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Knowledge, learning processes, and ICT in early childhood education

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An enduring problem for educators and educational researchers in recent years has been related to the difficulties of discriminating between curriculum and pedagogy in early childhood education. At no point has the debate been more acute than in relation to the issue of the inclusion of phonic approaches to reading in the UK Guidance for the Foundation stage of learning. In this paper we present data collected in research into the use of ICT in early childhood, and argue that a consistent application of the philosophical concept of emergence, which many early childhood academics have paid lip service to for some time, offers a means of resolving these controversies.

We draw upon data collected in Effective Provision of Pre-School Education (EPEE) qualitative case studies (Siraj-Blatchford et al. 2002) to demonstrate some of the challenges of implementing a phonics curriculum. A study of emergent literacy work carried out in a UK preschool is also presented to show the value of applying information and communications technology (ICT) in early childhood education (Parmar, 2011). We argue that the major problems that are considered with phonics are related to the pedagogies that are typically applied. The assumptions that are apparently made by policy makers that the universal adoption of phonics instruction may be sufficient to ensure that all children learn to read at an early age are also considered unhelpful. It is suggested that the curriculum content of phonics are less problematic and controversial than commonly supposed, and a case is made for the inclusion of playful phonics in an emergent literacy curriculum, where ICT may be seen to provide significant pedagogic knowledge support to the educator.

Introduction

An enduring problem for early childhood educators and educational researchers in recent years has been related to the difficulties of defining curriculum and pedagogy. Curriculum questions throughout education are always at root, questions of knowledge and of the 'canon'. In secondary or high school contexts these debates concern the selection of appropriate literature for education. In English language contexts the questions addressed are whether the canon

should be based upon those traditionally valued such as Shakespeare, Chaucer, Dickens, Dostoevsky, Eliot, Wolf or Shelly, or should it be made up of modern and/or majority world authors. Arguably, in the second decade of the 21st Century we have come a long way from early year's educators assuming that there is a universal canon of knowledge to be taught, and that their task is of the 'banking' kind that was criticised by Paulo Freire in the 1960s. That is where teachers make 'deposits' of knowledge in their pupils. While the knowledge explosion has made any possibility of agreeing upon such a selection of predefined pre-school of knowledge a daunting prospect in itself, the development of improved access to knowledge through ICT has also reduced the need for rote learning at all levels of schooling. The progressive development of a consensus among early childhood educators regarding the central importance of play has also tended to marginalise concerns regarding the curriculum and this has been significantly strengthened in recent years by postmodern critique. It is to this critique that we now turn.

Curriculum, Knowledge and Postmodernity

Curriculum controversies are often concerned with questions regarding 'whose' knowledge is to be prioritised, and such considerations inevitably bring us to question the aims of education as a whole. From a conservative perspective these are typically related to the perceived economic requirement to improve the labour market and from a radically different perspective parents and educators often consider the child's freedom of individual self-expression to be the primary concern. The views of most readers are likely to be somewhere between these two extremes and it is beyond the scope of this paper to make a case for any particular point along that continuum. Some effort will be made however to clarify the issues. While concerns regarding the curriculum have always been considered to be related to knowledge, given the heavy emphasis upon play in early childhood it isn't at all surprising to find that the postmodernist writers have focused most strongly upon a critique of the pedagogic knowledge of teachers and by implication at least, of the teacher education curriculum rather than that of the curriculum provided for children.

Of course, for the child there is always curriculum content, educators always have contextual objects or objectives; they are always concerned to deal with particular problems, ideas, concepts, attitudes or activities. Children are learning all of the time from everything in their environment, and that learning always has *content* as well as *form*, so that whenever learning takes place we can say that a 'curriculum' is involved (however implicit or hidden that it might be). Pedagogy and curriculum may therefore be considered two sides of the same coin, with every learning episode, and it may be argued every human interaction, having both. But what is 'pedagogic knowledge'? Gage (1985) argued that we should distinguish between knowledge that is general (nomothetic knowledge), and knowledge that applies to the understanding of particular events or individuals (ideographic knowledge). He argued that teachers creatively apply their nomothetic knowledge to the ideographic problems posed by the unique groups of children that they are faced with; with all of their specific needs, socio-cultural status and cognitive and affective demands. Pedagogic knowledge may therefore be considered both nomothetic and ideographic.

