

This article was downloaded by: [University of Sussex Library]

On: 12 March 2013, At: 06:07

Publisher: Routledge

Informa Ltd Registered in England and Wales Registered Number: 1072954 Registered office: Mortimer House, 37-41 Mortimer Street, London W1T 3JH, UK



## Early Child Development and Care

Publication details, including instructions for authors and subscription information:

<http://www.tandfonline.com/loi/gecd20>

### Playful and creative ICT pedagogical framing: a nursery school case study

Guy Roberts-Holmes<sup>a</sup>

<sup>a</sup> Early Years and Primary Education Department, Institute of Education, University of London, London, UK

Version of record first published: 12 Mar 2013.

To cite this article: Guy Roberts-Holmes (2013): Playful and creative ICT pedagogical framing: a nursery school case study, *Early Child Development and Care*, DOI:10.1080/03004430.2013.772991

To link to this article: <http://dx.doi.org/10.1080/03004430.2013.772991>

PLEASE SCROLL DOWN FOR ARTICLE

Full terms and conditions of use: <http://www.tandfonline.com/page/terms-and-conditions>

This article may be used for research, teaching, and private study purposes. Any substantial or systematic reproduction, redistribution, reselling, loan, sub-licensing, systematic supply, or distribution in any form to anyone is expressly forbidden.

The publisher does not give any warranty express or implied or make any representation that the contents will be complete or accurate or up to date. The accuracy of any instructions, formulae, and drug doses should be independently verified with primary sources. The publisher shall not be liable for any loss, actions, claims, proceedings, demand, or costs or damages whatsoever or howsoever caused arising directly or indirectly in connection with or arising out of the use of this material.

## Playful and creative ICT pedagogical framing: a nursery school case study

Guy Roberts-Holmes\*

*Early Years and Primary Education Department, Institute of Education, University of London, London, UK*

*(Received 9 November 2012; final version received 31 January 2013)*

This article reports on the findings of a one-year qualitative study in which a nursery school used information and communication technology (ICT) and a digital media consultant as a catalyst for cultural change leading to teachers' improved pedagogical framing and children's enhanced learning dispositions. The pedagogic framing included the children making mini-movies and avatars which were uploaded onto the nursery website. It is argued that such innovative and creative ICT pedagogy was strongly motivational and afforded opportunities for co-construction and sustained shared thinking (SST) as it engaged with children's and families' digital cultural habitus. The research reports on field notes, interviews and observations ( $n = 15$ ) of child peer interactions and teacher child interactions.

**Keywords:** pedagogy; ICT; children's talk; digital habitus; sustained shared thinking

### ICT in young children's learning lives

Since the publication of *The Digital Beginnings Report* (Marsh et al., 2005) and *The Bryon Review – Children and New Technology* (Byron, 2008), it has been acknowledged that young children are both immersed in and competent users of digital technologies in their homes. Recent data notes that four- and five-year olds regularly use internet-based technologies for more than two hours per day (Edwards, Skouteris, Rutherford, & Cutter-Mackenzie, 2012). The ubiquitous use of digital technologies in young children's home life has been positively welcomed by some as affording increased opportunities for complex cultural, social and literacy practices (Marsh, 2010). However, a risk-averse culture of fear has led others to deride and question the use of information and communication technology (ICT) in young children's lives along with an associated rise in childhood obesity and sedentary lifestyles (House, 2011).

Essentialised terms such as 'cyberkids' and 'digital natives' are used to describe a young generation who have grown up with digital technology, and young 'digital natives' are juxtaposed with the 'digital immigrant' status of an older generation which includes teachers. Building on this populist notion of a generational digital divide, Zevenbergen (2007) noted that early childhood settings need to embrace young children's use of new technologies if settings are to build upon young children's innate 'digital immigrant' habitus. Selwyn (2009), however, whilst encouraging ICT use in schools, strongly cautions against exaggerated popular claims of young

---

\*Email: g.roberts-holmes@ioe.ac.uk

people's 'digital native' expertise. Nevertheless, Yelland, Lee, O'Rourke, and Harrison (2008) maintain that digital multi-modal forms of expression and communication offer a significant change in our culture and therefore challenges to educators. Early childhood educators need to engage with 'critical digital literacies' if they are to be child centred and culturally meaningful for young children (Buckingham, 2007; Marsh, 2010). There is a need to further theorise the relationship between early childhood education and society's accelerating technological changes (Waller, 2011).

Marsh et al. (2005) noted the positive effects on children's motivation and engagement with learning when settings incorporated new technologies because such technologies resonate with the children's digital home experiences where ICT tends to be increasingly culturally embedded and familiar to the children and can provide young children with a source of success and satisfaction (Marsh, 2010; Plowman, McPake, & Stephen, 2009). A disparity has been noted between children's cultural identities at home where ICT is increasingly important with the context in some pre-schools where children can tend to have unsatisfactory ICT learning experiences (Marsh, 2010).

