AGE-
APPROPRIATE
PEDAGOGIES

Foundation paper

Age-appropriate pedagogies for the early years of schooling

Queensland
Government

Terms of reference

The Department of Education and Training has invited Griffith University to submit a paper that:

- reviews the research literature to identify age-appropriate modes of teaching and learning in the early years of schooling;

- supports the value of active teaching and learning approaches in the early years of schooling in terms of children's engagement and achievement of learning outcomes; and

- links age-appropriate pedagogy to the expectations of existing departmental accountabilities of schools.

This paper reviews the research literature to inform learning and teaching practices in the early years of schooling.

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1 Introduction

The purpose of this paper is to review key literature and research on age-appropriate pedagogies in the early years of schooling. It examines the features of age-appropriate pedagogies that engage young children and achieve effective learning outcomes, and considers the alignment of these learning and teaching approaches with current school accountability expectations.

The paper is guided by a belief that debates which position pedagogical approaches as binary opposites are unhelpful. For example, it rejects the notion that play and explicit instruction are mutually exclusive, offering instead the view that they can co-exist and that both are beneficial, dependent upon the participants, context, purpose, and duration of learning experiences. As such, this paper adopts the view that pedagogies need to be varied and also recognises the co-constructed nature of pedagogy. This perspective recognises that pedagogies need to take account of age, background, and abilities of individual learners as well as the interests of both children and teachers. These beliefs frame this discussion and are provided here in order to ensure that the possibilities inherent within a range of pedagogical approaches, including play-based approaches, are presented.

There are six sections in the paper. Included in this introduction is a rationale justifying the value of age-appropriate pedagogies as well as considerations for the Queensland context. The second section presents perspectives on effective pedagogy and outlines what is meant by age-appropriate pedagogies, particularly for learners in the early years of school. This section is followed by one that draws on key international research literature to identify themes and messages that inform pedagogical principles, approaches and practices in early years' education. The fourth section examines literature about pedagogies related to holistic development and curriculum, while the fifth outlines the characteristics of early years' age-appropriate pedagogies. Finally, the paper concludes with a summary of what the research literature has revealed in key messages to inform decision-making processes and provides characteristics of age-appropriate pedagogies aimed at supporting their effective use in the early years in Queensland schools.

1.1 Why age-appropriate pedagogies

Nationally and internationally, education policy is increasingly being informed by an economic and social investment agenda (Irvine & Farrell, 2013) and fuelled by increased global competition and comparison (Ang, 2014). Within Australia, education has long been recognised as a critical factor in enhancing living standards, life expectancy, and health for all; however, these goals have given rise to increased pressure to introduce formal education to children at a younger age (Cheeseman, Sumsion, & Press, 2014). To improve learning outcomes for Australian children, an annual national assessment program in literacy and numeracy (NAPLAN) was implemented in 2008 followed by the development of an Australian Curriculum in 2012 to ensure curriculum consistency across States. The implementation of this formal, content-oriented curriculum, together with Queensland Government's (2015) Curriculum to Classroom (C2C) units of work that assist teachers to implement it, has resulted in whole-class teaching and the use of direct instruction methods in many early years' classrooms.

In addition, there has been a growing trend for national and international comparisons of older children's educational outcomes (e.g., the *Programme for International Student Assessment* [PISA] and *Trends in International Mathematics and Science Study* [TIMMS]). As a consequence, reforms aimed at improving results in these tests often result in higher standards for academic achievement being set for students in the early years of school. Such reforms have a flow-on effect that formalises curriculum and pedagogy. As a result, play-based and active learning approaches have been increasingly rejected, whilst opportunities for physical activity have been substantially reduced in favour of more formalised, pencil-and-paper related activities. For these reasons, the transition to school has become far more difficult for some children (Dockett, Petriwskyj, & Perry, 2014).

A study of effective preschool education in the United Kingdom (UK) (Sammons et al., 2002) suggests that successful transitions provide a positive start to school that may create long-lasting educational and social benefits for children. A positive start is also seen as contributing to stronger connections with school, which in turn have been identified as a factor in disrupting cycles of social and economic disadvantage (Smart, Sanson, Baxter, Edwards, & Hayes, 2008).

The *Melbourne Declaration on Educational Goals for Young Australians* (Ministerial Council on Education, Employment, Training and Youth Affairs, 2008) outlines a commitment to strengthening early childhood education. The need to establish foundation learning – socially, physically, emotionally and cognitively – as well as to support a successful transition to school are reinforced by the consequent likelihood of students who access quality early childhood education staying in school, engaging in further education, and participating in work and community life as adults.

In stark contrast to this situation, research is currently indicating that the application of pedagogies that are narrowly focussed on the development of specific curriculum goals, especially those that are emphasised in national testing processes, tend to limit the child's holistic development and can have unintended consequences that may restrict children's long-term learning. This is especially the case for children in the early years of schooling where pedagogies that integrate play and learning are needed (Pramling Samuelssson & Asplund Carlsson, 2008).

In addition, the impact of globalisation and advances in technology mean that children in the 21st century need to be particularly adept at problem solving, gaining new knowledge and developing innovative responses to complex issues. They need to engage with problems with perseverance to transform, adapt, synthesise, and create solutions in collaboration with people, their environment and technologies. They need to be creative, drawing on their imaginations to assimilate and learn complex information using their senses (Thomas & Brown, 2011). However, they also need to engage and learn deeply in a scientific manner, demonstrating logic and causal links through experimentation from a very young age (Gopnick, 2012).

Children therefore need opportunities to develop and utilise their learning capacities in activities that engage and stimulate high levels of concentration, interest and enjoyment (Shernoff, Abdi, & Anderson, 2014). To create these opportunities, teachers need a balanced focus on the development of children's academic, social, emotional, physical, cognitive and creative skills, as well

as an extensive repertoire of pedagogies that take into account the age, background, abilities, interests and characteristics of individual learners, as well as the context and purpose for their teaching.

1.2 Queensland context

The Queensland Government's Department of Education and Training has demonstrated a strong commitment to making children's transition to school successful and has identified this as a core outcome within both the *Strategic Plan 2014-2018* and the *Every Student Succeeding: State Schools Strategy 2014-2018*. This focus on the importance of the transition to school is supported by a collaborative empowerment model and the *Supporting Successful Transitions: School Decision-making Tool* that emphasises that pedagogy needs to be "appropriate and evidence-based" (p. 4). The tool supports responsive environments and the use of "a range of early years pedagogical approaches" including differentiation and planning for transitions so that there is a "continuum of practice" (p. 15).