Dahlberg and Moss (2005) have made a significant impact on the pedagogy and curriculum debate with their critique of the processes of globalisation in early childhood education. Their argument has been that in the face of hegemonic conceptions of early childhood educational quality, the priority for early years institutions should be to develop themselves as "places of ethical and political practice: …able to confront dominant discourses that claim to transmit a true body of knowledge, and that seek to manipulate our bodies, mould our subjectivities and govern our souls" (p.2).

The dominant discourse they refer to is considered to be one in which the institution is seen as: "…first and foremost, a site for technical practice, seeking the best methods and procedures for delivering predetermined outcomes" (p.2). But the conception of post-modernism that is applied here as some kind of *refutation* of modernism and its truth seeking objectives is open to serious question. As Burbules (1995) has observed, when Lyotard (1984) defined postmodernism as an: "incredulity towards metanaratives", incredulity should not be considered any kind of denial or rejection. It is simply an "inability to believe" (Burbules, 1995 p.2). Lyotard fully recognised that however ambivalent its relation to modernism had become, postmodernism was not a refutation of modernism, rather it was a product of it:

> "…it is a mistake to think that postmodernism is about the rejection of modernist conceptions of language, science, ethics, reason, and justice. Thinking that it is would require that we ask for the arguments that would support such a rejection, and ask for an account of what one is going to replace them with….[and] as soon as one offers something that looks like counterarguments, or tries to offer criteria of a "better" alternative, he or she is promptly caught up in a contradiction, for these are precisely the types of things that are being denied" (Burbules, 1995).

As Young (2008) has argued in another context, it is important not to forget that education involves the transmission of knowledge from one generation to another. Educational sociology has come a long way from the over-deterministic Marxist critiques of education's reproduction of capitalism in the 1970s to show how the dominant power relations are resisted and at times overcome (Siraj-Blatchford, 2010) but at times it appears as if the critique is extended to the extreme of denying the legitimacy of education serving to transmit knowledge from one generation to another. Yet such a transmission must be recognised as an inevitable feature of social practice and enculturation. The curriculum 'problem' is certainly one of power, politics, and ideology, as much between generations as across them. But to deny or wish away the process is simply naïve. The solution is not to somehow 'remove' the curriculum, it has to be one of replacing it. In fact to deny the importance of curriculum in early childhood education is to ignore the social construction of all knowledge.

The promotion of 'play' in early childhood doesn't put the curriculum in the hands of the child, inevitably they are playing in the cultural contexts and within the environmental constraints provided by the adults around them, and for good or ill they 'play out' the day to day realities of all those lives they observe around them. The most serious danger of burying ones head in the sand and ignoring the curriculum, is that we may fail to recognise that it is the curriculum that children have access to in early childhood that most significantly determines

their future educational and economic success. It is the curriculum that serves most significantly to reproduce social inequality and deprivation. This was a lesson learnt in the early days of multicultural education when attempts were made in many schools to promote 'Black Studies' in the interests of improving the self-esteem of the Black, ethnic minority. These curricula tended to marginalise the children involved and distract attention from their underachievement in the mainstream curriculum. One of the most significant contributions of the UK *Effective Pre-school and Primary Education* (EPPE and EPPSE 3-16) research projects has also been to show how effective early childhood education is already in supporting many children in succeeding against the odds of social disadvantage (Siraj-Blatchford and Siraj-Blatchford, 1998, Siraj-Blatchford 2010).

As Young argues, Bourdieu was quite correct in suggesting that every culture is arbitrary and therefore all cultural transmission are a form of symbolic violence. But it doesn't necessarily follow that all cultural transmissions are logically to be struggled against, because the logical conclusion to that would be that each generation would have to reinvent knowledge: "… and therefore; like animals, be limited to survival (but with a much more limited range of instinctive capacities to draw on)" (2008, p10).

Young's argument is that teachers will always be faced with a discontinuity between the culture of a curriculum and a culture of childhood and that the discontinuity will always be greater for those disadvantaged by their social circumstances. What is important is to identify a curriculum that empowers children to overcome their disadvantages. It is also important to recognise that the knowledge that the disadvantaged are disproportionately excluded from is not just the "knowledge of the powerful, it is also: "in an important sense, knowledge itself" (p.10).

