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**“This is a different calculator – with computer games on”: reflecting on children’s symbolic play in the digital age**

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**Summary**

This chapter explores data from the first phase of doctoral research into children’s imaginative (symbolic) play, from a cultural-historical, social semiotic perspective (Vygotsky, 1978; Kress, 1997) as they explore, make and communicate personal meanings.

It begins by focusing on children’s play and ‘sign-making’, introducing the research background and highlighting the value of such play for children’s learning. Several case studies explore children’s interest in popular culture, new media and technologies through their representations or ‘signs’, evident in their ‘super-hero’ play and in their models and drawings. The chapter raises questions about early childhood cultures and practices, emphasizing the importance of reflective teaching to help understand and support children’s play and cultural interests at a deep level.

Data was drawn from observations of three-four-year old children in a nursery. These are analysed using Van Oers’s *functions of the imagination* (2005), and leading to an additional *function*, focusing on children as central players ‘operating’ their technologies. Drawing on research into ‘digital childhoods’, for example, Marsh (2005) and multi-modality (Kress 1997),

further supports analysis of these play episodes revealing young children's considerable understanding of such cultural influences.

The findings provide pedagogical points that teachers and practitioners may wish to use for critical reflection in their support of imaginative play and children's interest in popular culture and digital technologies.

**Initial questions regarding the key messages of the text:**

1. What can we learn about children's interest and understandings of new media, popular culture and contemporary technologies from observations about young children's imaginative play?
2. Why are children's own meanings so important? What is the value of such play?
3. Which pedagogical strategies can enhance and support young children's meaning-making?

**Specific points:**

- Play is valuable in many ways and provides rich contexts for young children's learning. According to Vygotsky (1978) it is within pretend or imaginative play that children use a range of representational means and artefacts to make and communicate personal meanings. This semiotic (i.e. meaning-making) perspective has been developed in recent years by Kress (1997) who refers to young children's 'multi-modality' as the many ways and diverse media and materials they use to make meanings. Both researchers recognise the significance of children's symbolic play for literacy, and more recently it is understood to also underpin mathematics (Van Oers, 2005) and *children's mathematical graphics* (Worthington, 2007, 2010).
- The socio-cultural contexts of children's homes have a considerable influence on their understanding of the world and are evident in the technologies available in homes and many other aspects of their worlds. Modern media is beamed directly into all our lives to an extent previously unknown and cultural icons from magazines, video games and television have social currency among even the youngest children (Luke, 1999; Marsh,

et al. 2005). These influences impact on children's play, drawings and model making (e.g. Kress, 1997 and 2003; Pahl, 1999; Singer and Singer, 2005).

- Play is not always well understood with the result that children's experiences may sometimes be limiting (Adams et al., 2004). Children need to know that their imaginative play and interests are understood and valued by adults in their nursery or school. This doctoral research - of which this chapter explores part, reveals that when teachers and practitioners reflect on their values, beliefs and practices and develop their pedagogy, children's play and meaning-making can be particularly rich and complex.

### **Introduction**

In his book, *How we Think*, Dewey (1933) wrote of the significance of 'reflective teaching' defining it as '*Active, persistent, and careful consideration of any belief or supposed form of knowledge in the light of the grounds that support it and the further conclusions to which it tends* constitutes reflective thought' (1933: 9, italics in the original). When considering children's play, reflection can help teachers consider issues of the (sometimes different) cultural values and expectations of the children's homes and their educational settings, values which are bound 'to influence and be influenced by the perspectives of parents, children and teachers' (Pollard and Tann, 2005: 27).

The role of reflective teaching has been explored by early childhood researchers (e.g. Heaslip, 1994; Adams, 2007) and in two large studies, SPEEL (Moyles, 2002) and SPRINT (Moyles et al, 2003): this chapter aims to promote critical, reflective pedagogy in support of effective imaginative play.

### **Play**

Among researchers the importance of play is well recognised (e.g. Huizinga, 1950; Moyles, 2005; Pellegrini and Smith, 2005; Athey, 2007), highlighting its value for cognitive processes and skills and affective behaviours (Wood and Atfield, 2005; Goswami, 2008). Vygotsky (1978) showed that through children's meaning-making with gesture and actions, artefacts, speech and drawing; imaginative (symbolic) play underpins symbolic languages such as writing. Representing meanings with open-ended materials is an

integral aspect of this 'multi-modal' meaning-making (Kress, 1997; Pahl, 1999; Worthington, 2007).

