussions with children about current events, sports, entertainment, nature studies and personalities to identify from where they get their ideas, their sources of information (correct or incorrect) and how they feel about what they know.
- More case studies of the type quoted above by Marc Prensky, showing how young children develop their skills and understanding of computer games, their interpretation of media content and whether parental guidance makes a difference to their media literacy.
- Controlled studies of children in various learning groups, comparing those whose carers or teachers have used television segments and interactive technology to ‘scaffold’ learning to introduce children to information, concepts and techniques from the wider world of media content, with other groups where this has not been part of the learning and teaching techniques used.
- Systematic documentation studies of aspects of children’s media literacy – ranging from simple functional usage skills to understanding of media messages, advertising and persuasion, production techniques, the impact of music and other emotional devices on behaviour, to the creative use by children of new technologies to express their own ideas and imaginative output.

## **FINDING**

13. Government should fund ACMA and other organisations for a concerted research effort to document the links between children’s media use and their learning and development outcomes, in order to improve the effectiveness of the early learning and development initiatives.

## ***Media literacy for adults***

## **DISCUSSION**

Media use is already widespread for all children well before they reach school age. It becomes even more significant as they grow older. Child care centres, preschools and primary schools must all take into account this media experience in their handling of curriculum content.

Educators should encourage the use of appropriate media to take advantage of the rapid learning curve from age three.

Parents need to be involved in the selection of games and in playing with their children as described in the Prensky case above. Games for unsupervised solo play should initially consist of simple image and sound exercises focused more on developing symbolism than winning or losing. Vocabulary is also of prime importance since the brain is ready to absorb new words.

Adults need to spend time with children to teach them how to use the internet effectively to communicate, to find information and to be entertained. They need especially to help children develop a framework and strategies for internet use that will ensure their safety and well-being. In order to do this, adults themselves need to:

- *know* how to locate TV channels, pre-record programs, set up videos and DVDs
- *know* how to use a computer to use the internet as an effective research tool and sift for accuracy and bias; send emails and photos and download tools to create content; use communication technologies with appropriate 'netiquette' and safe practices, including strategies for dealing with inappropriate and unwanted material
- *play* hand-held and computer-based games
- *know* who produces various kinds of programs and the purposes behind programming
- *know* how programs are produced, identify hidden messages and assess commercial messaging
- *differentiate* reportage from advocacy
- *identify* creative possibilities
- *be* active media users, not passive recipients of unsuitable material aimed at the child as a consumer
- *participate* and interact with children in all media-technology experiences by watching and discussing TV programs and playing computer games
- *perceive* media technology as powerful learning mechanisms for children with negative and positive potential
- *understand* that without an ability to use the new technology, children's learning and development will be seriously disadvantaged impacting on their scholastic capacity and work prospects
- *accept* that the old days of chalk and talk teaching are gone
- *appreciate* that children have a new learning power through technology but they have to be taught how to use the computer and other media to their greatest advantage
- undertake teacher training to provide students with support to direct their boundless creativity through new media
- become parental activists, demanding better quality media programs designed specifically for Australian children, protesting about their commercial exploitation, demanding better regulation of all media, including computer games that are designed with educational purposes and consider children's interests.

#### **FINDING**

14. A systematic program in media literacy and media education should be developed and made available to parents, child carers, pre-school teachers and other adults to increase their awareness of the positive potential for children to learn and develop healthily through the use of media and digital technology.

#### ***The digital divide***

#### **DISCUSSION**

Whether or not parents can see the potential learning value of media exposure, and what is called the digital divide are the main barriers to children's media use, apart from television which is universal.

Technology puts a lot of pressure on today's families. It is costly to be connected, to have mobile phones, cable access and the latest iPod. The digital divide is exacerbating inequalities in access to good schooling and other children's services. Many parents are pulled in two ways by the new technology – they fear its negative impacts: passivity, physical inactivity, pornography and cyber-bullying. But they sense that without adequate exposure and skill acquisition their children will be disadvantaged.