All of the foregoing arguments may be considered equally relevant in the case of the pedagogic knowledge of teachers and to the curriculum provided for children. While the popularity of 'free' play in particular has tended to hide the realities of the early childhood curriculum it is important to recognise that there are occasions when it still becomes controversial (Pearson and Degotardi, 2009). In fact at no point may this controversy have been more acute that in relation to the issue of the inclusion of phonics in the UK Guidance for the Foundation stage. Research has consistently shown a strong correlation between reading proficiency and academic success at all ages (Siraj-Blatchford and Siraj-Blatchford, 2009a), and yet national curriculum specifications for phonics in the early years have often been met with strong protests from practitioners.

The case of phonics in early childhood education

The Early Years Foundation Stage (EYFS) curriculum in the UK provides for children up to age five when they begin school[1] and it is organised around four broad principles related to: the *Unique Child, Positive Relationships, Enabling Environments*, and *Learning and Development*. It includes a total of 69 Early

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[1] In the UK children reach "compulsory school age" on the 1st January, 1st April or 1st September following their 5th birthday.

Learning Goals with 30 (43%) of these relating to specific knowledge content, although only 7 (10%) are concretely specified, the rest being of a very general nature e.g.: "Extend their vocabulary, exploring the meanings and sounds of new words" —"Begin to know about their own cultures and beliefs and those of other people." Even where the goals do define very specific knowledge content it is often clear that they would in any event be prioritised in *most* literacy or numeracy curriculum contexts e.g.:"Know(ing) that print carries meaning and, in English, is read from left to right and top to bottom"… "Use language such as 'greater', 'smaller', 'heavier' or 'lighter' to compare quantities." In fact it could be argued that it would be hard to imagine *any* (socio-pedagogic) early childhood curriculum failing to include most of the EYFS learning goals directly specifying content e.g.: "Recognise the importance of keeping healthy, and those things which contribute to this". Of the *69* EYFS *Early Learning Goals*, there have been only two that have been subject to significant sustained individual criticism:

> "2.10 **Communication, Language and Literacy** - By the end of the EYFS, children should:
>
> Use their phonic knowledge to write simple regular words and make phonetically plausible attempts at more complex words.
>
> Write their own names and other things such as labels and captions, and begin to form simple sentences, sometimes using punctuation".

The non-statutory EYFS Guidance suggests that:

> "**When children are ready** (usually by the age of five) provide systematic regular phonics sessions. These should be multisensory in order to capture their interests, sustain motivation and reinforce learning" (DfES, 2007, p.51).

For the child, the specific knowledge content of phonics is the set of specific sounds that are (most of the time) represented by the letters of the alphabet applied in English spelling. It is intended that the child should learn each of these sound-symbol correspondences and then blend them together to *read* the word. The controversies associated with this approach to reading instruction have raged for more than 20 years in the UK. Following the Rose Report (2006) and at the present time a 'synthetic' approach to phonics is strongly advocated by the government in England who are now planning to test the phonic skills of all children at age 6.

In the USA the National Reading Panel (NICHD 2000: 97) and in Australia another government report on the teaching of reading (DSET 2005: 14) concluded that phonics should not be the most dominant reading instruction and that balanced approaches to reading were the most successful. As Wyse and Styles (2007) have argued, extant research suggests the need for more balanced approaches that combine tuition in phonics: "at a variety of levels (e.g. phoneme, onset-rime) combined with meaningful experiences with print" (p. 40). The UK government initiative has almost unanimously been criticised by the early year's educational research and policy community many of whom have been working very hard to promote more emergent literacy strategies for several

years. But this contest between 'emergent' and [phonic] literacy has been argued in mostly curriculum terms. The argument has been on the relative merits of the curriculum content of emergent literacy programmes (including the use of 'real books'), and a curriculum dominated by letter-sound correspondences that are often of little meaning to the child. The critical emphasis has been upon curriculum rather than pedagogy.