Following many years in which play in England has often been marginalised, there appears to be renewed interest in play in early years settings. The curriculum for the 'Early Years Foundation Stage' (DfES, 2007) supports and promotes play for children from birth to 5 years. Teachers and practitioners are encouraged to continue to provide play opportunities for children in Year 1 (5 and 6 year-olds) (QCA, 2002), and the final report of the 'Cambridge Review' also underlines its significance (Alexander, 2009). Heaslip addressed ways of 'making play work in the classroom' arguing 'Professionals need to be able to justify though their practices, how play is the supreme way through which young children learn, and then, just as importantly, be able to articulate this to others' (1994: 101/102).

However, in spite of curricula guidance, teachers and practitioners - particularly in schools - must justify their pedagogy in the light of tests, 'standards' and inspections, making it particularly important that teachers develop a good understanding of play and can justify its role. Since play is complex and difficult to define, observations of play can be difficult for teachers and practitioners to understand; with the result that children's experiences of play may be brief, fleeting and unfulfilling. And without adult-child dialogue to scaffold their meaning-making in play, children's own meanings often fail to develop.

### **Imagination in play: making meanings, making signs**

Semiotics (i.e. 'sign-making' or meaning-making) explores the relationship between meanings, signs, and socio-cultural influences (e.g. Vygotsky, 1978; Jewitt and Kress, 2003; Kress and Van Leeuwen, 2005), reflected in the growing research on 'multi-modality' in early childhood (e.g. Kress, 1997). Children's communicative sign-making practices are powerful psychological tools that allow them to signify meanings, to 'mean something': they support a complex interplay of thought that is rooted in children's imaginative play (Vygotsky, 1978; Van Oers, 2005). In his study on the 'potentials of imagination' Van Oers argues that 'The need to make sense of one's environment is probably one of the most basic drives' of humans' (2005: 5).

For Vygotsky 'play' is imaginative or pretend play within which children make connections between 'first order' and 'second-order' symbolism (Vygotsky, 1978), representing (re-presenting) externally their internal, mental representations. Vygotsky's research (1978) showed how through gesture, actions, sound and speech; artefacts and drawings ('first-order symbolisation') children make and communicate meanings. Whilst for example, a child uses a shell to signify an ice cream; or draws circles to signify a car (i.e. the wheels) they are only *symbols* or representations of real things (see Worthington, 2010).

In contrast, 'second-order' symbolism refers to symbolic 'written' languages such as writing and mathematical notation. The processes of assigning meanings in play and in writing are closely related and, from this perspective Vygotsky argued 'make-believe play, drawing and writing can be viewed as different moments in an essentially unified process' (1978: 116). Gunther Kress (1997) has a similar semiotic perspective, emphasising:

Imagination is a form of sign-making in which the boundaries to sign-making, the chains of signs, are potentially unlimited ... It is dependent on and enhanced by the ability to engage in free movement among forms of (internal) representation – not confined, for instance, to staying within language, or the visual, or the tactile, but able to range freely across modes (p.108).

Providing open-ended opportunities and resources offer children 'different potential' for realizing imagination (Kress 1997: 29).

### **Children of the digital age**

Marsh et al. define the digital technologies and related aspects explored in this chapter:

- *Popular culture* 'refers to those cultural texts, artifacts and practices which are attractive to large numbers of children and which are often mass produced on a global scale'... such as 'toys; games; media; and artifacts related to popular narratives, characters and icons'

- *Media* 'is a term used for materials and resources in a range of formats and modes which are used for communication' including 'books, comics and magazines, newspapers, television programmes and films'
- *New technologies* 'refer to technological innovations that have been made possible through digitisation. It can include 'old' technologies, such as radio and television, which have been transformed by the digital signal' in addition to computers, console games, hand-held computers and mobile phones' (2005: 9/10).

Characters from popular culture influence children's imaginative play (Paley, 1984), and the examples of models and play in this chapter are populated by characters such as 'Power Rangers' and 'Batman', American Wrestlers; monsters and 'CBeebies'.

New technologies explored by the children include calculators; video and computer games; and palm-held games such as 'Nintendo'; televisions and remote controls. And, in significant leaps of imagination, the children also created their own *imaginary* technologies: such 'productions are a mix of different ideas and influences that they put together to form objects which are entirely new' (Pahl 1999: 24). They made 'switches' to 'control' Power Rangers that could alternatively kill and control daylight and darkness. One child made a 'spy gadget' with codes and a protected password; another drew a 'world' that can be controlled (to rotate) and another, a 'magic watch'.

