Play, cognition and self-regulation: What exactly are children learning when they learn through play?

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This paper explores the particular aspects of learning which might be supported through playful activity and reviews research and theory which link children’s play, and particularly pretence or symbolic play, to the development of metacognitive and self-regulatory skills.

Three studies are reported, one observational and two experimental, which have explored this relationship. The observational study involved the video-recording of 582 metacognitive or self-regulatory ‘events’ within Foundation Stage settings. The two experimental studies replicated in different learning domains the classic study of Sylva, Bruner and Genova (1976), which contrasted the problem-solving performance of 3- to 5-year-old children who had experienced a ‘taught’ and ‘play’ condition.

Evidence from the present studies reported and other studies supports the view that play, and particularly pretence or symbolic play, which might be with objects or other children, is particularly significant in its contribution to the development of children as metacognitively skilful, self-regulated learners. Evidence from the observational study indicated that child-initiated playful activities, in small groups without adult supervision, supported the greatest proportion of self-regulatory behaviours. The experimental studies suggested that the experience of the ‘play’ condition was particularly effective in preparing the children for effortful, problem-solving or creative tasks which require a high level of metacognitive and self-regulatory skill.

Metacognitive and self-regulatory development is crucially important in the development of academic skills which involve intentional learning, problem-solving and creativity. An understanding of the relationship between pretend or symbolic play and self-regulation is also helpful in providing clear guidelines for adults working with young children as regards their role in supporting and encouraging play in educational contexts.

It is almost universally accepted within the world of early years education that children learn through play. However, establishing the psychological processes involved, and the precise nature of the learning involved, has proved to be difficult. Play is an extremely difficult phenomenon to define and, perhaps because of its essential spontaneity and unpredictability, has presented significant challenges to researchers. Opinions within the academic research community vary between those who assert that learning in all aspects of development occurs most powerfully through play, and those (see Smith, 1990) who assert that the evidence is rather equivocal, and that learning occurs through many kinds of activities, within which play may have a more limited role.

At the same time, while there is widespread commitment to the value of play for children’s learning within the early years educational community, there is also evidence that practitioners often find it difficult to realise the educational potential of play in practice (see, for example, the study of Reception class teachers by Bennett, Wood & Rogers, 1997). In large part, this appears to relate to their understandable lack of clarity about the essential attributes of play and the nature of children’s learning which emerges from it. In particular, there
are long-standing confusions about ‘structured’ versus ‘unstructured’ play, and about the relative merits of child-initiation and adult involvement (Manning & Sharp, 1977; Smith, 1990).

The purpose of the present paper is to present evidence which suggests that play, particularly pretend or symbolic play, contributes to learning by supporting children’s development of metacognitive or self-regulatory skills, which are in turn crucial in the development of problem-solving and creativity. The apparent failure in much of the literature to establish clear links between play and learning has been, we would argue, a consequence of inadequate analysis of the nature of the learning to which play might make a contribution. Many of the studies reviewed by Smith (1990), for example, attempted to relate play to relatively short-term gains in intelligence or academic skills. More recent research related to learning within developmental psychology, however, has moved away from traditional conceptions of learning as conditioned responses, or as the acquisition of knowledge and skills, and has established the overwhelming significance, for children as learners, of their cognitive and emotional self-regulation (Hacker, Dunlosky & Graesser, 1998; Bronson, 2000; Baumeister & Vohs, 2004). In this paper we aim to review the theory and research, including three studies we have carried out ourselves, which suggest that it is in this aspect of learning that children’s play makes a significant contribution to their development as learners, and that this has implications for the quality of their thinking, problem-solving and creativity. This perspective, we shall also argue, provides constructive practical guidelines for early years practitioners when they are considering the organisation of playful experiences for the children in their classes.

The consequences of young children developing early metacognitive or self-regulatory abilities have been shown to be profound, but also relatively long-term. Veenman and Spaans (2005) have shown that, as children grow older, metacognitive skills make an increasingly independent contribution to learning outcomes over and above that of measured intelligence, and Schneider and Weinert (1989) have similarly demonstrated that the relationship between children’s metamemory knowledge and their memory performance increases with age. Blair and Razza’s (2007) recent study of 3- to 5-year-olds from low-income homes in the US showed that aspects of self-regulation accounted for unique variance, independent of general intelligence, in early maths and reading measured approximately a year later. Over a much greater time-scale, Schweinhart and Weikart (1998) followed a group of disadvantaged children who were randomly allocated to attend one of three pre-school programmes, one of which, High/Scope, encouraged children to follow a pattern of plan-do-review, which crucially supports children in planning, taking responsibility for, and evaluating their own learning. Initially, all three groups showed an increase in IQ. However, a follow-up study when the subjects had reached the age of 23 showed that the High/Scope group were performing to a significantly higher level on a range of ‘real-life’ measures (e.g. rates of arrest, emotional problems, home ownership, and salary).