But the viability of phonics clearly depends largely upon the pedagogy that is applied and the pedagogic knowledge of the educator. The non-statutory EYFS Guidance is quite clear: "*Practitioners need to make principled professional judgements as to when individual children are ready to start such work.* For most children this will be by the age of five" (p. 52). So whole class teaching approaches to phonics are unlikely to be appropriate in a foundation stage classroom. While some children may be considered ready for systematic phonics in a group of 4–5 year olds other children will not. This demands a high degree of pedagogic knowledge by early childhood educators which cannot always be assumed. Problems were identified in a study of some of the most effective early childhood settings identified in the EPPE research project (Siraj-Blatchford et al. 2002). The study found that, even in the demonstrably effective settings, practitioners often showed an inadequate knowledge and understanding of a range of curriculum areas, including the teaching of phonics[2]. In particular it was found that some teachers were unable to identify the most appropriate curriculum content for the age group. The following example illustrated some of the problems observed:

Example 1: Phonics

BOY 4, BOY 3 and BOY 5 sit at the table and BOY 4 and BOY 5 fight for a seat.
NURSERY OFFICER 1 - Today we're going to play a game where you have to find a word and the picture".
BOY 4 "I can do that, I did that this morning at home" NURSERY OFFICER 1-
"Now, we must remember to only find our own words, not anyone else's, okay".
BOY 4. "I know everything"
NURSERY OFFICER 1 "Right BOY 3, you start can you find the word tap".
10.45am He picks the word "net"
NURSERY OFFICER 1- "Is that tap?"
BOY 3 - "Yes" N.O. "Let's have a look at the word".
NURSERY OFFICER 1- "What letter does tap begin with?"
BOY 3 /t/ "good, what's this letter points to an 'n' (n in net)
BOY 3 says nothing.
NURSERY OFFICER 1- "What's wrong with that letter?" What is that letter?"
BOY 4 wants to join in.
NURSERY OFFICER 1 "Don't help BOY 4 unless he wants it".
BOY 3 - "I want BOY 4 to help"
NURSERY OFFICER 1 "Okay BOY 4 can you help BOY 3 to find the word tap".
BOY 4 finds it quickly. NURSERY OFFICER 1- "Excellent BOY 4 well done".
10.55am BOY 4 and BOY 5 both have a turn "Oh you boys are too clever for this game" (BOY 3 is struggling). NURSERY OFFICER 1 - "I'm going to spread the cards out in the middle. BOY 3 can you find the word sat". (BOY 3 reaches for

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[2] It is significant to note here that this is in England. In contexts where English is taught as a second language in the early years the phonic sounds presented to young children can only be described as idiosyncratic.

BOY 5). NURSERY OFFICER 1- "Well done BOY 3 what goes next BOY 3 /a/. NURSERY OFFICER 1- And what's the last letter (keeps repeating 'sat') BOY 3- "I need help" NURSERY OFFICER 1 - "You need help, BOY 4 can you help BOY 3 to find the last letter in sat) BOY 4 finds 't' "Well done boys". (The same game is repeated with each child. BOY 5 attempts to spell Pin. He gets /p/ and /n/ but cannot get /i/. NURSERY OFFICER 1 keeps repeating the word 'pin' and asking him what letter goes in the middle. [She does not break the word down into letter sounds.] BOY 4 says /i/. NURSERY OFFICER 1 "i well done, it's 'i' isn't it BOY 5?" After going to the other 2 she then goes back to BOY 5 to spell out his word with the letters in front of him - he struggles with this. (306 PDN obs 3)

Siraj-Blatchford et al. (2002) identify a number of pedagogic problems with this activity. The practitioner didn't model or teach the child the phonics at all. She appeared to be testing all the time, never telling the child why a letter was /t/ or T. The task was decontextualised from the children's experience, it wasn't related to their names, or words in a story. The Nursery Officer seemed to think that reading required letter identification, and didn't seem to understand that letters are not phonemes. Nor that blending the sounds in a sequence was a difficult task, and that middle vowels were the hardest of all. It also appeared that the Nursery Officer was unclear about onset/rime. She might not have been aware that a syllable can usually be divided into two parts: the onset, which consists of the initial consonant or consonant blend, and the rime which consists of the vowel and any final consonants. It wasn't at all clear if there was any particular order in which the letters were being taught and the sequence also suggests that the Nursery Officer may think that after recognising 'whole words' the children needed to learn the letters in the word.