This is the modern version of educational inequality, which has always reflected both parental income and their perceptions of the value of education. The most recent OECD comparisons suggest that the education divide is reopening, with 7.2% of children having fewer than 11 books in the home, 12% of children living in households where income is less than half the national median, and psychological problems rising. Income influences what products families can buy, including access to cable TV and the internet.

In the United States,

*“The growing importance of the internet has created a new disparity across class lines in children's access to skills, social networks and intellectual resources. While children with high household incomes enjoy speedy, pervasive access to technology at home and at school (either private or affluent public school districts), others struggle to compete for intermittent access to slow machines that are outdated and erratic.... Those young children without access to the internet ... are considered to be seriously disadvantaged, cut off from opportunities, unskilled for future work, and disconnected from peers.”* (Montgomery, 2007, p. 210)

There are no Australian studies that break down children's media usage by race or ethnicity, but the LSAC data on four-year-olds described above suggest that parental education levels, family income and other factors such as working hours, father absence and number of siblings do have an impact on their viewing patterns and developmental outcomes. As Professor Alan Hayes puts it, 'While social class differences are not evident in early infancy, by six or seven years of age, developmental outcomes are clearly differentiated by parents' social position.' (*The Australian*, 21 October, 2008)

With the global financial crisis impacting on Australia, that income gap may well become wider and public institutions such as children's and family support services, child care centres and pre-schools, local libraries and schools will have to become key providers of access to computers, specialist games, and media literacy programs.

Australia is a rapid adopter of any new technology, but there remains a significant digital divide which the government is currently trying to address. The number of dwellings with access to the internet increased from 35% in 2001 to 63% by the 2006 Census. (ABS, 2006) Nationally, access varies from 66% of households in the major cities to 42% in very remote areas (with just 28% of these remote households on Broadband). The ACT is highest (75%), with South Australia, Tasmania and the Northern Territory lowest (between 28-32%). As well, the top quintile of household incomes has 77% with access compared with only 34% for the lowest quintile household group. Those with post-graduate education are 83% more likely to have access to the internet than those with no post-school qualifications. The unmarried, low-skilled, indigenous and unemployed also have lower access.

An Australian study by the Smith Family found a new digital divide between those who are part of 'the new participatory creative culture' and those who are not. That is, inequality is not

just reflected in relative access to and possession of media forms but a lack of skills and opportunities for using technology for social inclusion. (Muir, 2004)

If the new interactive, creative technologies do actually encourage a new world of democratic citizenship participation (UNESCO), there can be no doubt that children who lack both the opportunities and skills to make their own informed media-related decisions, or to interact with their peers and express their ideas via the new technology, will lack the cultural competencies and social skills that will be necessary in this newly-emergent digital world.

Children whose parents do not have a computer, or cable TV or a DVD player, or cannot afford monthly internet service bills will be at a serious disadvantage and they need public access to and training in the use of such technologies. Gender plays its traditional role as well, with girls in school often marginalized in computer use, boys averaging a higher daily use and thereby gaining higher computer skills.

#### **FINDING**

15. Governments and education authorities need to provide greater guidance to parents on the educational value of television and digital media and seek ways to increase equality of access to the technology.