However, in spite of these policy documents and tools, it would appear that the introduction of the Australian Curriculum has been misinterpreted by some as the introduction of a set of formal instructional approaches. Here, a distinction between the curriculum (what is taught) and the pedagogy (how it is taught) has not been made. This misrepresentation has occurred despite the Australian Curriculum, Assessment and Reporting Authority (ACARA) encouraging teachers, especially in the first years of school, to use their professional judgement and pedagogical repertoire to "accommodate the varied learning experiences and diverse backgrounds that children bring to school, flexibly apply the key principles and practices of early childhood teaching, and recognise the complex and integrated nature of learning" (p. 6). ACARA identifies quality early childhood education before and into school as applying the principles and practices articulated in the *Early Years Learning Framework* (Australian Government, 2009) of:

- high expectations and equity;
- respect for diversity;
- ongoing learning and reflective practice;
- holistic approaches;
- responsiveness to children;
- learning through play;
- intentional teaching;
- cultural competence;
- continuity of learning and transitions; and
- assessment for learning.

In the next section, we consider what is meant by the term pedagogy and present various perspectives on pedagogy drawn from the literature. These reflect differing ways of thinking about learning and teaching.

2. Pedagogy

The literature offers various contemporary perspectives on pedagogy. Alexander (2015) describes it as "both the act of teaching and the ideas, values, knowledge and evidence that shape and justify it" (p. 253). He goes on to suggest that it is "what the teacher needs to know in order to make valid, effective and defensible classroom decisions" (p. 253). Such a view is focused squarely on the teacher's role and purpose in facilitating learning. Our concern with such a view is that teaching may be conceptualised as separate from the learning process.

Others see pedagogy as more of a relationship between teacher and learner. Harris (2015) and Hargreaves and Shirley (2009), for example, suggest that personalised learning responds directly to the diverse abilities of individuals rather than imposing a "one size fits all" model, and actively engages children in the process of learning. Bishop, Ladwig, and Berryman (2014) see relational pedagogy more in terms of being culturally responsive and inclusive. They suggest that by adapting approaches, teachers can acknowledge and build the unique abilities of all learners. Brownlee (2004) describes "relational pedagogy as validating respect to the learner as a knower, supporting learning experiences that correspond to one's own experiences, and encouraging a constructivist approach to learning by demonstrating meaning-making rather than knowledge-making" (cited in Harris, 2015, p. 10).

Another perspective presents pedagogy as a collective construction that teachers and learners co-create within a community of learners (Bielaczyc, Kapur, & Collins, 2013). In such a view pedagogy is seen as a process of co-creating patterns of classroom interactions. These interactions are motivating and engaging, playful and challenging, spontaneous and important and involve challenge and support (Shernoff et al., 2014).

Within the context of early years' learning, the term pedagogy has not always been well accepted, with some teachers resisting the role of the pedagogue. As a result, Alexander (2004) has raised concerns about the absence of systematic pedagogy in practice or policy making in the primary and early years, whilst Stephen (2010) has referred to pedagogy as "the silent partner in early years learning" (p. 15). She draws on the work of Moyles, Adams, and Musgrave (2002) to argue that "inhibitions about engaging in debate over pedagogy may hinder support for children's learning and may also limit professional growth of educators" (Stephen, 2010, p. 18).

Whilst the pedagogical perspectives presented here share the common goal of facilitating learning, they are informed by very different beliefs about the teaching and learning process. These range along a continuum from the singular construction of the teacher as a pedagogue who scaffolds the learner's knowledge acquisition through instruction, to the collective construction of a community of learners in which knowledge, as well as teaching and learning practices, are jointly constructed through social interaction. Whatever perspectives inform teachers' pedagogy, the approaches and practices that teachers use must be validated by a strong research evidence base that affirms their effectiveness in facilitating learning. Indeed, Alexander (2013, p. 3) calls upon teachers to "develop

a pedagogy of repertoire, evidence and principle, rather than mere compliance with habit or official fiat". He claims that it is only through these three aspects that the real power of teaching can be exploited.

2.1 What is effective pedagogy?

Effective pedagogy is dependent on a number of variables that include the goal or purpose for what is being taught. For this reason there is no one right approach. However there have been many research-based theories and principles that have contributed to an understanding of what constitutes effective pedagogy. These include, for example, Glasser's (1986) choice theory, that proposed that learners' needs for survival, belonging, power, fun and freedom need to be addressed if pedagogy is to be effective, and the Queensland School Reform Longitudinal Study (QSRLS) (Lingard et al., 2001) which identified 20 elements of effective pedagogy. These elements, referred to as productive pedagogies, relate to four broad areas of teaching and learning: intellectual quality, supportive classroom environment, recognition of difference, and connectedness. Productive pedagogies are used as a reflective tool to ensure all students, regardless of background, are engaged in intellectually challenging and relevant curriculum in a supportive environment (Queensland Government, 2001).

More recently, the findings from 22 major research projects conducted in schools in the UK as part of the Teaching and Learning Research Programme were analysed and 10 evidence-based principles of effective pedagogy were proposed. These principles, focused on the learner, are that effective pedagogy: equips learners for life in its broadest sense; engages with valued forms of knowledge; recognises the importance of prior experience and learning; scaffolds learning; ensures assessment is congruent with learning; promotes the active engagement of the learner; fosters both individual and social processes and outcomes; recognises the significance of informal learning; depends on the learning of all those who support the learning of others; and demands consistent policy frameworks with support for learning as their primary focus.

By contrast, Husbands and Pearce (2012) reviewed research to identify nine teacher-focused claims about pedagogies. They suggest that effective pedagogies: give serious consideration to student voice; depend on behaviour (what teachers do), knowledge and understanding (what teachers know) and beliefs (why teachers act as they do); involve clear thinking about longer-term learning outcomes as well as short-term goals; build on students' prior learning and experience; involve scaffolding students' learning; involve a range of techniques, including whole-class and structured group work, guided learning and individual activity; focus on developing higher order thinking and metacognition, and make good use of dialogue and questioning in order to do so; embed assessment for learning; and are inclusive and take the diverse needs of a range of learners, as well as matters of student equity, into account. They used the term *pedagogies* rather than pedagogy to capture the variety of successful pedagogic practices that differ across age ranges and between subjects.