Several commentators have noted the potential of ICT to facilitate dialogue and collaboration and hence enable young children's positive learning dispositions (Aubrey & Dahl, 2008; O'Hara, 2008; Stephen & Plowman, 2008). O'Hara (2008, p. 37) noted instances in which ICT enhanced a wide range of learning dispositions including problem-solving skills, high levels of motivation, concentration, resilience and perseverance. Stephen & Plowman (2008) identified three main categories of young children's learning with ICT: first, developing learning dispositions; second, extending knowledge of the world; and finally acquiring operational skills. Of these three categories, their study demonstrated that the development of positive learning dispositions was the most significant of the early learning that occurred.

### **ICT and pedagogy**

Plowman and Stephen (2005), Stephen (2010), and Stephen & Plowman (2008), have noted the teachers' reluctance in the early years to articulate their pedagogical understandings within the context of ICT. This, they argue, was not surprising, given that for many of the teachers within their study, a Piagetian focus on providing a richly resourced environment was understood as a sufficient condition for learning to occur. Vygotskian cultural-historical theory provides an opportunity for early childhood teachers to assert their professional expertise as pedagogical experts, rather than simply as passive providers of an environment in which they observe children moving through developmental milestones (Fleer, 2010). Cultural-historical theory understands mental ability as developing through social relations in a group so that individual and collective developments are interdependent. One of the most important recent conceptual developments within early childhood education has been that of sustained shared thinking (SST) (Siraj-Blatchford, 2007) within play-based educational programmes. SST has shifted the pedagogical imperative from the environment and onto the teachers' skilful and sensitive intervention to extend children's learning within a play-based context. SST demands that the teacher pedagogically frames new conceptual learning beyond the child's everyday understanding and practices as well as extending the child's current conceptual understanding. This highly skilled pedagogical practice enables the teacher to both understand where the child is currently located, in terms of conceptual understanding and contextual appropriateness, and be aware of how the teacher can scaffold the child's further learning. Such dialogic

teaching involves explicit pedagogical framing and can therefore be seen as a challenge to some early childhood teachers (Alexander, 2006).

Plowman and Stephen (2005) identified three kinds of adult ICT pedagogical involvement: reactive supervision, guided interaction and a hybrid approach. Reactive supervision was the most common form of teacher interaction and in their study tended to be limited in focusing upon children's turn-taking. Such intervention cannot be termed as a pedagogic strategy since there was no learning planned for the encounter. In contrast to reactive supervision, 'guided interaction' involved the teacher purposefully teaching ICT content knowledge and skills. In order for practitioners to engage in such 'guided interaction', they need to have the ICT confidence and competence that would enable interaction and 'inter-thinking' between the children (Mercer et al., 2010). They also need to be able to articulate why such pedagogical framing and intervention is needed in order to extend children's learning. However, Plowman and Stephen (2005) note such explicit ICT pedagogy was 'rare' and was noticeable by its absence. A hybrid approach involved a basic instruction with the ICT where necessary to avoid, for example, breakage, but thereafter there was no further pedagogical input since it was understood that responsibility for learning was primarily located within the child. Given the very limited pedagogical input observed by Plowman and Stephen (2005), they warn that such a *laissez-faire* approach is in danger of placing any learning, progress and change onto the young child and does not necessarily lead to sustained and purposeful learning. Others too have noted such a hegemonic early childhood philosophy where the role of the teacher is reduced to that of a non-directive facilitator (Fleer, 2010; Siraj-Blatchford, 2009).

## Methods

The research design was an in-depth qualitative case study of the ways in which the nursery school used ICT to support children's learning. Of particular interest was the children's use of the computer for learning and the extent to which computers facilitated sociable learning and associated positive learning dispositions. The objectives of the research were as follows:

- (1) to identify the ways the nursery school supported children's learning through the use of ICT;
- (2) to analyse the quality of the dialogic interactions between the children whilst playing together on the computer; and
- (3) to examine the teachers' ICT pedagogical practices.

The research was introduced by both the headteacher and the researcher at a staff meeting where the teachers had the opportunity to raise questions and to discuss the project together. The headteacher reported that the staff meeting and discussion had raised colleague's awareness and understandings of the various ways that ICT had supported children's learning and he had subsequently distributed literature to staff on the benefits of ICT and learning.

### *Case study site and participants*

The selection of the case study nursery school was driven by purposive sampling, in particular the researcher's perception of the need for an early-years setting where

creative ICT initiatives were in place and Docksider's unique long-term employment of a digital media consultant fulfilled this criteria. The headteacher explained that he used ICT as a 'tool' to initiate cultural change and engage with the wider school community and this had led to the employment of a digital media consultant to work throughout the school particularly to make 'mini-movies' with the children. The headteacher noted how when he took over leadership of the school four years ago there was a complacent and inward-looking culture that needed changing. The headteacher demonstrated contextual literacy (Spillane, 2006) of the school and its external environment, a key aspect of good leadership (Siraj-Blatchford & Manni, 2007). In an innovative and creative manner the headteacher drew the staff together by working with a professional digital media company to make a collaborative whole school video of early years' literacy teaching. Making the video had the effect of improving communication and dialogue between different staff members who had previously been working in comparative isolation. Whilst celebrating the staff's success, the making of the video also explicitly challenged pedagogy giving cause for reflection. Subsequently, the school's website was considerably developed and the literacy video was placed onto it.