## References

- ABS (2006), *Patterns of Internet access in Australia*, 8146.0.55.001
- ACMA (2007), *'Media and Communications in Australian Families'*, Sydney. [www.acma.gov.au/medialiteracy](http://www.acma.gov.au/medialiteracy)
- ACTF (1989), *Lift-Off: Early Childhood Program – Philosophy and Objectives*, Australian Children's Television Foundation, Melbourne
- American Academy of Pediatrics (2001), 'Children, adolescents and television. Committee on Public Education, *Pediatrics*, Vol. 107, No. 2, pp. 423-426
- Barr, P. Muentener & A. Garcia, 2007, 'Age-related changes in deferred imitation from television by 6- to 18-month-olds', *Developmental Science*, Vol. 10, Issue 6, pp. 910-921.
- Berk, L. & A. Winsler, 1995, *Scaffolding children's learning: Vygotsky and early childhood education*, National Association for the Education of Young Children, Washington DC
- Bond University for the Interactive Entertainment Association of Australia (October, 2008).
- Buckingham, D. (2000), *The Making of Citizens: Young People, News and Politics*, Routledge, London
- Buckingham, D., 2007, *The Media Literacy of Children and Young People, A review of the research literature on behalf of Ofcom*, Centre for the Study of Children Youth and Media Institute of Education, University of London
- M. Buijzen & C. Mens, 2007, 'Adult mediation of television advertising effects: A comparison of factual, evaluative and combined strategies', *Journal of Children & Media*, 1, pp. 177-191
- Bushman, B.J. & L.R. Heusman (2001), 'Effects of televised violence on aggression'. In D.G. Singer & J.L. Singer (eds.), *Handbook of Children and the Media*, Sage, Thousand Oaks, pp. 223-254
- Calvert, S.L., B.L. Strong & L. Gallagher (2005), 'Control as an engagement feature for young children's attention to and learning of computer content', *American Behavioral Scientist*, 48 (5), pp. 578-589
- Cassell, J. (2004), 'Towards a model of technology and literacy development: Story listening systems', *Journal of Applied Developmental Psychology*, 25 (1), pp. 75-105
- Chera, P. & C. Wood, 2003, 'Animated multimedia 'talking books' can promote phonological awareness in children beginning to read', *Learning and Instruction*, 13, pp. 33-52
- Children Now (2007), *The Effects of Interactive Media on Preschoolers' Learning, A Review of the Research and Recommendations for the Future*, ChildrenNOW.org
- Clements, D.H. (1994), 'The uniqueness of the computer as a learning tool: Insights from research and practice', in J.L Wright & D.D. Shade (eds) *Young Children: Active Learners in a Technological Age*, National Association for the Education of Young Children, Washington DC
- Dens, N., P. de Pelsmacker & L. Eagle (2007), 'Parental attitudes towards advertising to children and restrictive mediation of children's television viewing in Belgium', Vol 8, no. 1, pp. 7-18
- Edgar, Don (2001), *The Patchwork Nation: Re-thinking government, Re-building community*, Harper Collins, Sydney
- Edgar, Patricia (1977), *Children and Screen Violence*, University of Queensland Press, St. Lucia
- Edgar, Patricia (2006), *Bloodbath, a memoir of Australian television*, Melbourne University Press
- Edgar, D. & P. (2008), *The New Child: in search of smarter grown-ups*, Wilkinson Publishing, Melbourne
- M. Evans Schmidt, 2006, 'Two-year-olds object retrieval based on television: testing a perceptual account', *Media Psychology*, Vol. 9, No. 2, pp. 389-409