From the abundance of theories and principles developed over time, the importance of three crucial elements has endured. These are that effective pedagogy is learner centred, involves the scaffolding of learning, and engages students actively in learning. To ensure quality teaching, these

three elements need to be incorporated into any pedagogical framework that is generated at school level. Pedagogical frameworks such as those required by Queensland Department of Education and Training (n.d.) recognise the power of school-based pedagogies that are embedded in the community and developed collaboratively. One of the core principles of the Department of Education and Training's policy in relation to the development of pedagogical frameworks is the need to align curriculum, pedagogy and assessment. It is the responsibility of school members to develop collaboratively a pedagogical framework that is validated by research, considers educational goals, responds to the school and community context, considers the needs, characteristics, and interests of the learners and teachers, provides opportunities for flexibility and choice, and is age appropriate.

Age-appropriate pedagogies attend to the variety of contextual, instructional, developmental and interpersonal factors that impact on learning. Similar to others (see Husbands & Pearce (2012) above) we use the term pedagogies to embrace the rich array of pedagogic practices associated with education in the early years. Whilst learning processes do not fundamentally change as children become adults (Goswami & Bryant, 2010), it is the development and experience of individuals, and their ability to self-regulate and think metacognitively, that distinguish them as learners. Therefore, teachers need to consider the development, experience, and associated characteristics of the learner and select appropriately from a broad repertoire of pedagogical approaches tailored accordingly. Before we examine the research literature on learning and teaching in the early years, let us consider contemporary perspectives on the characteristics of early learners.

2.2 Characteristics of early learners

Theories from a variety of disciplines including psychology, sociology, education and science contribute to contemporary views of early learners. They include post-development, constructivist, sociocultural-historic, post-structural and post-modern theories that are grounded in the enduring work of a range of well-known theorists including Froebel, Rousseau, Piaget, Vygotsky, Bronfenbrenner, Rogoff and Dewey, to name a few. It is not our intention to revisit the work of the many theories or theorists who have contributed to our understanding of early learning in this paper, but to acknowledge the origins of the ideas presented.

Contemporary perspectives recognise that children's learning and development occur in a range of socio-cultural environments (including school) that are constructed by culture, traditions, social and economic status, beliefs, and the behaviours and actions of adults. Children are also seen as contributing to and shaping these environments through their own personalities, thoughts and actions, as well as being shaped by them. Such a view acknowledges children as active participants or agents and recognises their resilience and competence (Corsaro, 2015). Corsaro's argument is framed within the context of the United Nations Convention on the Rights of the Child (United Nations, 1989) which suggests that children should be afforded opportunities to be agentic and self-determining. This means they need opportunities to express their views, make decisions and take actions that affect their own lives and/or the lives of others relative to their capacity.

The notion that children are active, not passive, learners who acquire knowledge by examining and exploring their environment is an enduring tenet that draws on the theories of philosophers such as Froebel and Rousseau. Continued research on the nature of children's active learning has determined that it is dynamic in nature and involves complex processes (Schulz, 2015), and that children have unique capabilities to represent their thinking and learning. Evidence of its complex nature has come from empirical studies in the area of science which demonstrate the type of active learning and thinking that young learners do. These studies show that young learners use a scientific approach. They "test hypotheses against data and make causal inferences; they learn from statistics and informal experimentation and from watching and listening to others" (Gopnik, 2012, p. 1623).

What this means, as Weisberg, Hirsh-Pasek, and Golinkoff (2013) suggest, is that young children learn best in "active, engaged, constructive and interactive environments" where the material they are learning is meaningful to them (p. 108). Within these environments, they "co-construct their learning intentions, learning strategies, and learning outcomes in culturally meaningful ways with peers and adults" (Nolan & Kilderry, 2010, p. 113). Much of children's learning is associated with play but Vygotsky (1978) saw the importance of the adult's role in supporting this play. When teachers use responsive pedagogical approaches in these environments, they mediate the kinds of informal, everyday knowledge that children construct which can be a foundation for the co-construction of more formal knowledge (Hedges & Cullen, 2012). Children's learning is seen to be further supported when they are asked probing questions that challenge their thinking and when they receive supportive feedback (Weisberg et al., 2013).

The following section presents a review of the research literature to identify what is considered important in learning and teaching in the early years.

3. Literature review

A selection of influential longitudinal studies in the research literature over the last 10 years has been examined in this section to identify the themes and messages that inform pedagogical principles, approaches and practice in early years' education today. These studies demonstrate international concern in balancing efforts to improve outcomes and address social disadvantage while facilitating the holistic development of young learners so that they have a strong foundation from which to become lifelong learners. The strength of large-scale longitudinal studies in offering insights into the successes and challenges of various pedagogies in early childhood education is that they provide a strong evidence base for understanding age-appropriate pedagogies for Queensland schools.

3.1 Cambridge Primary Review

A major independent review of the condition and future of primary education was undertaken in England between 2006 and 2010. The Cambridge Primary Review (Alexander, Doddington, Gray, Hargreaves, & Kershner, 2010) was based on evidence from 28 research surveys and 3,000 published sources. Within the report, the importance of early learning in laying the foundations for all later learning was emphasised, as was the importance of ensuring that children's needs and abilities

are catered for adequately in preschool and the early years of school. Whilst the volume of research evidence is too vast to report on adequately here, we have selected some of the pertinent messages from the research surveys.

For example, the research survey conducted by James and Pollard (2010) found that:

- Good early years' pedagogy combines direct teaching, instructive learning environments and sustained shared thinking to develop children's learning.
- Funds of knowledge are embedded in the cultures of homes and communities and can be used to support learning in schools.
- Children are active agents in learning.
- In addition, the research survey conducted by Goswami and Bryant (2010) found:
- Pretend play and the imagination are important for cognitive development, helping children to reflect upon and regulate their own cognitive behaviour. Pretending is more effective when carried out with other children and when scaffolded by adults.
- Learning in classrooms can be enhanced by developing metacognitive strategies, self-reflection and inhibitory control in children. These skills can be taught.
- Symbol systems like the alphabet and the number system require direct teaching.
- The cognitive prerequisites for reading and number depend on language development, perceptual development and spatial development, and can be enhanced by using linguistic rhymes and rhythm games.
- Learning is primarily a social activity. Social interaction and collaborative activity among children in class can provide valuable, complementary and distinctive opportunities for learning and conceptual development.
- The ways in which adults talk to children can influence learning, memory, understanding and the motivation to learn. Learning and memory benefit when the teacher adopts an elaborative conversational style, amplifying and evaluating what the child says. This elaboration helps children to make sense of temporal and causal aspects of their experiences.