Marsh (2005: 1) writes of 'children of the digital age', showing how rapidly childhood cultures are changing and proposing that research into these aspects 'is of central importance in the provision of educational, social and cultural experiences that are appropriate for children in contemporary societies' (2005: 12/13).

Parker argues that reflective teaching can change teachers' roles from being a 'lone operator', to engaging in not only reflection, but in action-research and critical thinking. (1997: 3/4). Critical reflection is particularly relevant if we are to consider both the challenges of the 21<sup>st</sup> century and the particular contexts of individual early childhood settings and local needs, of teachers', children and families.

## **Research methodology and analysis**

The chapter draws on some of the data collected for the first phase of doctoral research, which is an extension of research into *children's mathematical graphics* (Carruthers and Worthington 2005; 2006) which charts the emergence of *children's mathematical graphics* from its genesis in imaginative play. The focus of this chapter is on children's play and representations relating to popular culture media and technologies.

The data is drawn from 16 children of three-four-years of age, of whom 12 are boys and four are girls. Their models, cut-outs and drawings were gathered through observations of children's self-initiated play in one of two nursery settings which collaborated in the research and include two short observations from the reception classes to which two children moved. The data is qualitative, drawing on the children's spontaneous play without adult direction.

### **Analysing imagination**

I used Van Oers *functions of imagination* in order to analyse and better understand the observations, adding a new function *imagination as dynamic change* that supports children's understanding and meaning-making of popular culture, new technologies, media, and sometimes magic.

In his research, Van Oers endeavoured to understand 'the novelties in children's [play] activities or verbal narratives', discovering that the 'products of imagination served special functions' (2005: 8): he developed two 'functions of the imagination', *imagination as etcetera-act* (abstract thinking) and *imagination as an act of generating alternatives* (divergent thinking).

### ***Imagination as etcetera-act***

This function of imaginative play refers 'to the invisible, by suggesting – with the help of some symbolic means – that a given series or rule can be continued' (Van Oers, 2005: 8).

During the first phase of research (Worthington 2010) I identified several examples of *imagination as etcetera-act*. For example, Hamzah drew a series of brown and black dots, explaining it was a 'car'. Whilst his drawing lacked recognisable 'car' features such as the body of a car or windows, Hamzah's verbal explanation allows us to continue the 'car'

rule for ourselves. Kress includes a similar example from a 3-year old child's drawing of a car (1997: 11).

On another occasion Finley removed a portion of a paper plate and folding the remaining portion in half, made a series of short cuts across the fold. Finally he added several short lines and marks, explaining that he'd made a puppet of 'a man'. The children had been looking at models of skeletons and talked about the ribs: the short cuts and lines on Finley's puppet appeared to suggest ribs. Rather than the children's play, drawings or models providing complete symbolic representations that are immediately accessible to adults, this example shows that it was knowledge of the context and Finley's explanation that provided the *etcetera* information. Van Oers (2005) proposes that we have to continue the 'rule' for our selves in order to understand their meanings. The important point to recognise is that, rather than attempting to replicate or make an exact copy of something, young children's models and drawings effectively capture their internal, mental representations which can become clear when we take the time to listen and understand.

### ***Imagination as an act of generating alternatives***

This *function of imagination* 'consists of making alternative representations of objects, situations, and actions... of how the world *could* be' (Van Oers, 2005: 9). Identifying Vygotsky's example of a child substituting a stick for a horse (1978), Van Oers emphasises that the object (or other representation) chosen by the child depends on its affordances, (i.e. the possibilities or qualities that a gesture, action artefact, material or mark offers) and the extent to which the child's choice is compatible with their intended meaning.

Examples of this function of imagination from my data included a child engaged with her friend in playing 'moving house'. Putting lots of books in a bag (pretending this was a 'suitcase of clothes'), Felicity dragged the heavy bag to their 'new house'. In another instance, Nathan used an envelope and some coloured paper to make 'an astronaut' and announcing 'Blast off' lifted it above his head to make it 'fly to the moon'. The lack of visual details was completed by his actions and words, and sufficient to ensure that others understood his meaning.