In order to understand why self-regulatory abilities might impact so significantly on learning over the long term, it is worth considering the nature of the cognitive processes involved. In this regard there are two important relevant distinctions between different kinds of learning. First, there is the distinction between what might be termed ‘incidental’ learning and deliberate or ‘intentional’ learning. We all effortlessly learn and remember an enormous amount of information ‘incidentally’ in our everyday lives, but to learn and remember something intentionally requires effort and involves us in a range of ‘metacognitive’ activities such as planning, selecting cognitive strategies and evaluating our own learning. Work in
the area of metacognition originally stems from the pioneering work of Flavell (1979) and colleagues concerned with young children’s developing abilities to deliberately remember lists of items, a set of cognitive processes he termed ‘metamemory’. He found that young children under the age of around 7 years suffered from what he termed a ‘production deficit’ in that they were perfectly capable of carrying out a rehearsal strategy when directed to do so, and this enabled them to remember the items as effectively as older children. However, they could not spontaneously and independently rehearse when it was appropriate to do so.

The second relevant distinction is that between cognitive activities carried out which are practiced and well understood (and which, consequently, are increasingly automaticised) and those required when the task involves problem-solving and being creative. In his very influential ‘triarchic’ theory of human intelligence, Sternberg (1985) distinguished between three kinds of cognitive processes: ‘knowledge acquisition components’ through which we initially acquire information, skills and strategies, ‘performance components’ which enable us to implement learnt cognitive procedures and strategies, and ‘metacomponents’, higher-order processes used to select and coordinate the activities of the other two components appropriately in relation to the task in hand and to plan, monitor and evaluate task performance.

Consideration of these two distinctions in relation to different types or aspects of learning makes it clear that metacognitive or self-regulatory processes are likely to be particularly significant when cognitive tasks involve effortful attempts to intentionally learn, and when they require us to solve problems or to be creative. As Bruner (1972) argued in his classic paper ‘Nature and uses of immaturity’ it is precisely these higher-order cognitive skills, which he referred to as ‘flexibility of thought’, which are uniquely human and which, he argued, are supported by the extended period of human immaturity or childhood, and by the overwhelmingly playful activities in which children engage during this period.

In fact, there has been a recent resurgence in interest in play amongst developmental psychologists and the evidence for a close relationship between play and various aspects of development and learning is now overwhelming. Bornstein (2006), for example, has reviewed the extensive evidence of the inter-relationships between the complexity and sophistication of children’s play, particularly their symbolic or pretend play, and their emotional well-being. The significance of symbolic play has been called into question by some commentators, mostly on the grounds of cultural variations. However, following an extensive review of the considerable current anthropological and psychological literature on culture and play, Bornstein concludes that ‘pretend play (including role play and sociodramatic play) appears to be universal’ but that it ‘typically expresses concerns that are culture specific’ (p.115). So, for example, Gaskins (2000) found no evidence of ‘fantasy’ play amongst Mayan children, as this kind of pretense would be considered to be untruthful, but did find extensive evidence of children enacting role play scenarios of everyday Mayan adult life.