While the need for systematic and intensive phonics teaching is currently a popular idea amongst policy makers this is often based on an assumption that reading competence is automatically achieved as soon as a number of separate component skills (including phonics) have been mastered. But many of those who advocate 'whole language' or 'emergent' approaches consider reading to be a whole, indivisible process in which a number of different cueing systems (phonics among them) are used simultaneously for making sense. As suggested above, most authorities advocate such mixed approaches in support of children's early reading.

What can we learn from emergent literacy?

'Emergent development' is a philosophical notion that dates back to the very earliest writings in 19th Century psychology, and as applied to early childhood learning and development it suggests that the cognitive structures that emerge in children are *irreducible* to their component parts. In fact from the perspective of emergent development, it is considered impossible to deduce the child's development as a whole from any observations of their previously learnt behaviour or behaviours. Both Piaget and Vygotsky applied these notions of 'emergence' (Sawyer, 2003). 'Emergent Literacy' was a term first applied in Marie Clay's doctoral dissertation (1966), and Whitehurst and Lonigan (1998) cite Sulzby, (1989), Teale and Sulzby (1986), Sulzby and Teale (1991) in defining the concept as:"…the skills, knowledge, and attitudes that are presumed to be developmental precursors to conventional forms of reading and

writing", as well as; "…the environments that support these developments." (p. 849).

In practical terms emergent literacy is all about encouraging playful 'mark making' as a natural prelude to writing, it is about *reading* a range of different kinds of text to children, and drawing their attention to the value and uses of text in the world around them. Emergent approaches to literacy encourage 'literacy play' in the nursery, setting up pretend office play environments, libraries, and story books for children to integrate into their play. Educators who promote emergent literacy also provide positive role models by showing children the value that they place in their own use of print and encourage the children to develop an emergent awareness of the nature and value of these resources for themselves.

Another thing that many educators committed to emergent literacy do is to encourage parents to read to their children and ensure that the children see them reading for their own purposes. In fact large-scale research projects looking at the development of early literacy have shown the enormous value of parents reading to children and taking them to the library (Sylva et al. 2004).

Both Vygotsky and Piaget saw play as an important symbolic capacity building process. From the perspective of Piaget (1969) or Vygotsky (2004), the sort of development that is required for a child to read should therefore be considered the result of the child's creative and constructive interaction with a progressively challenging but playful print culture and environment. For these theorists, 'reproductive' or 'empirical' learning was, by contrast, considered the result of the child reproducing or repeating recalled actions. If we take as another (perhaps easier) example; the 'conservation of mass' (the idea that a ball of plasticine has the same mass even when it is shaped into a long, thin roll), the general concept of 'conservation' is not acquired through any kind of reproductive or empirical/repetitive learning, it must be understood that it involves emergent conceptual development. When a child is unable to conserve, it is usually because they focus or 'centre' their attention on one characteristic to the exclusion of all others, and they don't mentally reverse the action. We know that the order in which children demonstrate the different forms of conservation (of liquids, of mass, etc) depends upon their familiarity with the particular context. Kessenich and Morrison (2008), for example, refer to the capability of children from a Mexican village known for its pottery-making, to learn the conservation of mass before they learn to conserve number (at school).

For both Piaget and Vygotsky we can see that it would be pointless trying to teach conservation directly, even if for Vygotsky an appropriate pedagogy might involve the teacher providing sufficient scaffolding[3] for the child to solve *new* problems requiring conservation. But Vygotsky would also argue that these very concrete intellectual capabilities are first developed by young children as they begin to understand that others have their own perspectives and views, and that a degree of reflection upon their own actions would also be valuable. The foundations for learning the sophisticated symbolic systems of literacy and numeracy are first developed in the pretend play of young children, and in their manipulation of objects symbolically, as they let them 'stand in' for each other. These object substitutions are extended in social interaction to objectify the

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[3] within their *zone of proximal development*

behaviour (and roles) of other people (or animals etc), and supports the child in learning to control their own behaviour in response to these roles.

So there are a wide range of things children must learn before they will become readers. Clearly, speaking and listening skills and vocabulary are crucial. Research tells us that one of the most significant things is actually self-regulation (McClelland et al. 2006; Blair et al. 2007; Florez, 2011) and research also suggests that this can be modelled and scaffolded through 'sustained shared thinking' with peers and adults (Sylva et al. 2004).