### ***Imagination as an act of dynamic change***

As I analysed examples I became aware that some observations did not fit neatly in either of the two categories above. They showed children assigning specific powers or functions to their artefacts, models and drawings, using them to 'operate' imaginary 'technological gadgets'. This led to an additional 'function' that I created, *imagination as an act of dynamic change*. Vygotsky refers to the 'association between imagination and reality' which 'may represent something substantially new' and include 'any technical device, machine or instrument' (2004: 20). In certain respects this new category appears to be related to Vygotsky's fourth 'law governing the operation of the imagination', that:

a construct of fantasy may represent something substantially new, never encountered before in human experience and without correspondence to any object that actually exists in reality' which 'once it has been externally embodied, that is, has been given material form, this crystallized imagination that has become an object begins to actually exist in the real world, to affect other things (2004: 20).

Vygotsky's examples include 'any technical device, machine, or instrument... created by the combinatory imagination of human beings' (Vygotsky, 2004: 20/21); they follow 'an internal logic of their own' (2004: 24). Pahl emphasizes that such play, involves 'complex stories of transformation' (1999: 90) and that artefacts and models 'added realism to dramatic play' and 'enabled the wearers to feel 'more real' in the roles they were adopting' (1999: 48).

### **'Switches for Power Rangers'**

A group of boys was engaged in 'super-hero' play about 'Power Rangers', excitedly running outdoors, swinging from the tree and climbing on and through a tunnel. Marsh et al. comment how important such 'media icons are to young children'; 'Parents often described their children as being 'obsessed with them and were aware of the pervasiveness of their consumer culture' (2005: 45). Noticing some red bricks Mason put one in the end of his sleeve so that it was partly hidden; then added several bricks, and some to his other sleeve.

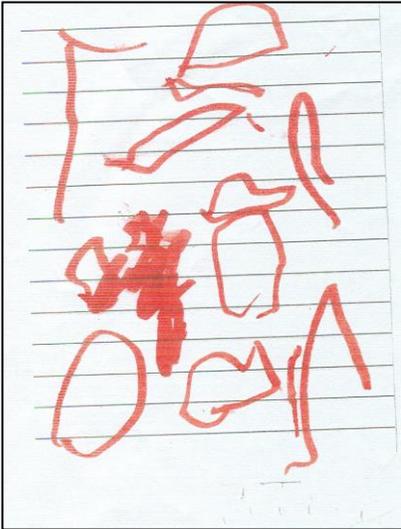


**Photograph 13.1** Mason's 'switches for Power Rangers'.

Ignoring the colour of the bricks in his sleeves Mason urged his teacher "Press that one and I turn red; that one – green and this one – blue! I'll leave them on until I see monsters!", then pressing one of the bricks he shouted "Kill!" After a short interval with two friends in the hammock, Mason climbed out and pressing one of the bricks announced, "It's morning so I have to turn the lighting speed up!" Next he added another brick to his sleeve and admiring the effect said "This looks like a *real* Power Ranger one" before running off.

### **'Paper calculators'**

Alfie watched Mason use pages from a notebook to make 'calculators' and decided to join in. Having drawn shapes on his page, Alfie ripped it off the pad and then made more symbols, saying '6, 7, 8, 9, I've done a number 10', followed by a third sheet, announcing '9, 10, 11, 12': in twenty minutes Alfie made a total of seven paper 'calculators'.



**Figure 13.2** One of Alfie’s paper ‘calculators’

This play began several weeks earlier when Mason was playing with a real calculator: he seemed to be using it as a digital game, pressing the buttons and commenting excitedly “Fighting games! Video games!” It was Mason who first decided to use a small notebook to make ‘paper calculators’, explaining as he tore off a sheet, “This is a *different* calculator with computer games on”.

Several of Mason’s peers joined in and developed their own ‘paper calculators’, and making another calculator, Alfie announced “Lots of fighting!” A week later Mason explained he’d made a calculator with ‘Batman’ on it. Pahl emphasizes ‘Children’s modelling needs to be carefully watched. It is often different from what we suppose’ (Pahl 1999: 17). The boys returned again and again to this play over a period of two terms, making rapid scribble-marks, drawing ‘buttons’ on their ‘calculators’ and occasionally writing numerals. This interest allowed the children to adapt, co-construct and negotiate symbolic meanings so that layers of meanings evolved over time.

### **‘Televisions for boys’**

Several boys had been talking about their favourite American wrestlers on television. Mason decided he was going to make ‘a TV for wrestling’ and Keon joined him, adding ‘I’m doing a TV for boys – not for girls!’ Alfie drew the outline of a television screen, a ‘TV for boys *and* girls’, adding knobs so it could be turned on and off. It seems likely that

Mason had not known televisions with controls on the set at home, but perhaps their representation emphasized the physical potential of being able to control his 'television'.