The relationships between play and cognition have been equally well established. Tamis-LeMonda and Bornstein (1989), for example, demonstrated that infant habituation (an established measure of speed of processing) predicted the amount of symbolic play later engaged in by individuals as young children. The impact in turn of play on cognition has been mostly researched using variants of Sylva, Bruner and Genova’s (1976) classic study of children’s problem-solving abilities. Typically in these experiments, one group of children was given the opportunity to play with the objects involved, while the other group was ‘taught’ how to use the objects in ways which would help solve the problem. Consistently,
the two groups subsequently performed at a similar level, in terms of numbers of children completing the task with total success, when they were individually asked to tackle the problem. However, in the ‘taught’ group there tended to be an ‘all or nothing’ pattern of responses, with the children either succeeding immediately by accurately recalling and following their instructions, or giving up following an initial failure. By contrast, the children who had the experience of playing with the materials were more inventive in devising strategies to solve the problem and persevered longer if their initial attempts did not work. The same proportion of children as in the ‘taught’ group solved the problem almost immediately, but many of those who didn’t solved the problem at a second or third attempt, or came close to solving the problem, by trying out different possibilities. As Smith (2006) reviews, these original studies were subject to some methodological criticism. However, subsequent work by Pellegrini and Gustafson (2005), in which observational data was collected of 3- to 5-year-olds over an entire school year, demonstrated that the amount of playful exploration, construction and tool use in which children engaged predicted their subsequent performance on a lure retrieval problem solving task very similar to that used by Sylva et al. (1976).

Much of the recent work concerned with children’s play, and particularly that related to educational contexts, however, has been inspired by the enormously influential theoretical ideas developed by Vygotsky (1978). These contain two further insights about the cognitive mechanisms by which play might contribute to effortful, intentional learning, problem-solving and creativity.

First, he specifically relates play to children’s developing sense of control and self-regulation of their own learning. During play, he argued, children create their own ‘zone of proximal development’, i.e. they set their own level of challenge, and so what they are doing is always developmentally appropriate (to a degree which tasks set by adults will never be). This also involves the notion that play is spontaneous and initiated by the children themselves; in other words, during play children are in control of their own learning. Guha (1987) has presented a range of evidence that this control element of ‘self-regulation’ is particularly significant in learning. For example, she cites experiments concerned with visual learning in which subjects are required to wear ‘goggles’ which make everything look upside down. They are then required to sit in a wheelchair and learn to move safely through an environment. The results of such experiments show that subjects moving themselves around the environment (and having a lot of initial ‘crashes’) learn to do this much more quickly than those who are wheeled safely about by an adult helper. The parallels here, with Sylva et al. (1976) ‘play’ and ‘taught’ groups is striking.

Specifically neo-Vygotskian work has also explored the development of cognitive self-regulation and control relating to particular types of play. Karpov (2005) has provided a useful review of this work, within which he notes that Vygotsky’s contention that socio-dramatic play has a significant role in the development of self-regulation has been supported by a range of research mostly focusing on attentional and emotional self-regulation (Elias & Berk, 2002; Berk, Mann & Ogan, 2006). Intriguingly, when looking at the specific mechanisms of learning development, Vygotsky also argued that children’s use of verbal tools to regulate the behaviour of others was a significant factor in their development of self-regulation. A study of 3- to 7-year-old children ‘standing sentry’ by Manuilenko (1948) illustrated how this might work. Children standing sentry in a room containing playmates managed to stand motionless for significantly longer than when they were on their own. This appeared to be a consequence of the playmates ‘monitoring’ the ‘sentry’s’ performance.

Second, Vygotsky argues that play makes a crucial contribution to the development of symbolic representation. Human thought,
culture and communication, he argues, are all founded on the unique human aptitude for using various forms of symbolic representation, which would include drawing and other forms of visual art, visual imagination, and language in all its various forms, mathematical symbol systems, musical notation, dance and drama. Play is recognised in this analysis as the first medium through which children explore the use of symbol systems, most obviously through pretence. Play becomes, in this view, a ‘transition’ from the ‘purely situational constraints of early childhood’ to the adult capability for abstract thought. So, as an adult, when you have had an interesting experience, upon which you wish to reflect, or a problem to solve, or a story to write, you have the intellectual tools to do this in your mind. Lacking these tools, the argument follows, children require the support of real situations and objects with which the ideas are worked out through play. The significant link here with later research concerned with children’s thinking, problem-solving and creativity is the widespread finding of the significance of representational processes in these areas of development. Bruner’s (1964) model of enactive, iconic and symbolic forms of representation and Karmiloff-Smith’s (1992) model of representational redescription (RR theory) have been perhaps the most significant contributions in this area.