Studies have shown that ICT, when used responsibly, can provide significant tools to support self-regulation, social interaction, sustained shared thinking and symbol manipulation in early childhood (Siraj-Blatchford and Siraj-Blatchford, 2006). We have also found that ICT can provide significant support to educators in terms of their pedagogic knowledge. The following account of some recent use of an ICT phonics programme is provided to illustrate its value.

Playful Phonics with AlphaBlocks

The following data are drawn from an on-going study applying the use of new media in a high quality early childhood ICT environment incorporating touch screens, wireless mouse and broad band internet connections (Parmar, 2011). The children in the nursery regularly interact with the computer touch screen and there are 3-4 chairs available for 2 children to play and sufficient for 2 to watch as well. The equipment is installed in an open plan pre-school learning environment. For all the on-going trials, the researcher is actively involved with the children as an educator/facilitator. A *key worker*[4] accompanies the researcher to make observations and ensures the well-being of the children. The following transcription provides a typical 'taste' of the sort of interactions we have been observing where the children are actively engaged and immersed in on and off screen playful learning with AlphaBlocks.

AlphaBlocks[5] is an original short form comedy series of CBeebies television episodes, broadcast with supporting online games that were created by Joe Elliot and developed by Magic Lantern. The online games provide slapstick humour and wordplay developed to support four to six year-olds who are learning to read. The Alphablock characters are twenty-six living letters who fall out of the sky and have a series of adventures. Every episode is different: there are songs, stories and games. The central aim of the programme is to encourage children to become phonologically aware of the alphabet, the letter sounds and the words. As the children become more aware of the ways in which letters are associated with sounds, they are able to predict which words the Alphablocks will make next.

It is recognised that in most pre-school settings, children have often been left to play at the computer independently, with the adult rarely questioning, engaging or guiding the activity (Siraj-Blatchford and Siraj-Blatchford, 2006, Plowman and Stephen, 2007) and this has often lead to unproductive interactions. Our studies have shown that children who enjoy using new media in ICT are able to be

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[4] See Siraj-Blatchford and Siraj-Blatchford, 2009b

[5] http://www.bbc.co.uk/cbeebies/grownups/about/programmes/alphablocks.shtml

engaged and motivated for longer periods of time than more traditionally practiced literacy activities. They are often carried away with what they are doing, sharing their interest with another, at a much deeper level of involvement and learning.

It was found that whilst the researcher and practitioner worked alongside the children to facilitate dialogue and screen interactions, there resulted a "meeting of the minds" where subsequent learning was occurring on both sides. The data below suggests that children benefit more from open-ended questions where the child is encouraged to think and make connections rather than provide for a yes or no answer. As Light and Butterworth (1992) suggested, activities which require joint attention and involve children learning provide for better cognitive challenge than when they work alone. Systematic research has also shown that the use of open-ended questioning is particularly effective in early childhood education (Siraj-Blatchford and Manni, 2008). The following transcription provides a descriptive account of sustained shared thinking in one research setting:

Group 1: Nursery Scenario 3/3, Bournemouth, UK
The participants were Child 1, a 4 year old boy with English as a second language, Child 2, another 4 year old boy and the Researcher. The researcher initially played alongside the children for 10 minutes and then the *children moved onto Game Level 2.* This transcript begins 4 minutes into the activity.
Researcher – We are going to listen to a story and then play a game with the Alphablocks. How do you feel about that?
Child 1 – Nods. *(Watches the Story intently. Pulls his chair closer to the screen.)*
Child 2 – Nods.
(Watching intently and then puts fingers in his mouth. Eyes opening wide during suspense).
Researcher – I will show you the first example so that you know what to do. We are going to be the rescue team. What letter do you think will help make a rescue word that will bring "T" down from the mountain?
Child 1 – Quiet.
Child 2 – Quiet.
Researcher – Let's try "e". Let's drag the letter 'e' onto the red circle here. What sound do you think it makes?
Child 1 – "eh" "eh"
Child 2 – "eh"
Researcher – Lets have a look. E makes "eh". Now if we drag it up, we get "B" "E" "G" – makes BEG. Do you think the word "BEG" can help the Alphablock "T" that is stuck in the mountain?
Child 1 – No
Child 2 – No.
(Computer shows the rescue team unsuccessfully begging "T" to come down.)
Child 1 – My turn.
Researcher – OK. Your turn. What letter would you like to use. What does it sound like?
Child 1 – "O". "oooo…...oooo…"
Computer – "B" "O" "G" – BOG. Bog…eeehhhh..BOG. Brilliant – well done.
Child 1 – Repeating the word BOG. (Looking very pleased with himself for making a word).
Researcher – So, do you think the word "BOG" can help T from up the Mountain?