These research findings, along with others included in the Cambridge Primary Review, reinforce the position that a range of age-appropriate pedagogies, including pretend play and direct teaching, is needed to facilitate young children's engagement, as well as their curriculum learning and holistic development. The findings also demonstrate the subtle ways teachers can enhance learning, memory, metacognition, and executive functioning of young learners, through a range of age-appropriate pedagogies, underpinned by sustained shared thinking between children and adults. However, a clear understanding of the purposes of various pedagogies is important. For example, while direct teaching may be useful for developing symbol system usage, pretend play is far more effective in developing cognition and self-regulation.

3.2 The Effective Provision of Pre-school Education (EPPE) project

The Effective Pre-school and Primary Education (EPPE) project was a major study of the longitudinal effects of pre-school provision for 3,000 young children in England (Sylva, Melhuish, Sammons, Siraj-Blatchford, & Taggart, 2011). The effects were later investigated at primary school entry (age 5), in Years 1 and 2 (age 6 and 7) and in Year 6 (age 11).

The main findings of the study were that high quality preschool experiences had positive effects on children's intellectual and social behavioural development up to age 11 (Sylva et al., 2011). The EPPE 3-11 project (Effective Pre-School and Primary Education 3-11) indicated that the influence of overall teacher quality is stronger than factors such as gender and family background on maths and reading outcomes. Characteristics of teacher quality were seen as relating to the richness of instructional methods, a positive classroom climate, productive use of instructional time, the use of feedback, teacher sensitivity to children, and teacher engagement. An organised classroom where there is a calm orderly climate was also seen as important (Sammons et al., 2008).

As part of the larger study, the Researching Effective Pedagogy in the Early Years (EPEY) project was undertaken to examine the characteristics of effective pedagogy that predict positive cognitive and social/behavioural development outcomes (Siraj-Blatchford, Sylva, Muttock, Gilden, & Bell, 2002). The study found that the most effective teachers:

- Engaged children in verbal interactions that showed sustained shared thinking;
- Showed a good understanding of the content of curriculum areas;
- Encouraged children to engage with cognitive challenge;
- Had a repertoire of pedagogical activity (including direct instruction) that they drew on as appropriate;
- Had clear behaviour and discipline policies, supported by facilitating children to talk through conflicts which benefited social skills;
- Differentiated the curriculum to match activities and level of challenge to the children's needs; and
- Showed an equal balance between child-initiated and adult-initiated activities.

These findings on effective teachers align closely with the key messages identified in the Cambridge Primary Review above and suggest that teachers need to draw upon a range of age-appropriate pedagogies in order to engage young children. Effective teachers cater for difference and balance adult- and child-initiated activities. Again, opportunities for social learning were recognised and the need to facilitate conflict resolution through talk was emphasised.

3.3 The Early Years Enriched Curriculum Evaluation project

The Enriched Curriculum (EC), a developmentally appropriate, play-based curriculum, was introduced in 2000 to the first two years of primary school in Northern Ireland to replace a traditional, formal approach. A study of the implementation of the EC involving 24 schools ran for 8 years.

In 2006, Walsh et al. reported on the quality of the learning experiences for 4-5-year-old children comparing play-based and formal, subject area oriented approaches to learning and teaching. A Quality Learning Instrument was used to assess the quality of the experiences. Nine quality

indicators were assessed: motivation, concentration, confidence, independence, physical well-being, multiple skill acquisition, higher-order thinking skills, social interaction and respect.

The findings indicated that the EC offered 4-5-year-old children a higher quality learning experience than the more traditional Year 1 curriculum. However, the findings also suggested the role of the teacher is pivotal in a play-based environment to ensure children experience high cognitive challenge and engage in effective thinking. Achieving a balance between play-based, practical and written tasks and a more equal distribution of time between child- and teacher-initiated activities was considered important for higher-order thinking, along with appropriate interaction in play-based activity on the part of the adults. The study also identified that "an appropriate learning environment for young children is one in which useful age-appropriate activities are available, interesting practical projects are carried out, teachers have high expectations of children, and children and adults work together as a team" (Walsh et al., 2006, p. 219). They advocated for a mix of pedagogies to suit curriculum content and topics. Further, Walsh, Sproule, McGuinness and Trew (2011) proposed a playful structure for early years' pedagogies. They suggest that playfulness should infuse all interactions between adults and children, including play-based and structured activities. Diamond and Lee (2011) agree, claiming that "a playful approach tends to reduce stress in the classroom; cultivate joy, pride, and self-confidence; and foster social bonding; all of which support efforts to improve executive function and academic achievement" (p. 963).

In 2014, McGuinness, Sproule, Bojke, Trew and Walsh reported on the effect over time on reading and mathematics outcomes for the first two cohorts of children who had experienced the EC in Years 1 and 2. They found that the introduction of the play-based EC had an immediate impact on reading and mathematics attainment with EC children significantly underperforming when compared with control groups in the first two years. This was attributed to the fact that no formal teaching of reading and arithmetic occurred in the EC classes in Years 1 and 2 whilst formal teaching occurred in the control groups.

By Year 4, as expected, the gap had closed with no discernible differences between the second EC cohort and its control group. However, significant differences remained between the first EC cohort and the control group. This difference was explained by the mismatch between Year 3 teachers' expectations and children's actual performance when the first cohort joined the Year 3 classes, whilst teachers were better prepared when the second cohort of children arrived. McGuinness et al. (2014) suggest that the process of change and the specifics of change contributed to the outcomes observed, with some teachers reporting feeling "deskilled" in the first year. However, all early years teachers expressed the conviction that they would "do it better" in subsequent years. McGuinness et al. expressed concern that when pedagogical changes are implemented, the new professional demands on teachers and the lead-in time to establish new approaches are often under estimated.

In Years 5-7 there was no discernible difference between each cohort and their control group. The second cohort slightly outperformed the first, with the effect more marked and statistically significant only in reading, which McGuinness et al. (2014) suggest was a bedding-down effect for the new

curriculum. However, they could not preclude that the difference may have been a random variation or teacher effect. As both EC cohorts matched the controls at Year 4, subsequent variations may not be associated with their early years' experiences.