Further empirical support for Vygotsky’s argument regarding the link between pretend play and the development of symbolic representational abilities in children has come from a study by Berk et al. (2006), who reported a series of observational studies of 2- to 6-year-old children in which they recorded the incidence of ‘private speech’. In Vygotskian theory young children’s tendency to talk to themselves, or self-commentate, while they are undertaking a task, is of great significance and forms an important link between the notions of self-regulation and symbolic representation. It is certainly a very prevalent phenomenon, reportedly accounting for between 20 and 60 per cent of pre-school children’s utterances. Vygotsky argues that such speech is an important step in the processes by which children learn to represent ideas to themselves in language and learn to use language to self-regulate their activities. It is an intriguing notion and one that is perhaps supported by the common observation among adults that they find themselves engaging in the same kind of behaviour when attempting to think through a challenging problem or set of ideas. In the studies reviewed by Berk et al. (2006), significantly, they found particularly high levels of private speech among 2- to 6-year-old children during make-believe or pretend play.

The present studies
Our own research in this area has been of two complementary kinds. Within the Cambridgeshire Independent Learning in the Foundation Stage (C.Ind.Le) project (Whitebread et al., 2005; Whitebread et al., 2007; Whitebread, 2007) 582 metacognitive or self-regulatory ‘events’ were identified from video-recorded data of activities in Foundation Stage classrooms. Many of the events showing the richest evidence of self-regulatory behaviour were playful, but also involved children in collaborative problem-solving which required them to reflect and talk about their own thinking or activity.

In two other studies (Whitebread & Jameson, 2005; Lander, 2007) a more experimental approach was adopted. Here, the original classic experiment of Sylva et al. (1976) was adapted to examine the consequences of a ‘play’ and a ‘taught’ condition. The results were consistent with views that play impacts upon self-regulation and metacognitive processes, and as a consequence its effects emerge most clearly in tasks and aspects of development which involve problem-solving and creativity, rather than simpler recall and non-strategic learning.
The C.Ind.Le Project
This was a two-year project which involved 32 Foundation Stage practitioners and their nursery or Reception classes. The practitioners, who were invited to be involved in the project based on their excellent practice and openness to pedagogical innovation, developed playful activities or opportunities which were constructed, based on existing literature, to provoke metacognitive or self-regulatory behaviours. These activities, therefore, normally required the children to solve a problem or be creative, with children working individually or in collaborative groups; some activities were constructed to involve peer tutoring; some activities included adult participation. A guiding principle was that all activities were negotiated and all child initiatives were encouraged. Often activities or opportunities were taken by the children in quite different directions to those envisaged by the practitioner. While video-recording these activities, spontaneous, entirely child-initiated activities were also recorded; as is often the case, these activities usually involved the children in setting themselves goals or problems. ‘Events’ were recorded both inside classrooms, and in outside play areas; across all areas of the Foundation Stage curriculum; and involving a wide range of different play types, including construction, object-play, pretence, role-play and so on.

In order to code the behaviours observed within the recorded events, an analytical model of self-regulation, developed originally by Pino Pasternak (2006), was used and further developed within the project. This model involved the three main aspects of metacognition or self-regulation identified in the literature:

- **Metacognitive knowledge** (Flavell, 1987): the individual’s knowledge about personal, task and strategy variables affecting their cognitive performance.
- **Metacognitive regulation** (Brown, 1987): processes taking place during ongoing activities involving planning, monitoring, control and evaluation.

- **Emotional and motivational regulation** (Boekaerts, 1999; Zimmerman, 2000; Corno, 2001): the learner’s ongoing monitoring and control of emotions and motivational states during learning tasks.

As reported previously (Whitebread et al., 2007), the data derived from this coding was analysed at three levels of increasing depth and, at each stage, care was taken to establish acceptable levels of inter-coder reliability. The levels achieved, based on double coding of between 10 per cent and 20 per cent of the data set at different levels, ranged from 74.8 per cent to 96.1 per cent.

A first general analysis showed that, of the 582 events which were clearly identified as containing at least some of these aspects of self-regulation, 376 (64.6 per cent) were child-initiated, while only 114 (19.6 per cent) were adult-initiated and 92 (15.8 per cent) were jointly initiated. Further, while only 21 (3.6 per cent) involved a whole class working together, and 116 (19.9 per cent) involved individual children working on their own, an impressive 445 events (76.5 per cent) involved children working in pairs or in small groups. Finally, these 582 events were analysed for the degrees of both collaboration and talk, according to whether there was none, it was intermittent or extensive. Figures for the numbers of events showing no collaboration and talk were 155 (26.6 per cent) and 44 (7.6 per cent) respectively; for intermittent levels the figures were 148 (25.4 per cent) and 144 (24.7 per cent); and for extensive levels they were 279 (47.9 per cent) and 394 (67.7 per cent).