The selection of the nursery school also benefited from a long-term partnership with the Institute of Education. Docksider Nursery School had 150 children, and its long tradition for excellence drew children from across a large city in South West England in which it was located. The nursery school was located in a large industrial estate in the centre of the city and the school garden was surrounded by a high security fence. The school had four classes with a qualified nursery teacher and nursery nurse in each class. The children's population was mixed both socio-economically and ethnically with both white British heritage children and children from a range of Asian, African and other European heritages. The nursery school had 20% of children receiving free school meals (FSM) compared to a national average of 13.7% for nursery-aged children.

Written informed consent for the research was gained from the headteacher, the teaching staff and from the parents. Voluntary informed consent was gained from the children and the children were verbally informed of the research and their right to withdraw at any time. The observations were carried out within normal classroom activities and there were no instances in which the children seemed anxious.

### ***Data collection and analysis***

Sixteen visits were made to the nursery school between January 2011 and July 2012 and the researcher spent between half a day and a whole day with the teachers and the children on each visit. Seven days of unstructured observations of the classes and their activities around ICT (both indoors and outdoors in the nursery garden), and in particular children playing on the computer together, were recorded as field notes for each visit. Alongside these observational field notes, unstructured scoping interviews with the headteacher and the digital media consultant were made. Subsequently, each of the four classroom teachers was interviewed twice and each nursery nurse was interviewed once. The interviews lasted between 10 and 25 minutes long and were digitally recorded and subsequently transcribed. Due to the hectic schedule of the teachers in working days, the interviews took place in the teachers' classrooms before school whilst the teachers were organising their classrooms and after school when the children had gone home.

The first interview with the teachers was organised with a semi-structured interview schedule which included generalised scoping questions concerned with what the

teachers thought the children learnt when playing on the computer. The second interview with the teachers used a focused semi-structured schedule with specific questions on a guided observation of children playing together on the computer. The guided observation schedule was based upon Mercer et al.'s (2010) typology of talk which comprised three educationally significant types of talk – disputational talk, cumulative talk and exploratory talk – and described as ‘social modes of thinking’. Disputational talk is characterised by disagreement and individual decision making in which there is a tendency for short exchanges consisting of assertions and challenges. Within cumulative talk, speakers build positively but uncritically on what the other children have said, and it is characterised by repetitions, confirmations and elaborations. Exploratory talk is understood as where partners engage critically but constructively with each other's ideas so that knowledge is made more publicly accountable and reasoning is more visible in their talk. These three descriptors are not meant to be neat and hermetically sealed categories but rather a useful frame of reference for how children think together. The characteristics of the three kinds of talk were placed in a grid and the teachers circled which type of talk was most prevalent. Using the observation schedule guided by Mercer's typology for talk, the researcher made eight observations of children playing on the computer and the teachers made seven observations. The researcher was able to make one joint observation with each of the four class teachers and to discuss the interpretations of the observation, thus providing a level of inter-rater reliability. The observations lasted between 5 and 30 minutes.

The data consisted of nine sets of field notes, two focus group staff meetings, eight semi-structured teacher interviews and four nursery nurse interviews; four semi-structured interviews with the headteacher and the digital media consultant; eight researcher-guided observations and seven teacher-guided observations. The field notes, the different stake holder interviews and the observations facilitated triangulation across the different data sets. All field notes were typed and all audio recordings transcribed. These were analysed within a thematic coding approach in which the researcher coded and analysed the data to identify themes and concepts. The interviews and field notes were scrutinised and were reduced to meaningful segments and given a code name. A process of constant comparison between the segments and codes led to the generation of themes (Creswell, 2012). The major themes which emerged from the coding of the data were the nursery school's embracing of the children's digital cultural identities; the positive learning dispositions facilitated by ICT and the prevalence amongst staff of a digital native discourse.

## Findings

### *Embracing the children's digital cultural identities*

Even though mobile phones were banned in the nursery because of Child Protection issues, families and children entering the nursery were observed to have been using smart phones and tablets to text and talk as they dropped off their children. On three occasions a four-year old boy was observed coming into the nursery with headphones watching video on a smart phone. Rather than seeing such technological cultural identities as a threat to a romanticised interpretation of a ‘golden age’ of childhood without technology, the nursery Headteacher had responded positively,

Some of the parents and adults around the children have iphones and ipads and the children want to copy that. Even though they are banned in school, the parents come in on

their phones and sometimes the children too! It's become so much part of the adult world that the children want to get into it themselves and we want to mimic that in school if at all possible. (Dockside Headteacher)

Hence the nursery school had bought touch screen PC computers which had the same touch screen technological features as the families' smart phones. This is significant because computers in the early years were generally not child friendly, and studies have shown that children find traditional mouse clicking onto icons difficult to manipulate (O'Hara, 2008).