This study raised some interesting points. First, even though there was no formal teaching of reading and arithmetic in Years 1 and 2, the two EC cohorts had "caught up" with their control groups by Year 4; nevertheless, there is strong impetus to continue the teaching of academic content in Prep. Second, it illustrates that a change in pedagogies in the early years has a flow-on effect for the following year levels that must be considered and factored in to the training, resources and support needed to implement change. Third, it highlights that new professional demands on teachers need to be supported and that lead-in time is required to establish new approaches.

3.4 Active Learning project

The Active Learning project (Martlew, Stephen, & Ellis, 2011) investigated the creation of active play-based learning environments in six Primary 1 classes in Scotland. Active learning was defined as "learning which engages and challenges children's thinking using real-life and imaginary situations. It takes full advantage of the opportunities presented by spontaneous and planned, purposeful play; investigating and exploring; events and life experiences; focused learning and teaching" (p. 73). The study was undertaken within a policy context that aimed at placing greater emphasis on active learning in the early years of schooling and was based on an understanding that children have agency and distinct preferences and are ready to learn. The push for active learning environments responds to research evidence that play develops children's content knowledge across the curriculum and enhances the development of social skills, competences and dispositions to learn (Wood & Attfield, 2005).

The findings indicated that despite teachers believing that active learning approaches promoted positive dispositions to learning and that they encouraged independence and confidence, some found it challenging to create an appropriate learning context. They found gathering evidence of children's learning (assessment) in such an environment challenging and had to find alternate approaches, such as using a narrative approach instead of performance indicators. Findings also suggest that there was little evidence of child-initiated engagement or peer interaction. The study concluded that additional resources and training are needed to support the demands of adopting an active learning approach.

The implementation of active learning in Primary 1 classes responded to evidence indicating that play enhances children's learning in academic curriculum areas as well as their social skills and dispositions. The study highlighted the challenges that teachers sometimes have in clarifying the purposes and structure of active learning when changing from a more formal approach. The minimal leadership opportunities for children (limited opportunities for agency) evident in the classrooms studied may indicate that teachers did not, in fact, enact an active learning approach effectively or use a range of age-appropriate pedagogies. Nonetheless, active learning environments are considered necessary in early years' research and a key lesson from this evaluation is the danger of a policy context requiring a pedagogical shift without sufficient attention to the support required for teachers to assure integrity in its implementation.

3.5 Child-initiated pedagogies

The study of child-initiated pedagogies conducted by Robertson, Kinos, Barbour, Pukk and Rosqvist (2015) was a longitudinal study undertaken in three countries: Finland, Estonia and England. It examined the process of co-constructing learning experiences between children, adults and the environment, especially the teacher's role in fostering places of participation. The study also documented children's views on how decisions were reached, what kinds of things were decided, and who decided them. Three themes emerged from the study: control, collaboration and experimentation. The findings suggest that children viewed themselves, and wanted to view themselves, as competent experts in their own settings and viewed teachers as more knowledgeable partners; they engaged in decision making in collaboration with peers and the teacher; and experimented with situations, pushing boundaries and accepted ways of behaviour and sharing the responsibility of maintaining control. The study concluded that children are skilful in sharing the responsibility of control with peers and adults.

Given that all of the studies of age-appropriate pedagogies discussed here highlight sustained shared thinking and child leadership, agency and/or initiation of activities, this study demonstrates the capacities of children to engage in such responsibilities and co-construct their learning. It emphasises the importance of the teacher's role in fostering participation for effective learning and maintaining a balance between child-initiated and adult-initiated activities.

3.6 The High/Scope Perry Preschool study

The study of the High/Scope Perry program commenced in the United States of America (USA) in 1962 and has spanned four decades. It compared 58 low-income, 3-4-year-old African-American children who participated in the High/Scope Perry program with 65 similar children who had no preschool education, in order to identify the short- and long-term effects of a high quality program (Schweinhart et al., 2005).

Like other programs in the USA such as the Chicago Child-Parent Center Project and Abecedarian, the High/Scope Perry program targets disadvantaged children. Experimental studies of these models over the long term have reported cognitive and academic achievement gains and long-term reductions in referrals for special education services, grade retention and school dropout as well as increases in adult educational attainment (Campbell, Ramey, Pungello, Sparling, & Miller-Johnson, 2002; Galinsky, 2006).

The High/Scope Perry program is an example of experiential learning. It considers children intentional learners, who learn best from activities that they plan, carry out, and review afterwards. The role of the adult is seen as introducing new ideas through adult-initiated small- and large-group activities; observing, supporting, and extending children's play; arranging interest areas in the learning environment; maintaining a daily routine that permits children to plan, carry out, and review their own activities; and joining in children's activities, asking appropriate questions that extend their plans and help them think about their activities. They add complex language to the discussion to

expand children's vocabulary and encourage them to make choices, solve problems, and engage in activities that contribute to their intellectual, social, and physical development. Adults also listen closely to children's plans and then actively work with them to extend their activities to challenging levels as appropriate.

Overall, this study demonstrates that children's agency, alongside effective input from adults to support and extend children's interests while engaging them in activities for intellectual, social and physical development, has long-term benefits for learners. Engagement and holistic development are facilitated through playful learning even where children's experiences prior to school may include limited resources. The longitudinal findings of the study demonstrated the weaknesses of direct instruction as a dominant pedagogy on children's long-term success and the value of experiential, playful learning approaches. Hirsh-Pasek and Golinkoff (2011) suggest that playful learning, not direct instruction, maximises children's ability to learn and to transfer what they have learned into practice.

3.7 Skills for social progress

A meta-analysis of research by the OECD (2015) has presented a compelling case for making the holistic development of children a priority. They developed a synthesis of empirical, longitudinal research from 11 countries to identify the effects of skills on a variety of socioeconomic outcomes and the "causal process of skill formation with past skills interacting with new learning investments" (p. 47). The countries involved were Australia, Belgium, Canada, Germany, Korea, New Zealand, Norway, Sweden, Switzerland, the UK and the USA. The types of studies included in the synthesis were wide-ranging: in Australia, for example, the Longitudinal Survey of Australian Children (LSAC) (a major study following the development of 10,000 children and families from all parts of Australia) and the Australian Temperament Project (ATP) (a longitudinal study following the development of Victorian children from birth to adulthood) were included.