Sophie joined in this play explaining that her TV was for 'CBeebies' (a television channel currently broadcast for young children): she drew a figure on her 'screen', suggesting that she understood 'CBeebies' as more appropriate for girls - or at least not specifically aimed at boys.



**Figure 13.3** Television control knobs



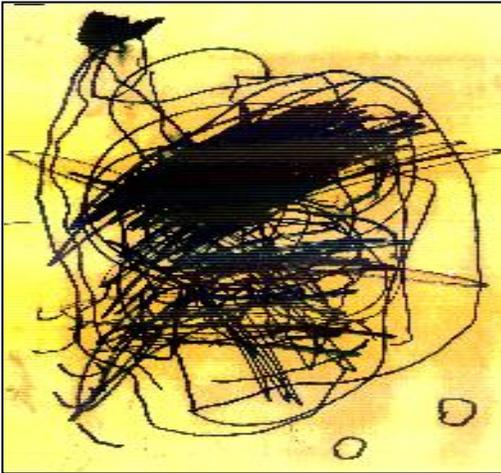
**Figure 13.4** Mason's remote control

Mason announced he needed a 'clicker' (a remote control) and poking a pencil into a 'multilink' cube pointed it at his 'television', pretending to turn it on and off. Developing Mason's earlier idea, Alfie moved his hand up and down the wall where the children had stuck their 'televisions', pretending to press the (sometimes imaginary) knobs, then extending Mason's idea of a remote control, he mimed the actions of using one. Extending this play further, Mason later made a (paper) wrestler's belt with a large buckle for his friend Keon.

Whilst paper might seem an unlikely material to represent calculators or television, in both contexts it suited the expression of children's ideas. Kress argues that 'this conceptual 'what is to hand' is significant, because it sets limits to and provides possibilities for imagination, opens up categories... and cultural differences of various kinds.' Additionally 'It provides materials for the differentiation of gender' (Kress, 1997: 31)

### **Social and individual play**

The examples of *imagination as an act of dynamic change* were often highly social and may in part reflect children's home experiences of similar technologies where they sometimes watch or play with other family members or friends. However, it is worth acknowledging that some of today's technologies such as CD players with headsets, mobile phones and computer use emphasise individual rather than shared interaction: these experiences appear to be reflected in other examples of drawing and models gathered from this data. For example, Lewis described his drawing (figure 13.2.) as 'the world – and it goes round!' He explained that his home was in the top left-hand corner and near that, the nursery. Lewis pointed to a winding route between nursery and his home, suggesting a map of the route he had physically moved through many times, and explained that the black circles (lower right) 'make it go'.



**Figure 13.5** 'To make the world go round'

On other occasions Nathan made a 'magic watch' (a strip of paper with a zigzagging line on it) that enabled magic to be channelled through his fingers to object or person at which he pointed, and Mason made a 'spy gadget' (figure 6) for which he created a code (a string of combined letters and numerals) to 'protect the password' to access his gadget; reversing the code enabled him to turn his gadget off.



**Figure 13.6:** Mason's 'spy gadget'

### **Gender issues**

Like the examples in this chapter, in Pahl's research it was largely boys who engaged such play, 'Boys are often less confident with pen and paper than girls... Model making is

a way of expressing ideas in space and extending their thoughts... expressing concepts in the third dimension' as 3D models (1999: 94).

In their large scale research project into 'digital beginnings' Marsh et al. observed that 'boys in particular appeared to respond to the increased use of popular culture, media and new technologies... a pattern which has been noted in other studies' (Marsh *et al.* 2005: 71). In the examples in this chapter, power and control appeared to be a significant factor for boys. Kress proposes that '... children are not interested in just everything, but are selective in their interests from an early age ... These selections lead to specialisms ... One effect of such specialization is the establishment of gender ... Some selections seem to be quite gender-neutral... others are not' (Kress 1997: 120).

### **Cultural differences: pedagogy**

The examples included in this paper are drawn from the city nursery, with the exception of Mason's spy gadget and Nathan's watch, (from their first few weeks in Reception). The research aims to be collaborative, the researcher and teachers co-constructing understanding together. Whilst the two nursery settings studied used the same play-based curriculum, adults' understood and interpreted play and their pedagogical roles differently, and engaged in different levels of critical and reflective discussion during the research.