The digital media consultant (from now on referred to as the consultant) used the video cameras and the touch screen PCs to make 'video shorts' or 'mini-movies' with the children which were subsequently placed onto the nursery website. In the mini-movies the children re-told and role-played both well-known and imaginative stories. The consultant edited the mini-movies, gave them a title, added the children's names and background music and then uploaded them onto the classroom computers. By double-touching the picture icon of the mini-movie on the computer screen, the children were able to watch their mini-movies as many times as they liked. There was considerable enjoyment amongst the children as they watched their mini-movies and engaged in a process of collaborative multimodal dialogue (Wolfe & Flewitt, 2010).

The consultant had trained a class teacher to make and edit mini-movies using an avatar of the class bear, known as 'Ted', who went home with the children. Using a digital camera, the children took photos of Ted in their homes with their families. The children then returned Ted and the photos to nursery. The class teacher had learnt to make a talking animated digital avatar of Ted responding to the children's photos and Ted's 'experiences'. A Ted icon was placed on the computer desktop for the children to access the films. The class teacher noted that

The consultant has been brilliant in showing me how to make the Ted avatar. I could never have done it without her expertise. The bear talks about their home and family and their experiences. For example Aysha has a new baby at home and Ted is here talking about the baby. This recognises something really important in Aysha's life and gives her a lot of self-esteem by bringing the home and school together. (Class Teacher 4)

Through employing a consultant to develop the teachers' ICT confidence and abilities, Dockside Nursery School had enabled this class teacher to successfully engage with a sophisticated avatar package. Making and using the avatar mini-movies with the children's photographs had encouraged dialogue amongst the children and their families. The school's creative and innovative use of technology had enabled an ICT 'habitus' to develop which resonated with families' home-based interests and knowledge of ICT (Marsh, 2010).

### ***ICT facilitating positive learning dispositions***

Teachers maintained that the mini-movies were strongly motivational and developed the children's positive learning dispositions.

This video business gives the children huge amounts of confidence. They love watching this stuff together and they say 'ah there you are now!' and 'look, there's Carla!' and so on. They excitedly talk about it amongst themselves as they watch. Seeing themselves role-playing a story on screen really gives them confidence – seeing a really positive image of themselves so it raises their self-esteem. On the computers they get a chance

to share it with their friends so it is good for social skills. The mums can also see the videos in the reception hall and they are over the moon about it! (Teaching Assistant)

Staff reported that such experiences with ICT had motivated and engaged children both emotionally and cognitively. They stated that children's positive learning dispositions such as perseverance, self-regulation and self-esteem were encouraged by watching themselves in the mini-movies with their friends. The children took delight in seeing themselves and each other on the screen and excitedly talked amongst themselves about what each other was doing in the video. They re-watched the mini-movies many times together and enjoyed predicting what was coming up. The parents had the opportunity to watch the children's videos in the nursery entrance foyer where there was a large plasma screen. At nursery drop off and pick up times the parents congregated around the screen and watched the children's mini-movies with evident pride and enjoyment. In the following teacher interview it is clear that ICT had had a positive effect on some children's learning dispositions.

ICT has been a huge success and played a key role in engaging some children in education because they can have positive experiences, success and control with it. For example Darren's self-esteem is growing and he's really interested in ICT and it's motivating him . . . . It is a way in to oracy and literacy for him and he is really persevering with it. (Class Teacher 2)

Darren's teacher reported that he had had language delay difficulties and socialising problems when he arrived at school and that his motivation and self-belief had considerably developed since using the computer. Darren's positive learning dispositions such as motivation, perseverance and success had been developed through using the computer. As a consequence, his teacher noted an increase in positive participation in sociable and cooperative activities.

### *The prevalence of a digital native discourse*

There was a belief amongst the staff that the children's knowledge of ICT was intuitive, stemming from a hegemonic popular discursive construction of young children as being natural 'digital native' experts.

They learn it all at home and bring it in here . . . . It's just amazing what he can do. He's way beyond what I can do and he's constantly showing me things I don't know were there. (Class Teacher 2)

A four-year old came in here and uploaded music to the computer. I couldn't do that. (Class Teacher 3)

There you see, she's three years old and an expert already – how do they do it? (Nursery Nurse 3)

The above quotes demonstrate both a lack of confidence with ICT on the part of some staff members whilst privileging and emphasising children's perceived lack of fear and innate digital abilities. The consultant was aware of some practitioners' lack of ICT confidence and through a process of informal staff development provided advice and encouragement to the staff which in turn supported more active pedagogical interventions.