Taken together, this initial data suggested that, within the 3- to 5-year-old range, we were finding extensive evidence of metacognitive or self-regulatory behaviours which most frequently occurred during learning activities which were initiated by the children, involved them in working in pairs or small groups, and which involved extensive collaboration and talk. However, as the figures above show, around one-in-five of the recorded events involved children working alone, and within these there were many examples of private
speech. Figure 1 reports a simple, but very clear, example of a child, Ruby, using private speech to help herself carry out the task of placing the correct number of candles on a pretend birthday cake for her sister.

As has been reported elsewhere in the literature, we did, however, find that the adult practitioners, who had been selected to be part of the project because of their generally excellent practice, struggled to participate effectively in the children’s play. Figure 2 reports an analysis of the prevalence of behaviours showing evidence of the three aspects of self-regulation according to the level of adult involvement in events. As this reveals, as the level of adult involvement increased, the rate of behaviours showing evidence of metacognitive knowledge increased slightly (usually in response to adult questioning), but the rate of behaviours showing children regulating the cognitive or emotional/motivational aspects of the activity markedly decreased.

There were, however, some excellent examples of practitioners who managed to participate in, or support, the children’s playful activities without completely taking over the regulatory role. In one event, for example, a practitioner supported a young 3-year-old boy attempting to put on a fireman’s jacket. The child’s friend had already donned a policeman’s jacket and helmet, and was waiting to play, so he was keen to put on the jacket as quickly as possible, but was having difficulty. This is clearly a situation in which he could easily have become frustrated, angry and upset. It would have been very easy for the nursery teacher to have quickly put the jacket on him to avoid this potentially distressful situation. If she had done this, however, she would have removed the problem for the child and the opportunity for the child to regulate his own emotions so that he could complete the task for himself successfully. All together, from the child’s initial attempt to the point where he finally succeeded in putting on the jacket correctly, with it the right way around and both arms through the correct sleeves, the event lasted well over three minutes. During all this time, at no point did the nursery teacher touch the jacket. What she did do, however, was provide attention (talking to him about the problem and focusing her attention on him throughout), provide emotional support (smiling throughout, laughing positively and playfully when the jacket fell to the floor, encouraging him enthusiastically and expressing delight at each successful move) and provide clear visual guidance (demonstrating ‘putting your arm in like this’) which enabled the boy, after around three minutes of struggle and perseverance (a very long time for a 3-year-old), to finally put the jacket on entirely by himself. The delight on the boy’s face and his obvious sense of achievement made it clear that this simple little everyday event had been transformed by a piece of excellent practice into a very powerful piece of learning in self-regulation. It is no surprise to hear that every day, for the next two weeks, the first thing that this boy wanted to do when he arrived at the nursery was to put on the fireman’s jacket. The lessons that this little boy had learnt from this incident in terms of perseverance, emotional control and self-efficacy are self-evident.

The experimental tasks
Alongside this observational study, we have also carried out two experimental studies based upon and developing the classic Sylva et al. (1976) study. Space does not allow more than a general overview of these studies in this paper. However, details of the experimental procedures may be found in previous reports (Whitebread & Jameson, 2005; Lander, 2007). The focus in both studies was to investigate the kind of learning that the experience of playful activities would support. So, in both studies, children experienced a ‘taught’ and ‘play’ condition, but the impact of these experiences were explored in relation to creative or problem-solving tasks likely to draw upon self-regulatory and metacognitive processes rather than simple recall or non-strategic tasks.
**Figure 1: Birthday candles**

Ruby has placed a large lump of play dough in the top of a plastic mug. She explains to two other children, who are engaged in their own dough-related activities at the same table, that she is making a birthday cake. She has stuck three drinking straw ‘candles’ in the top of the dough ‘cake’.