The results identified the need for children to have a balanced set of cognitive, social and emotional skills. The OECD found that "the social and emotional skills that raise children's capacities to achieve goals, work effectively with others and manage their emotions are considered among the important drivers of school and lifetime success. The particular skills involved in these processes include perseverance, sociability and self-esteem" (p. 46). The report found that social and emotional skills play a particularly important role in improving health-related outcomes, reducing anti-social behaviour, and protecting individuals from being victimised by aggressive behaviours.

Whilst the body of research synthesised by the OECD identified that cognitive, social and emotional skills may develop independently, they were also found to influence each other as children progressively develop these skills. However, the impact of raising children's social and emotional skills was identified as having a much stronger impact than raising cognitive skills (Heckman, Humphries, Veramendi, & Urzua, 2014). Past levels of social and emotional skills were also found to play an important role in developing further cognitive skills. This means that "children who are confident, responsible and believe in their capacity to affect the future are more likely to achieve high academic standards than those who are already smart" (OECD, 2015, p. 74). Of particular note

was that in the research reviewed, past cognitive skills were found to have limited impact on future social and emotional skills.

The OECD maintains that these capacities are learned through warm and supportive relationships between parents, teachers and children, consistent and high quality learning environments, and learning experiences that are "sequenced, active, focused and explicit" (p. 130). They also suggest that intensive interactions between teachers and children that take the form of mentoring can support development. Programs designed to raise social and emotional skills in schools have also shown short-term positive results. These successful early childhood programs directly involve children and parents.

Children's holistic development should therefore be foregrounded in classroom programs. The long-term benefits of children's social and emotional skills as a foundation for cognitive development are apparent. Additionally, the relationships that children develop with adults are key to engaging effectively in high quality learning experiences.

3.8 Supportive relationships and active skill-building strengthen foundations of resilience

Support for a focus on children's holistic development has also come from the area of neuroscience. The National Scientific Council on the Developing Child (2007) demonstrated how the development of children's social, emotional, cognitive and physical skills and their brain architecture are interrelated and occur over time. These developments have been found to have a cumulative effect which means that the level of skill developed in childhood plays an important role in the further development of these skills later in life. An investment in the holistic development of these skills in the early years of schooling is seen to create a strong foundation for children's later success.

The executive functioning of the brain and children's development in the early years of schooling has been the focus of much research. Core executive functions are identified as cognitive flexibility, inhibition (self-control, self-regulation), and working memory, whilst more complex executive functions include problem solving, reasoning, and planning (Diamond & Lee, 2011). These executive functions have been found to play a critical role in the development of academic skills (Cartwright, 2012) and are considered a strong predictor of maths and reading competence throughout all school years (Gathercole, Pickering, Knight, & Stegmann, 2004). Considered necessary for formal learning (Hopkins, Green, & Brookes, 2013), they have been found to improve effectively through programs that have a focus on children's emotional, social and physical development (Diamond & Lee, 2011; Verburgh, Konigs, Scherder, & Oosterlaan, 2014).

A range of research studies has shown the particular benefits that physical exercise has on children's holistic development, and in particular, on aspects of executive function. For example, a meta-analysis of empirical studies on children (6-12 years), adolescents (13-17 years) and young adults (18-35 years) (Verburgh et al., 2014) found across the three groups studied, acute physical

exercise enhanced inhibitory and interference control, essential for regulation of behaviour and emotions. Another study by Becker, McClelland, Loprinzi, and Trost (2014) with Prep-aged children similarly demonstrated that active play is linked positively to self-regulatory skills that, in turn, predict academic success.

Neuroscientists, too, have demonstrated the benefits of physical exercise on brain function (Archer & Siraj, 2015). Findings from studies of brain function in youth indicate that exercise early in a person's life can contribute to the improvement of cognitive function during childhood and may improve their academic performance (Hillman, Erickson, & Kramer, 2008). Others (e.g., Goddard Blythe, 2011) argue that if a range of physical skills including balance, posture and coordination are secured in Prep, then the child is better equipped to cope with the demands of a formal classroom. Therefore physical exercise and activity are essential features of early years' classrooms.

Acknowledgement of the need for children to have supportive relationships was reported in a recent Harvard review of a decade of research studies on people's adaptive capacities (Center on the Developing Child, 2015). This report indicated that people who had a stable and committed relationship as a child with at least one adult were more likely to be resilient and do well in life. Such a relationship provides personalised responsiveness, scaffolding and protection and builds the child's capacities to plan, monitor and regulate behaviour, and adapt. This combination of supportive relationships, adaptive skill-building and positive experiences establishes the foundations of resilience – a positive, adaptive response in the face of adversity.

The Center on the Developing Child report (2015) provides extensive evidence that a composite of personal, relational and contextual factors promotes resilience. The Center argues that early childhood policies and programs need to focus on:

1. facilitating supportive adult-child relationships;
2. building a sense of self-efficacy and perceived control;
3. providing opportunities to strengthen adaptive skills and self-regulatory capacities; and
4. mobilizing sources of faith, hope, and cultural traditions. (p. 10)

In sum, supportive relationships and learning-related skills that include social, emotional, cognitive and physical skills assist children to adjust to the behavioural and academic demands they encounter at school.

3.9 The impact of pretend play on children's development

Lillard et al. (2013) undertook a meta-analysis of the literature on the impact of pretend play on children's development. First they conducted a scan of the literature in order to identify studies that make assertions about the benefits of pretend play.

They investigated three claims about pretend play arising from the studies. The first claim is that pretend play is crucial for children's healthy development; the second, that pretend play is one of many routes to positive development; and the third, that it often presents when important developments occur but does not cause them. The studies analysed claimed one of the following: that pretend play produces cognitive benefits, increases intelligence, enables problem solving, assists reasoning, leads to conversation, assists social cognition or theory of mind, improves social

skills, contributes to language development, assists in narrative development and comprehension, improves executive functions, and assists in regulating emotions.

The findings of the meta-analysis concluded that based on existing research, the causal account of the importance of pretend play is possible in the development of reasoning, language, narrative, and emotion regulation. It found no conclusive evidence that pretend play plays a crucial role in development, but that it is one of many routes to positive development and is often found to be present when positive developmental outcomes occur. Lillard et al. (2013) blamed weak research methods in many of the studies for the inability to provide conclusive evidence on the causal link between pretend play and children's development. Despite this, they argue that active, child-centred approaches are age appropriate and that adult-centred learning environments are less positive for children. They claim a hands-on, child-driven method, often referred to as playful learning (Hirsh-Pasek & Golinkoff, 2011), is the most positive means yet known to support young children's development.