(Computer shows alphablocks sinking in a bog (wet muddy ground)
Child 2 – No…….
Researcher – So, what should we try next? Who would like to have a try now?
Child 1 – Approaching the touch screen computer and drags the letter "I" making the word "B" "I" "G"
Computer – This is brilliant. We are now BIG. We can now help T off the Mountain.
Researcher – Wow! So what you do you think happened (Child 1)?
Child 1 – The alphablocks have become BIG and are carrying T off the mountain. They are SO BIG. I helped the Alphablock.
Researcher – Yes, that is correct.
Child 2 – I want to play.
Researcher – OK, now its Liam's turn. Do you want to play the same game Liam?

After 10 minutes the children are already good at taking turns and they are helping one another through discourse. At this stage there is less adult interaction to encourage the children's exploratory play. Both the children help each other but the adult facilitator isn't far away and can intervene at any time. Game 2 is a story is about the Alphablocks getting ready to have a party. However, they need help. The children have to think of the word that they need to make to start their party. Finally the exciting "X" makes the alphabets happy and begins the party by making the word SAX and playing some music.

Child 1 and 2 – watching and listening to the storyline of Game 2.
Child 2 – has his fingers back in his mouth, sucking, but watching the screen the whole time.
(The children have to choose a letter to start the party.)
Child 1 – Takes the first turn. Touches the screen and drags the letter "A" onto the empty circle.
Researcher – Can you tell me what sound that makes?
Child 1 – "Aaaaa..."
Researcher – Well done. What do you think you have made?
Computer – "S" "A" "T"
Child 1 – SAT.
Researcher – Do you know what SAT means?
Child 2 – Yes, to sit down.
(The alphablocks on the screen sit down)

Researcher – So, can the word SAT help start a party?
Child 1 – No.
Child 2 – Ok, my turn. (Removes fingers from his mouth). Drags the letter "A" onto the empty circle.
Child 1 – No, that is not the right vowel....
Child 2 – maybe...."Aaaaah...."
Computer – "S" "A" "D"
Child 2 – SAD.
Researcher – Do you think the word SAD will help start the party?
(The alphablocks start crying)

Computer - Now the exciting X can start the party.
Child 2 – Look, the exciting X.

(The X makes SAX and as the music starts the Alphablocks begin to sing and dance. Both children get up and do a little dance. They are very excited and happy. Child 1 gives a happy yell and Child 2 dances in his seat before they get up to dance. Both the children turn towards the Researcher to tell her that exciting X has made the party happy.)

Child 1 – Let's play it again.
Child 2 – (Hand in his face – looking a bit tired) but wants to play again too. The "parachute" man has come to give the other children a chance to play with the parachute and sing some songs. There is a lot of activity in the open plan room.

Child 1 was both excited and anxious, from the very start, to listen and play with Alphablocks. He was able to understand the online storyline and was able to follow the instructions. It became obvious that within the ten minutes of play and guidance, Child 2 had become more aware of some letters of the alphabet and the sounds attached to them; he was able to point to an Alphabet on the wall and repeat the sound as well as the action (and the symbolic sound) attached to the Alphablock. Child 2 had never seen Alphablocks before and he preferred to listen to the storyline twice before taking any action. It would seem that this was his way of becoming familiar with the learning environment. But like Child 1, he was able to understand the online storyline and was able to follow the instructions to help rescue the Alphablocks. By the end of the ten minute session, Child 2 was recognising and sounding out phonemes and both children were playing the games independently with only very limited adult intervention.