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<th>Observed Activity</th>
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| **Ruby:** Pointing to each drinking straw candle in turn, matching one candle to one counting word.  
1, 2, 3 candles.                                                                  | In this observation a familiar strategy, counting, is applied to a new situation. The cognitive process is supported by the non-verbal gesture of pointing.  
**Control and regulation:** Applies a previously learned strategy to a new situation, in this case supported using a non-verbal gesture. |
| **Ruby now adds further drinking straw candles, one at a time. At each addition she says the next number word in the counting sequence.**  
4 candles, 5 candles, 6 candles, 7 candles, 8 candles, 9 candles                   | There is no evidence to suggest that these utterances are directed at any other member of the group and so may be interpreted as a self-commentary, in which the verbalisation is related to the degree to which performance is progressing towards a goal.  
**Monitoring:** Self-commentates.                                                   |
| **After adding the ninth candle Ruby holds her hands either side of the completed cake in a cradling gesture. She smiles broadly.**  
There! This is for my sister … And she'll love it!                                 | The pleasure in having completed the cake is evident in the tone of this utterance, an interpretation supported by the use of facial expression.  
**Emotional/motivational monitoring:** Expresses awareness of positive emotional experience of a task.  
The second element to the utterance also indicates that the outcome of the task has been evaluated in relation to the intended goal, and has been deemed to be successful.  
**Reflection and evaluation:** Evaluating the quality of performance.               |
| **Ruby starts to pick up the dough cake by gripping the straw candles. Almost immediately she puts the cake down again and changes her grip, placing her hand around the plastic mug in which it has been constructed. In this manner she carries the cake away from the table.** | The activities observed here suggest that through cognitive monitoring an initial, ineffective strategy is changed to a more successful one.  
**Control and regulation:** Changes strategy as a result of monitoring.             |
In the first study (Whitebread & Jameson, 2005), rather than practical problem-solving, we were interested to see if the same kind of pattern observed between play and taught conditions would emerge in relation to the rather different area of children’s oral and written storytelling. We also deliberately chose a sample of able and slightly older children partly to counter the common misconception that play is mostly beneficial to younger or less able children. This sample consisted of 35 Year 1 and Year 2 children (aged 5 to 7 years) in an independent school with an average IQ (as measured by Ravens Progressive Standard Matrices IQ Test) of 131, which is within the top two per cent of the population as a whole. Every child in the group had a reading age at least six months above his/her chronological age.

Following the general structure of the original Sylva et al. (1976) study the children were asked to produce oral and written stories after they had been read a story and had experience of story props under ‘play’, ‘taught’ and ‘control’ conditions. The children were read three different stories in groups of 10 to 15, using a picture book version. In the ‘play’ condition, the group was then allowed 10 minutes to play with the story props in groups of five without any intervention from the teacher. In the ‘taught’ condition, the teacher then worked with the group for 10 minutes discussing and modeling with the story props other possible stories, but did not allow the children to handle the props. In the ‘control’ condition, the children were shown photocopied sheets of the story characters with their names, but no further help or guidance was offered. All the groups were then asked to write their own stories containing one or more of the characters in the story they had just heard. It was emphasized that this should be different from the original story. Later in the day, after each condition, the children were also given the opportunity to record an oral story using the same story characters.

The written stories were analyzed according to the time taken to write them, the number of words they contained, their ‘National Curriculum level’, using national government guidelines (QCA, 2001), and the number of points of information, beginnings, conflicts and resolutions which were the same or different from that in the original story. Their oral stories were assessed for the time taken to tell them, the number of ‘prompts’ needed and the confidence with which they were told.

Figure 2: Self-regulation and adult involvement

Adult involvement:
0 = none; 2/3 = intermittent/passive/guided by children; 4 = adult guided.
The results of the analysis of the children’s written stories arising from the three conditions showed that in the ‘taught’ condition, although the children included more conflicts and resolutions in their written stories than the control group, they spent less time writing their stories than in the other two conditions, and they included more ‘same’ points in relation to the original story than the ‘play’ condition and fewer ‘different’ points than either of the other two conditions. They also included more ‘same’ resolutions than either of the other two conditions.

In the ‘play’ condition the children also included more conflicts and resolutions than the control group. However, more of these conflicts and resolutions were different from those in the original story than in either of the other two conditions and their stories were of higher quality (as measured by NC levels) than in the ‘taught’ condition.

The analysis of the children’s oral storytelling showed that in the ‘play’ condition the children showed more confidence than in either of the other two conditions. This difference appears to have been mostly attributable to a greater number of children lacking confidence after the ‘taught’ condition. After the ‘play’ condition the children also showed more confidence in the oral storytelling activity than their teachers had observed in their regular classroom activities. It is important to note that this was a repeated measures design, and so these results are for the same 35 children experiencing different pedagogical practices.