Sara has helped to give us confidence to play with the ICT and not be apprehensive about ICT 'cos some of us at the beginning were worried about breaking the cameras ... Our confidence has been passed onto the children so now they are happy to use without fear. (Class Teacher 4)

Sara is an inspiration and this is impacting upon the children's motivation. We couldn't have done it without her invaluable skills. (Class Teacher 1)

I've learnt how to upload video from the cameras and make an icon on the children's desktop. Sara is now teaching me how to edit video. (Teaching Assistant 4)

The consultant had enabled the staff to professionally develop their ICT abilities which in turn had had a positive impact upon teachers' creative pedagogical techniques and had challenged the teachers' self-perception of being 'digital immigrants'. This had enabled them to move forward with technologically and culturally meaningful video projects with the children.

### *An analysis of children's computer interactions and talk*

Twelve out of fifteen observations noted that the children's talk tended to be located within the disputational and cumulative categories. However, during the observation, periods were noted when children cooperated and collaborated. Such positive collaboration on the computer included the prevalence of non-verbal cooperation and learning and has been termed as sustained shared attention (SSA) (Wild, 2011). SSA attention included mutual attention and focus on the computer tasks, tuning in and showing genuine interest rather than the more intersubjective process of SST (Wild, 2011, p. 227). The following extract demonstrates both cumulative and exploratory talk as well as SSA between two 4-year-old girls, Shira and Lucy.

Shira, after getting Lucy's agreement, clicked on the cBeebies icon for the Snowball Game. The objective was to get a large snowball to move up the screen along a series of ice ramps over drops and into a cave. In order to be successful both girls had to work together with the mouse and the keyboard. To begin with Shira took the mouse and Lucy used the keyboard and touched the screen. At the end of each level, the girls swapped over their roles and thereby alternated turn taking on the mouse and the keyboard. Throughout the extract the girls asked each other questions, listened to advice and took one another's perspectives into account in attempting to successfully complete the game. Through a process of cumulative and exploratory talk the girls successfully extended each other's thinking to complete the game. Throughout the observation, the girl's active participation and enjoyment of the game and of each other's responses was noted.

Transcript: *Example of cumulative/exploratory talk. Shira and Lucy cBeebies Snowball Game*

Shira: Let's do Snowball?

Lucy: Yeah.

Shira: Wait waitwait ... more ... push harder!

Lucy: What?

Shira: Look like this ...

*(Shira gets up and pushes the ball along on the screen with her finger).*

Lucy: Oh yeah OK. Should go in now.

*Two minutes of SSA.*

Shira: Let's go in here. It goes to the cave.  
 Lucy: Why does that go to the cave?  
 Shira: 'Cos it does we need to.  
 Lucy: It's high – it's coming down ...  
 Shira & Lucy: Noooo ....

*Laughing together as the snowball crashed to the bottom of the screen. A new level comes up on the screen. They swap the mouse and the keyboard over.*

Lucy: This side, this side .... go up here.  
 Shira: Where?  
 Lucy (*pointing to screen*): Here 'cos it's faster, see.  
 Shira: Are you sure? ..... Oh yeah – it's faster up this side.

*Three minutes of SSA.*

Lucy (*very excitedly*): Yeah .... Hold it .... Now go down that way down (*pointing*).  
 Shira: That way down Yeah yeah (*laughing*).  
 Lucy: Yeah like that.  
 Shira: Yeah, yeah good.  
 Lucy: Down ..... Jump jump!  
 Shira: No .... Go back.  
 Lucy: Eh? Why?  
 Shira (*pointing at screen*): 'Cos it's in there.  
 Lucy: Oh yeah, yeah.  
 Shira: Again again ..... Wait.  
 Lucy: Wait .... now in there.  
 Shira & Lucy (*laughing*): Oh yeah ... did it!

The above extract demonstrated shared commitment and intent of purpose between the two girls. Alternating their control over the mouse, the keyboard and the screen demonstrated their collaborative team work. However, the dialogue between the girls remained largely within the cumulative category in which Lucy confirmed Shira's decisions. On three occasions Lucy asked Shira questions, but these were more for clarification than challenging questions which would have required Shira's explanation. This may in part be due to the closed nature of computer game which did not encourage exploratory talk but rather basic directive language between the girls to steer the snowballs.

***Improved pedagogical framing***

The staff demonstrated intersubjective awareness of the children's contextual and conceptual understanding of digital video (Fleer, 2010) and extended the children's understanding by introducing the creative and cognitively demanding storyboarding film-making process itself, thereby scaffolding the children well beyond what they could currently manage on their own. This demanded that the teacher made a 'double move' (Fleer, 2010), holding onto both the children's current understandings whilst at the same time introducing new conceptual knowledge. Such scaffolding required the skilful pedagogical framework of storyboarding the mini-movie filming and editing the story with the children. Figure 1 (after Fleer, 2010) illustrates this as 'a double move' in the relationship between the children's and teachers' conceptual and contextual intersubjectivity and the teachers' pedagogical framing of the new conceptual knowledge.