The young children were able to explore things, learn in different ways, and from different perspectives. Following Leuven's scale of well-being and involvement (1994) the analysis showed that the children were fully immersed and involved in the process of the activities, within high levels of engagement and motivation, for deep level learning and development. As a result, the pre-school practitioners recognised the need to provide for more ICT educational learning opportunities. In particular, using new media technology for phonic work to become multi-sensory with the potential to capture the child's interest, encourage sustained motivation and reinforce learning in imaginative and creative way.

Conclusions

Robust research evidence from the United States, like the High/Scope Perry Pre-school programme (Schweinhart et al. 1993), and the British Effective Provision of Preschool Education (EPPE) study (Sylva, 2004) has shown that high quality nursery provision can be of lasting benefit to children, particularly children from disadvantaged backgrounds. It is particularly in their interests that we apply all the knowledge that we have to achieve better outcomes.

We have found that many young children, even before the age of 5, are quite ready and eager to playfully engage with phonics. It is therefore likely that children will make the greatest gains in language and literacy if they have an integrated approach which includes BOTH phonics and whole language strategies. But a major challenge for phonics education in early childhood is one of training and the present capability of early childhood educators to teach phonics appropriately. The EPPE research, as well as a number of other studies

all show that the highest quality in Early Years settings is found in provision with a high proportion of trained teachers. It is in these teacher-led settings that pedagogic and curriculum quality is highest and where children's learning outcomes are better. But we have argued that ICT may provide significant scaffolding for less skilled and qualified educators and that this may support significant improvements in learning outcomes. Further empirical research is required to substantiate this.

This paper has also considered one of the significant ways in which changes in our perceptions of knowledge may be leading to changes in the understanding of early childhood education and of the potential role of information and communications technologies (ICTs) applied within those contexts. The paper argues that while it is important to be aware of the postmodern critique, we don't have to *embrace* it. As Michael Apple has argued:

> The postmodern critiques of "truth" may be overstated and may be couched at times in language that borders on arrogance. But they are not necessarily wrong. The rejection of such critiques—if it is done well—can remind us that "fact talk" is still a powerful way of mobilizing support for counter-hegemonic policies in education and the larger society. It also can show how some advocates of postmodernisms in education want it both ways. They constantly rely on certain accepted "truths" (the "realities" of poverty and racism, the impoverishment of millions of people as the global forces of neo-liberalism restructure economies internationally, for example); and yet they then turn around and argue against the existence of "truth." This is but a sleight of hand. But most political and intellectual traditions engage in it. It's a bit more glaring in some postmodernisms since their positions often depend on the rejection of such things (Apple, 2001).

'Emergence' is a philosophical notion that dates back to the earliest writings in 19th Century psychology, and also to classical views of society seen as itself a living organism (Sawyer, p. 14). In terms of the arguments presented, emergence may be considered to involve processes that occur over time that result in the development of higher order structures in the mind (conceptual understandings or schemas). Most significantly in terms of the arguments presented these may relate to particular intellectual, social and cultural competencies and capabilities such as reading, and they are initially developed in social interaction and symbolic manipulation and through the development of communication and collaboration skills.

From this perspective an appropriate pedagogy for reading is one that supports young children in learning the skills, knowledge and attitudes identified as developmental precursors (but not determinants) to reading. These arguments may be extended in the future to encompass the pedagogic knowledge learning of their educators. The perspective we have presented is grounded in a cultural-historical perspective to learning notably informed by the work of Rogoff (2003):

> Rather than individual development being influenced by (and influencing) culture, from my perspective, people develop as they participate in and contribute to cultural activities that themselves develop with the involvement of people in successive generations.

> People of each generation, as they engage in sociocultural endeavours with other people, make use of and extend cultural tools and practices inherited from previous generations. As people develop through their shared use of cultural tools and practices, they simultaneously contribute to the transformation of cultural tools, practices, and institutions (Rogoff et al. 1993).

Young children are learning all the time, and however implicit or hidden it may be in some settings, the curriculum content is always determined by the adults who care for them. The notion of totally 'free' play should therefore be recognised as a myth. The material resources (toys, furniture, props and technology), the activities, and the environments that we offer children define both the opportunities and the limitations for their learning. The linguistic and cultural context that they are immersed in even more fundamentally determines what it is that they learn. It may be a recognition of this fundamental 'truth' of early childhood learning and development that provides the most significant challenge to the early years profession.

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