In the second study (Lander, 2007) a repeated measures design was also used with a sample of 16 nursery school children aged 3- to 4-years-old. This study aimed to examine the impact of ‘play’ and ‘taught’ conditions again, but this time with a spatial task involving a magnetic shapes game and, following an interesting study by Pepler and Ross (1981), involving a closed or ‘convergent’ task with only one correct solution and an open, ‘divergent’, more creative task with an infinite number of possible different solutions. The closed task involved the child in completing a pattern from which there were missing shapes, and the open task involved using the shapes to make a picture of the child’s free choice, having been shown an example picture of a man constructed by the researcher. In the ‘play’ condition the children were given just five minutes to play with the magnetic shapes before they completed either the closed and open tasks, and in the ‘taught’ condition, which also lasted five minutes, they practised with the researcher, either matching shapes and colours prior to the closed task or making a copy of the picture of a man prior to the open task. The measurements used for the closed task were time taken, number of pieces entered and number of pieces correct and for the open task the time taken to complete the picture, originality (measured in two ways: uniqueness – based on verbal description – and percentage of shapes used differently from the man picture) and fluency (number of pieces used). The level of the children’s ‘involvement’ in each of the conditions and tasks was also assessed using the Leuven Involvement Scale for Young Children (LIS-YC) developed by Laevers (1994).

The results showed a significant difference between the times the children persevered on the tasks depending on the preceding condition. They persevered significantly longer on the open task when the play condition preceded and on the closed task when the taught condition preceded. There was no significant difference between the number of pieces used in either task dependent on the preceding condition. However, in the closed task, the children placed significantly more pieces correctly if the preceding condition was taught. There was a significantly greater level of originality on the open task (on both measures) when a play condition preceded the task compared to a taught condition. While the level of involvement of the children in the taught/open and play/closed conditions decreased from the condition to the task, and remained the same in the taught/closed conditions.
condition, it significantly increased in the play/open condition. While this is a small study the results clearly support the position that playful experience is particularly effective in preparing children for effortful, problem-solving or creative tasks which require a clearly higher level of metacognitive and self-regulatory performance.

Conclusions and implications for play in educational settings

Despite the difficulties of research in this area, there is now a considerable body of evidence within the psychological literature supporting the role of play, and particularly pretend or symbolic play, which might involve objects or other children, in particular kinds of learning. Further, as we have argued in this paper, this research is of particular significance for play within educational settings, as it appears to have its most significant impact in relation to effortful, intentional learning involved in the development of problem-solving and creativity skills.

This paper has reviewed some of this evidence and related theory and has presented some of the authors’ own studies focusing on the involvement of play in supporting the development of metacognitive and self-regulatory skills, including representational abilities, which are particularly significant in intentional learning. These studies have, in the case of the observational work, been located in Foundation Stage classrooms, or, as in the case of the more experimental studies, been located in educationally relevant domains (writing and visual art).

As we stated at the outset of this paper, we believe this to be an important perspective, both in the way it advances our understandings about the relationships between play and learning, and because it provides clear guidelines for practitioners in their attempts to provoke and support play in their classrooms in ways which are likely to be most productive for children’s learning. Some of the present authors and others have written elsewhere concerning the implications of supporting children’s self-regulated learning for the classroom environment, for learning activities and for teacher-child interactions (Bronson, 2000; Featherstone & Bayley, 2001; Perry et al., 2002; Whitebread 2007; Whitebread & Coltman, 2007). The procedures and practices which these authors have promoted generally apply equally and perhaps particularly, to the support and encouragement of playful activity in educational contexts. The four principles derived from Whitebread and colleagues’ C.Ind.Le study, for example, of emotional warmth and security, children’s initiation and feelings of control, cognitive challenge through problem-solving and creativity, and talk about learning (including private speech and collaborative talk), all clearly apply and are highly relevant to the organisation and support of productive play.

In our experience, also, the notion of self-regulation, properly understood, has proved to be of enormous help to practitioners when they are considering their own role in children’s play. We have cited one particular example from the C.Ind.Le project of some excellent practice in supporting a child to progress in his ability to self-regulate his emotions, but there were many other examples of adults involving themselves in children’s play in ways which moved the play on, increased the cognitive challenge, facilitated representations by providing new ideas and vocabulary, but did not take over the regulatory role. This requires skill and sensitivity, but a clear understanding of the importance of self-regulation in children’s learning significantly helps teachers of young children to interact more productively in playful conte

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References