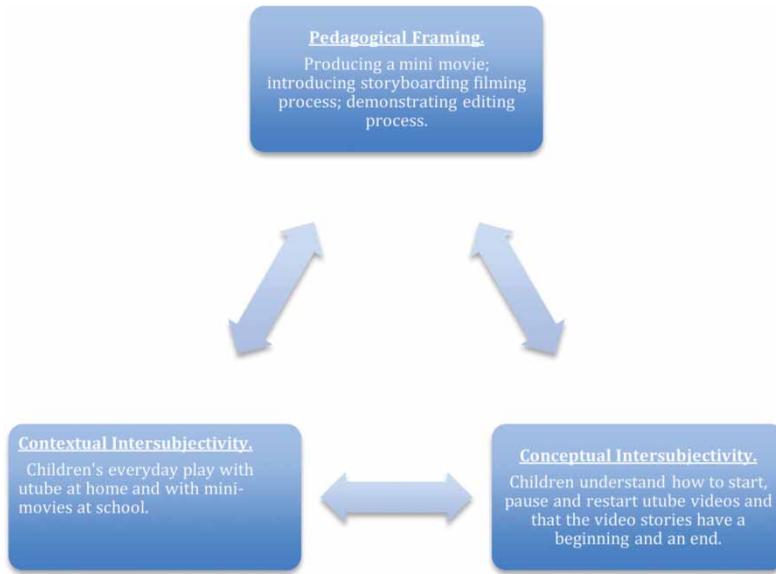


Figure 1. A 'double move' in the relationship between the children's and teachers' conceptual and contextual intersubjectivity and the teachers' pedagogical framing of the new conceptual knowledge (after Fleer, 2010).

The following transcript is an extract of the pedagogically framed storyboarding dialogue between the teacher and the four-year-old Henry, Leo and Lucy. The dialogue demonstrated SST and exploratory talk between the teacher and the children.

*Transcript of Class 4 teacher with Henry, Lucy and Leo.*

Teacher: What sort of things do we need in a space movie?

Henry: Well I'm gonna be a satellite.

Teacher: What would the satellite have to say?

Henry: Beep beep beep.

Teacher: And what does the satellite do?

Henry (*spinning around*): The satellite spins around like this and gets into different planets and meets a space man.

Leo: The space man goes *arrrrrggggghhhhhhh*cos, the space man's nasty and chases the satellite home.

Henry: That's what happens to satellites.

Teacher: Why can't it be a friendly space man?

Leo: 'Cos the spaceman likes to make this noise ... *agrrrrhhhhh*.

Teacher: How does the satellite get up into space?

Henry: They can make rockets and the space shuttle and fly the satellites up to space.

Teacher: How does the satellite move around in space?

Leo: The space man can push it around 'cos he's really strong.

Teacher: What does the space man eat to make him so strong?

Leo: Lots of cooked meat (*fetches some from home corner*) like this.

Teacher: Where does the space man get meat from in space?

Leo: He has his special bag around his neck.

Teacher: So what happens to the satellite?

Henry: The satellite bumps around in the dark and helps things.

Teacher: Helps who?

Henry: Space men that are lost!

Teacher: What will you be Lucy?  
 Lucy: Ummm, a star?  
 Henry: What noise does a star make? Is it humming?  
 Lucy: Yes, a sort of twinkling humming.

Story boarding the space story was an open-ended task in which the children were strongly motivated to ‘work together’ to produce a sustained shared narrative in which the teacher modelled open-ended questions. The dialogue fulfilled the criteria for a sustained shared conversation because both parties were involved and the learning content was instructive (Siraj-Blatchford, 2007). The teacher’s four open-ended questions challenged and extended Henry’s and Leo’s talk which is unusual because Siraj-Blatchford and Manni (2008) found that only a small percentage (5.5%) of early childhood educators’ questions were open ended. It may be that the participatory and co-constructive dialogue in which ideas that had gone before were built upon as well as asking questions of each other facilitated the teacher’s open-ended questioning.

Throughout the exchange there was a sense of the children’s views being respected and of a shared purpose. The dialogic story boarding session lasted for 30 minutes after which time the children collected props and then filmed the story in which the satellite got pushed into the shed by the space man and was rescued by the star. Subsequently, the consultant demonstrated the editing process of the mini-movie with the children and uploaded it onto the school website so that the children could enjoy the movie both at home with their families and in school.

In a similar manner, in the following example the Class 3 teacher observed the children pretending to be bees in the garden chasing each other around. The class teacher wanted to extend and build upon the children’s contextual interest and motivation and move them beyond their everyday conceptual knowledge and so used a mosaic of the children’s buzzing bee digital pictures as a challenging pedagogical frame. In this case, the teacher’s double move involved working with the children’s interest and knowledge of bees, whilst introducing photography with the digital cameras to extend the children’s thinking as in the following. The teacher’s creative pedagogical framing enabled her to ask open-ended questions to the children in order to prompt their thinking to avoid having a finger across the camera lens. Through a process of dialogic teaching and ‘working together’, the teacher directed the children to question and resolve the mark across the photo.

*Teacher with Colin, Jane and Rose.*

Teacher: Colin, you run through the flowers like a bee looking for flowers to eat and Jane, you take a photo of Colin as he runs.