In the city nursery the teachers focused considerably on the children's own meanings, sensitively listening, closely observing and 'tuning into' the children's symbolic actions, play behaviours and representations. The teachers' attention to detail was reflected in their written observations which informed their subsequent plans to further support the children's thinking. This interest and attention impacted on the children's play, evidenced by numerous rich examples of their meaning-making that often revealed complex, meanings and 'signs' that they elaborated and transformed.

Staff in the rural nursery encouraged and valued 'free play' that the children clearly enjoyed and the data included several examples of children exploring and representing personal meanings within role play. There was considerable evidence of children making models with plastic construction materials such as 'Lego', but, since such resources limit

what can be done with them, their models generally had only one meaning. In this nursery children made almost no representations that they transformed or adapted. Perhaps because there was no culture of making models with various media and junk materials, no examples of *imagination as an act of dynamic change* were found from this setting.

The children had extended periods to play freely indoors and during these times adults were often busy with individual children, engaged on an 'assessment task'. Adults in this setting seldom engaged in discussion with the children about their play or representations: 'meaning-making' was not explicitly discussed and written observations were brief and seldom used to inform planning. An extended period of free play outside was clearly enjoyed by the children but at this time adults supervised, watching and ensuring safety rather than observing and engaging in children's play.

## Findings

The play episodes explored in this chapter show that:

- the children spontaneously initiated their own play, making independent decisions about the 'modes' and materials that would enable them to best signify and communicate their meanings;
- the children's imaginative play was considerably influenced by their knowledge and understandings of technologies, popular culture and new media, crossing the boundaries between home and their setting;
- the data showed considerable gender bias with almost all examples of *imagination as an act of dynamic change* from boys' play;
- the setting's culture and pedagogical practices influenced the children's meaning-making; the extent to which they made junk models and whether they explored popular culture and digital technologies.

### **'What do I, the writer, feel about the contribution of this chapter to supporting critical reflection?'**

These examples highlight the importance of rich imaginative, symbolic play in which meanings combine with culture to shape children's narratives, supported by adults

observing and tuning into ‘children’s ‘voices’. It is hoped that the examples (and analysis) of the play episodes will encourage teachers and practitioners to look closely and critically examine imaginative play in their own settings, reflecting on their roles in supporting this.

This chapter offers new insights into the influence of children’s ‘digital childhoods’ on child-initiated play. Pahl proposes that ‘Nursery teachers need to be sensitive to the stories and meanings that children bring to the nursery’ (1999: 50) and Dyson (1993) argues that it is crucial to value the children’s social worlds (see Pahl, 1999: 84).

The research has also highlighted the gender bias in this play. However we should not assume that girls have no knowledge or interest in contemporary technologies and popular culture, indeed ‘both boys and girls respond to these themes’, provided adults are aware and make appropriate provision (Marsh *et al.* 2005: 62). Significantly the findings have also shown how differing perspectives, values and levels of critical reflection contribute to contrasting outcomes for children’s play.

### **Implications for pedagogy: ‘What might YOU, the reader, reflect on now?’**

In our global, digital age the fast-paced change of life suggests that it is even more important to consider and re-evaluate our values, beliefs and practices in early education, to go beyond ‘routine action’ and engage in ‘*reflective* action’ involving ‘a willingness to engage in constant self-appraisal and development’ and implying ‘flexibility, rigorous analysis and social awareness’ (Dewey, cited in Pollard and Tann, 1993: 9). Marsh *et al.*’s 2005 study found that their involvement effected practitioners earlier ‘mixed views about the role and importance of popular culture and media in children’s lives’ (2005: 48), impacting on their attitudes and approaches to ‘open everybody’s eyes’ and (2005: 71).

Early childhood practitioners have the means to engage in reflection and critical discussion to support children’s imaginative play and ‘digital childhoods’, suggesting this should also be a responsibility we take seriously.

### **Through discussion with your colleagues, reflect on the extent to which you:**

- focus on children’s meaning-making throughout their imaginative, symbolic play and

- engage in dialogue with children to scaffold their meanings, enabling them to negotiate and co-construct understandings.
- Critically examine the extent to which children's explorations of popular culture, new media and technologies are noticed and valued
- Consider gender bias in the children's play and the extent to which your provision supports the interests of both boys and girls regarding their 'digital cultures'
- Reflect on your provision of open-ended resources for junk-model making and drawing materials and, and of space children have to explore these materials. What more might you add or change?
- Meet with colleagues to share and discuss your observations of children's play so that you can co-construct your understanding deepen insights into children's imaginations.

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