3.10 Creative Little Scientists Project

The European Union project titled Creative Little Scientists (2011-2014) explored the teaching and learning of science and creativity in early years' education (3-8 years) across nine countries (Cremin, Glauert, Craft, Compton, & Stylianidou, 2015). These countries were Belgium, Finland, France, Germany, Greece, Malta, Portugal, Romania and the UK.

As part of the project, 218 episodes of learning and teaching were examined to understand the potential synergies between inquiry-based science and creativity-based approaches identified in the literature as play and exploration, motivation and affect, dialogue and collaboration, problem solving and agency, questioning and curiosity, reflection and reasoning, and teacher scaffolding and involvement.

The project was based on a range of empirical studies. For example, studies that showed playful hands-on experiences encourage children to make connections between science and their environment (Poddiakov, 2011); open-ended exploratory contexts foster both learning and creativity (Poddiakov, 2011); playful experiences nurture children's motivation to understand their world (Larsson & Halldén, 2010); fascination, wonder and interest spark curiosity and lead to the use of scientific inquiry to develop explanations of phenomena (Milne, 2010); the power of narrative to involve children imaginatively fosters their creativity in different domains (Cremin, Chappell, & Craft, 2013); dialogue is important to enable children to externalise, share and develop their thinking (Carlsen, 2008); there is an inverse relationship between the amount of direction from teacher materials and learner self-direction over the problem finding/solving process in science (Barrow, 2010); and engagement with problems fosters child agency, ownership of learning and the development of self-determination and control (Craft, McConnon, & Matthews, 2012).

The Creative Little Scientists research revealed that in playful, motivating and exploratory contexts, young children engage with resources, ask questions, collaborate and find and solve scientific

problems with the support of their teacher. They generate ideas and strategies individually and communally, engage in reasoning about these ideas and strategies, and produce explanations consistent with the available evidence. The study showed there was strong evidence of synergies between inquiry-based science and creativity-based approaches in both preschool and primary settings. The findings in this research align with empirical research reported by Gopnik (2012) that indicates young children test hypotheses against data and make causal inferences, and that they learn from statistics and informal experimentation and by listening to and watching others.

These research findings contribute to understanding the capacities of young children to engage actively in their own learning. Balancing child-initiated activities with those that are teacher led is more than a tokenistic homage to children's agency and democracy. Children's engagement in active learning that is creative and inquiry based both builds on their innate capacities and offers a strong basis for cognitive and academic learning.

3.11 Summary

Collectively, these 10 large-scale research studies reveal key messages about learning and teaching in the early years of school. These are:

1. A balanced repertoire of age-appropriate pedagogies is needed to ensure that educators are responsive to learners and fulfil teaching goals.
2. A balance is needed between holistic development and academic goals in order to give children a strong foundation for success at school and in later life.
3. A balance is needed between child-initiated and adult-initiated learning experiences in order to recognise children's agency and promote their capabilities.
4. Positive personal relationships amongst teachers and peers are needed to foster motivation to learn, social collaboration, engagement and enjoyment.
5. Playfulness should pervade learning and teaching interactions.
6. High quality verbal interactions are needed for sustained shared thinking in collaborative learning.
7. Adult leadership and scaffolding is needed for cognitive challenge and the development of higher-order thinking.
8. Opportunities for active learning are needed in real-life, imaginary, spontaneous and planned experiences.
9. A change in pedagogies in the early years has a flow-on effect for the following year levels that must be considered and factored in to the provision of training, resources and support.
10. Professional demands on teachers need to be supported and the lead-in time required to establish new approaches recognised.

As these international studies suggest, selecting and utilising a range of age-appropriate pedagogies is complex but essential, with important elements being taken into account in order to ensure teaching is responsive to learners and attends to holistic and academic goals. Luke (2013) stresses that there is no single effective strategy, approach or method of teaching, for this view ignores the range of children, cultures, communities, ages and developmental levels, subjects, skills and knowledges that teachers face every day.

4. Pedagogies, purposes, contexts and participants

In early years' education, goals are multiple and diverse. Some of these goals are holistic, focused on supporting children's cognitive, social, emotional and physical development, while others are more specifically aimed at helping children gain the skills and knowledge they need to participate in complex and challenging societies. Ensuring that children actively participate and engage in learning, have a positive experience of education, and develop an informed awareness of health are factors considered crucial for children's long-term wellbeing. Such approaches are based on the knowledge that children's physical, social, emotional and cognitive development are interrelated, necessary for optimal educational achievement, and inextricably linked to their socio-cultural contexts (Alexander et al., 2010). The goals for learning are therefore both general and specific, with some being short term while others require that educators adopt a longer-term perspective.

When considering the effectiveness of pedagogies, the diverse backgrounds of participants engaged in learning must also be considered, along with the diverse contexts within which this learning occurs. For example, research in the Netherlands found direct instruction used to support children's reading skills was more effective with children from disadvantaged backgrounds than middle class backgrounds where classroom practices are likely to align more closely with home (Snel, Terwel, Aarnoutse, & van Leeuwe, 2012). However, findings from an evaluation of the Cape York Aboriginal Australian Academy Initiative implementing direct instructional methods in primary schools at Coen, Hope Vale and Aurukun were inconclusive as to whether the initiative had an impact on student learning (Australian Council for Educational Research [ACER], 2013).

Of course, duration is an additional consideration, with pedagogical effectiveness also needing to take account of the full range of activities children are engaged in across their day, week and year of learning. For example, whilst many critics (e.g., Stipek, 2011) argue that direct instruction stifles motivation, precludes choice, inhibits agency and reduces opportunities to provide appropriate levels of challenge for children with varying interests and skills, these criticisms are mainly directed at those overarching approaches that adopt such pedagogies to the exclusion of others. However, when direct instruction is used with individuals or small groups, for limited periods of time and combined with other more agentic learning approaches, including those that are more open ended and child focused, many of these criticisms can be ameliorated. Similarly, whilst critics of free play suggest that it is insufficient as a learning approach (Hedges & Cullen, 2005), when used in combination with other more scaffolded pedagogies, free play can make a strong contribution to learning.