*Jane takes the photo and they all look at it together.*

Rose: That’s lovely – he’s running.  
 Teacher: But what’s that smudge on the top?  
 Colin: A cloud?  
 Teacher: Hold the camera Jane again and let’s see how you do it.  
 Teacher: Look at Jane’s finger, where is it on the camera?  
 Rose: On the front.  
 Teacher: The front of what?  
 Rose: The sticking out bit.  
 Teacher: Is that OK?  
 Rose: Well, it might make the smudgy bit.

In Jane's subsequent photos of buzzing bees she carefully avoided placing a finger across the camera lens. Back in the classroom, the teacher showed the children how to upload the photos and make a mosaic of all the pictures which was beyond the children's current conceptual ability.

## Discussion

The headteacher focused the staff's attention towards a positive engagement with digital technology as a significant 'cultural tool' (Rogoff, 2003; Vygotsky, 1978) for families and young children and at the same time recognised the potential of ICT as a catalyst for cultural change throughout the school. This contextually literate leadership enabled the staff to pedagogically engage with the children's and families' digital cultural habitus, leading to motivational interest for ICT throughout the nursery school. This relationship among the headteacher's leadership, the use of ICT as a 'catalytic change agent' (Clark & Murray, 2012) and improved pedagogical engagement leading to the children's enhanced learning dispositions and thinking can be illustrated in Figure 2.

Figure 2 illustrates the relationship among innovative leadership, ICT, pedagogy and children's learning.

The richly resourced ICT environment had generated the potential for 'dialogic spaces' (Wegerif, 2007). However, the observational research using Mercer's linguistic typology suggested that the enabling environment provided by Dockside was insufficient on its own to extend children's learning. The observations of children playing computer games noted evidence of peer scaffolding but this was largely based upon SSA rather than the more cognitively challenging SST. Several reasons were identified for this. The computer programmes tended to be too narrowly focused and closed with simple objectives that did not encourage collaborative thinking and the children sometimes struggled to understand the instructions of the computer games leading them to invent their own rules. Additionally, the discursive production of children as digital natives (and therefore the teachers as digital immigrants) tended to circumscribe some teachers' pedagogical interventions which led to reactive supervision. This prevalent discourse was exacerbated by a reified belief in child-centred exploration that had the effect of negating the role of the teacher.

Dockside Nursery School's unique employment of a digital media consultant had increased practitioners' confidence leading to improved pedagogic framing using

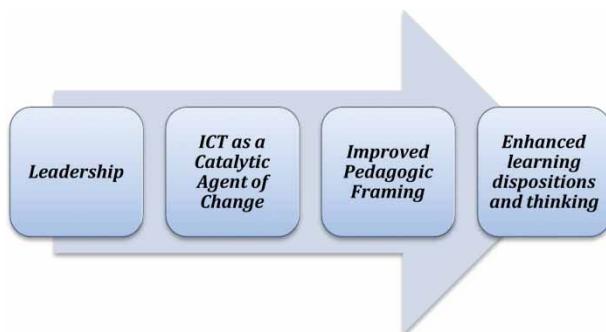


Figure 2. The relationship among innovative leadership, ICT, pedagogy and children's learning.

creative and innovative ICT projects such as making mini-movies. Children's abilities to make mini-movies were dependent upon the teachers' expertise and their sensitive and insightful pedagogical framing. Co-construction of the mini-movies and SST in the making of the mini-movies occurred because the children were strongly motivated and the teachers felt increasingly comfortable with their ICT technical competence (some staff engaged in further professional development and attended ICT classes within the local technology cluster). Genuine learning and co-construction of knowledge occurred between children and teachers as they played and experimented with making mini-movies together. The pedagogy was time consuming and resource intensive since it demanded teachers working with small groups of children for prolonged periods facilitated by a digital media consultant. Such resourcing led to the teachers' improved pedagogical framing and the children's enhanced learning dispositions as they engaged together with challenging ICT projects.

### Acknowledgements

I am very grateful to Mr Simon Holmes, the headteacher of St Philip's Marsh Nursery School, whose passionate leadership and belief in young children's ICT creative abilities, initiated and sustained this project throughout its duration. Thanks also to Sara Strickland, Suited and Booted's digital consultant and her child centred digital expertise. The children and staff of St Philip's Marsh Nursery School gave generously of their time and enthusiasm for which I am very grateful. Thanks also to my colleague Professor Dominic Wyse who provided invaluable critical comments on an earlier draft.

### Notes on contributor

Guy Roberts-Holmes is the programme leader of the MA Early Years Education at the Institute of Education, University of London. His current research interests include curriculum and pedagogy within ICT and children's cross cultural identities.