- Fisch, S.M. (2004), *Children's Learning from Educational Television: Sesame Street and Beyond*, Erlbaum, Mahwah, NJ
- Foster, K., G. Erickson et al (1994), 'Computer-administered instruction in phonological awareness: Evaluation of the DaisyQuest program', *The Journal of Research & Development in Education*, 27 (2)
- Frei, P., V. Su, B. Mikhak & H. Ishii (2000), 'curlybot: Designing a new class of computational toys', in T. Turner et al, (eds.) *Proceedings of the ACM CHI 2000 Human Factors in Computing Systems Conference*, The Hague, Netherlands, pp. 129-136
- Gardner, Howard (1983), *Frames of Mind: Theories of Multiple Intelligence*, Basic Books, New York
- Gardner, Howard (2006), *Five Minds for the Future*, Harvard Business School Press, Boston, MA
- Hannon, C., P. Bradwell & C. Tims (2008), *Video Republic*, Demos, London
- Haugland, S.W. & J.L. Wright (1997), *Young Children and Technology: A World of Discovery*, Allyn & Bacon, Boston
- Jenkins, H. (2007), 'Confronting the challenge of participatory culture: Media education for the 21<sup>st</sup> Century', [www.projectnml.org](http://www.projectnml.org)
- 'Kids360: new children, new screens, new ideas', *Screenhub*, 2/10/08.
- Labbo, L.D. & M.R. Kuhn (2000), 'Weaving chains of affect and cognition: A young child's understanding of CD-ROM talking books', *Journal of Literacy Research*, 32 (2), pp. 187-210
- Lewin, C. (2000), 'Exploring the effects of talking books software in UK primary classrooms', *Journal of Research in Reading*, 23 (2), pp. 149-157
- Luckin, R., D. Connolly, L. Plowman & S. Airey (2003), 'With a little help from my friends: Children's interactions with toy technology', *Journal of Computer Assisted Learning*, 19 (2), pp. 165-176
- McIntyre, Paul (2008), 'Boom in virtual playgrounds for children', *The Sydney Morning Herald*, October 9.
- MediaSmart, [www.mediasmart.org.uk/about.php](http://www.mediasmart.org.uk/about.php)
- Mitchell, Harold (2008), 'ABC digital takes lead out of the barrier.' *The Australian*, 6 October.
- Montgomery, K.C., 2007, *Generation Digital, Politics, Commerce and Childhood in the Age of the internet*, MIT Press, Cambridge, Mass.
- Muir, K. (2004), *Connecting communities with CTLs: From the digital divide to social inclusion*, The Smith Family, Sydney
- Novak, Jeannie and Luis Levy (2008), *Play the Game, The Parent's Guide to Video Games*, Thompson Course Technology, <http://www.courseptr.com>
- Ofcom (UK) (2008), *Media Literacy Education Resources*, [www.ofcom.org.uk/advice/media\\_literacy/mediaLiteracyEducationResourc/](http://www.ofcom.org.uk/advice/media_literacy/mediaLiteracyEducationResourc/)
- Penman, Robyn and Sue Turnbull (2007), *Media Literacy – Concepts, research & Regulatory Issues*, ACMA, Sydney
- Power, Emily, 2008, 'Hey teacher, like, smarten up', *Herald Sun*, 16 November 2008).
- Prensky, Mark (2006), *Don't bother me mom, I'm learning*, Paragon House, St. Paul, Minnesota
- Ryokai, K., C. Vauselle & J. Cassell (2003), 'Virtual peers as partners in storytelling and literacy learning', *Journal of Computer Assisted Learning*, 19 (2), pp. 195-208
- Siraj-Blatchford, J. & I. Siraj-Blatchford (2001), 'IBM Childrenmart Early Learning Programme – UK Evaluation Report, Phase 1, 200-2001', London, IBM
- SPAA (2008), *Screenhub*, 12 November. [www.screenhub.com.au/](http://www.screenhub.com.au/)

Stanley, Fiona, Sue Richardson & Margot Prior (2005), *Children of the Lucky Country*, Pan Macmillan, Sydney

Van Scoter, J., D. Ellis & J. Railsback (2001), 'Technology in early childhood education: finding the balance.', Northwest Regional Educational Laboratory, Portland OR, <http://www.netc.org/earlyconnections/byrequest.pdf>

Wartella, Ellen, J. Lee & A. Caplovitz (2002), 'Children and interactive media: Research compendium update', The Markle Foundation, New York

Wartella, Ellen & N. Jennings (2000) 'Children and computers: New technology – Old Concerns', *The Future of Children, Children and Computer Technology*, 10, No. 2, p. 31, quoted in K.C. Montgomery, 2007, *Generation Digital, Politics, Commerce and Childhood in the Age of the internet*, MIT Press, Cambridge, Mass., p. 4)

Wartella, E., B. O'Keefe & R. Scantlin, (2002), *Children and interactive media: Research compendium update*, The Markle Foundation, NY

Weber, D. & D.G. Singer (2004), 'The media habits of infants and toddlers. Findings from a parent survey', *Zero to Three*, Vol. 25, No. 1, pp. 30-36

Zimmerman, F.J. (2007), 'The jury is still out on this!', *Television 20/2007/E*

Zimmerman, F.J., D. Christakis, & A. Metcalf (2007), 'Television and DVD/video viewing in children younger than 2 years', *Archives of Pediatrics and Adolescent Medicine*, Vol. 161, No. 5, pp. 473-479