### References

- Alexander, R. J. (2006). *Towards dialogic teaching*. Cambridge: Cambridge University Press/Dialogos.
- Aubrey, C., & Dahl, S. (2008). *A review of the evidence on the use of ICT in the early years foundation stage*. Retrieved September 30, 2012, from [http://www.elearningcentre.co.uk/.../review\\_early\\_years\\_foundation](http://www.elearningcentre.co.uk/.../review_early_years_foundation)
- Buckingham, D. (2007). *Beyond technology: Children's learning in the age of digital media*. Cambridge: Polity Press.
- Byron, T. (2008). *Safer children in a digital world: The report of the Byron review*. Retrieved July 21, 2012, from <http://media.education.gov.uk/assets/files/pdf/s/safer>
- Clark, R., & Murray, J. (2012). *Reconceptualising leadership in the early years*. Maidenhead: Open University Press.
- Creswell, J. (2012). *Qualitative inquiry and research design: Choosing among five approaches*. London: Sage.
- Edwards, S., Skouteris, H., Rutherford, L., & Cutter-Mackenzie, A. (2012). 'It's all about Ben10<sup>TM</sup>': Children's play, health and sustainability decisions in the early years. *Early Child Development and Care*, 183(2), 280–293.
- Fleer, M. (2010). *Early learning and development: Cultural-historical concepts in play*. Cambridge: Cambridge University Press.
- House, R. (2011). *Too much, too soon?: Early learning and the erosion of childhood*. Stroud: Hawthorn Press.
- Marsh, J. (2010). *Childhood, creativity and culture: A literature review*, Sheffield University. Retrieved July 30, 2012, from <http://www.creativitycultureeducation.org/research-impact/literature-reviews/>

- Marsh, J., Brooks, G., Hughes, J., Ritchie, L., Roberts, S., & Wright, K. (2005). *Digital beginnings: Young children's use of popular culture, media and new technologies*, University of Sheffield. Retrieved July 30, 2012, from <http://www.digitalbeginnings.shef.ac.uk/final-report.htm>
- Mercer, N., Warwick, P., Kershner, R., & Staarman, J. (2010). Can the interactive whiteboard help to provide 'dialogic space' for children's collaborative activity? *Language and Education*, 24(5), 367–384.
- O'Hara, M. (2008). Young children, learning and ICT: A case study in the UK maintained sector. *Technology, Pedagogy and Education*, 17(1), 29–40.
- Plowman, L., McPake, J., & Stephen, C. (2009). *Growing up with technology: Young children learning in a digital world*. London: Taylor and Francis (Routledge).
- Plowman, L., & Stephen, C. (2005). Children, play, and computers in pre-school education. *British Journal of Educational Technology*, 36(2), 145–157.
- Rogoff, B. (2003). *The cultural nature of human development*. Oxford: Oxford University Press.
- Selwyn, N. (2009). The digital native – myth and reality. *Aslib Proceedings: New Information Perspectives*, 61(4), 364–379.
- Siraj-Blatchford, I. (2007). Creativity, communication and collaboration: The identification of pedagogic progression in sustained shared thinking. *Asia Pacific Journal of Research in Early Childhood Education*, 1(2), 3–23.
- Siraj-Blatchford, I. (2009). Quality teaching in the early years. In A. Anning, J. Cullen, & M. Fleer (Eds.), *Early childhood education. Society and culture* (pp. 137–48). London: Sage.
- Siraj-Blatchford, I., & Manni, L. (2007). *Effective leadership in the early years sector (ELEYS) study: Research report*. London: Institute of Education, University of London/General Teaching Council for England.
- Siraj-Blatchford, I., & Manni, L. (2008). Would you like to tidy up now? An analysis of adult questioning in the English foundation stage. *Early Years: An International Journal of Research and Development*, 28(1), 5–22.
- Spillane, J. P. (2006). *Distributed leadership*. San Francisco, CA: Jossey-Bass.
- Stephen, C. (2010). Pedagogy: The silent partner in early years learning. *Early Years: An International Journal of Research and Development*, 30(1), 15–28.
- Stephen, C., & Plowman, L. (2008). Enhancing learning with information and communication technologies in pre-school. *Early Child Development and Care*, 178(6), 637–654.
- Vygotsky, L. (1978). *Mind in society*. Cambridge, MA: Harvard University Press.
- Waller, T. (2011). Digital play in the classroom: A twenty-first century pedagogy? In S. Rogers (Ed.), *Rethinking play and pedagogy in early childhood education. Concepts, contexts and cultures* (pp. 139–145). London: Routledge.
- Wegerif, R. (2007). *Dialogic education and technology: Expanding the space of learning*. New York: Springer.
- Wild, M. (2011). Thinking together: Exploring aspects of shared thinking between young children during a computer-based literacy task. *International Journal of Early Years Education*, 19(4), 219–231.
- Wolfe, S., & Flewitt, R. (2010). New technologies, new multimodal literacy practices and young children's metacognitive development. *Cambridge Journal of Education*, 40(4), 387–399.
- Yelland, N., Lee, L., O'Rourke, M., & Harrison, C. (2008). *Rethinking learning in early childhood education*. Maidenhead: Open University Press.
- Zevenbergen, R. (2007). Digital natives come to preschool: Implications for early childhood practice. *Contemporary Issues in Early Childhood*, 8(1), 19–29.