Clearly then, in any discussion of effective early years' pedagogies, consideration of participant, context, purpose and duration is needed. For this reason, there needs to be a variety of pedagogical approaches, each responding, as Luke (2013) suggests, to children, their cultures, and communities. Accordingly, Ang (2014) suggests there is a need for teachers to engage children in an empowering process where their diverse skills and abilities are recognised, and educators are able to explore alternative pedagogical strategies that support children's learning.

With this in mind, a review of recent research relating to the effectiveness of specific pedagogical approaches is offered. Our purpose in offering this review is not to set up a hierarchy of pedagogies, with one or two being identified as superior to others, but rather to identify a set of more general characteristics – characteristics that have been identified as a result of research within specific contexts and for specific purposes. To do this we will examine approaches that aim at enhancing both holistic and specific curriculum outcomes.

A key part of this discussion will be the role of the adult. This aspect is particularly significant here for some approaches and their effectiveness have been shown to vary considerably depending on the input of the teacher or other adults. For example, whilst there is considerable literature relating to "play-based" approaches, the level of adult involvement in these approaches can vary markedly from almost none, to quite explicit engagement. As such, any discussion relating to the effectiveness of specific pedagogies must also include an examination of how this pedagogical approach has been enacted within the study itself. It is not possible therefore to look at studies of the effectiveness of pretend play, for example, without also considering the conditions within which this play was enacted.

The examination begins with aspects of children's holistic development, followed by research relating to the effectiveness of pedagogies applied to some curriculum areas including language, literacy, numeracy, science, history and geography, and the Arts.

4.1 Holistic development

Within this paper we have used the term holistic development to describe those aspects of young children's learning that are non-discipline specific and include social, emotional, cognitive, physical, linguistic, spiritual and creative dimensions. Children's holistic development is the foundation of the national early years learning framework: *Belonging Being and Becoming* (DEEWR, 2009) which suggests its interwoven and interrelated nature should be considered in curriculum decision making from birth to five years and through the transition to the early years of school.

A range of pedagogies that support children's holistic development is appropriate for young learners. These emphasise the value of play and playful structures in encouraging children's broader skill development and inform the nature of more structured learning that maintains children's agency, activity, and opportunities for language and cognitive engagement. To sustain use of such pedagogies in the early years of school provides continuity in the learning opportunities afforded young children as they transition from kindergarten to school.

4.2 Curriculum learning

Within this section, we outline what the research literature offers in relation to age-appropriate pedagogies for the teaching of curriculum areas. Whilst not all areas are addressed here, the following have been included: literacy, numeracy, science, history and geography and the Arts. In offering these curriculum areas as discrete, we are not arguing that this is the most age-appropriate organisation of curriculum learning. Rather, they are organised in this manner for this is how they are presented within the literature. Our clear preference would be for educators to adopt a connected and authentic curriculum approach that responds to children's interests and supports

meaning-making through engagement in real-life contexts. In addition, we do not claim here that all pedagogical approaches suitable for developing children's learning across these curriculum areas have been comprehensively addressed. Instead, we again offer a snapshot of some relevant aspects of the literature.

4.2.1 Language and literacy

Underpinning literacy development is a strong foundation in oral language. Haseman and O'Toole (1990) have argued that language is power, whilst O'Toole (1991) provocatively describes oracy as the "forgotten basic". Since the 1990s, the situation in relation to children's opportunities to engage in quality classroom talk have been further eroded to make way for a stronger focus on written literacy and numeracy.

Alexander's important work in this area includes a focus on dialogic teaching. His view (2012) is that the teaching of oral language must be an active process, with reading and writing being richly interwoven. He argues that teachers do not support all aspects of children's oral language, which includes language used for thinking, learning, communicating, democratic engagement, teaching and assessing. He suggests (p. 14) that educators and systems need to focus on the language environment of the classroom as a whole, with restoring the balance between teacher talk and children's opportunities for talk being critical.

O'Toole and Stinson (2013, p. 162) have also considered the importance of oral language, identifying four dimensions of oracy: functional, dialogic, linguistic and paralinguistic. They argue that these aspects are present in almost any complex human interaction and that "managing them, rather than being managed by them" (p. 165) is the key to agency. In their work they specifically identified dramatic pedagogies as being of key significance, suggesting that drama activates language learning through its use of role and dramatic context, the opportunities it provides for targeted linguistic practice, and its dialogical nature that encourages children's talk.

In recent work aimed at identifying the value of pretend play as a means of supporting literacy development, Roskos and Christie (2013) completed a review of 56 studies spanning the period 1979 – 2012. As a result, they suggest that play is an important context for developing literacy skills and for literacy behaviour to occur. Not surprisingly, they note that two features of the play environment that "increase the incidence of goal directed literacy behaviours" (p. 94) are those where the play environment has been enriched through the provision of literacy-related resources and those where adult facilitation is active. In addition, they suggest that in those studies where creative drama techniques such as puppet play, story drama and re-enactment were employed, there was an increase in story recall and comprehension – two important prerequisites for literacy. However, like Lillard et al. (2013), they believe that further research is needed in order to identify more closely those characteristics of play that work best to support literacy.

In relation to the adult's role as a contributor to play, Fleer's (2015) work is useful. She argues (p. 12) that by operating within play, teachers can offer more effective support than is achieved when

they attempt to "smuggle in content" or "bolt a learning goal" onto an existing play event. Hakkarainen, Bredikyte, Jakkula, and Munter's (2013) work extends this understanding by introducing several key characteristics for supporting literacy through play, including the need for adults to introduce new characters, tensions and contexts in order to "present and model higher forms of play" (p. 216).

Allied to any discussion of literacy development should be the importance of building children's narrative competence (Reese, Suggate, Long, & Schaughency, 2010). Narrative competence (Bruner, 1986) includes two main dimensions: narrative production and narrative comprehension (Baumer, Ferholt, & Lecusay, 2005). These are both critical to children's literacy learning, with narrative production being traditionally associated with writing, whilst narrative comprehension supports reading. How these skills are developed, however, is the current focus.

Pretend play has been consistently identified within the literature (e.g., Nicolopoulou & Ilgaz, 2013) as a major pedagogical approach that supports these competencies, including within Lillard et al.'s (2013) generally quite critical meta-analysis of how play contributes to children's development. In the literature, the value of both projected and personal pretend play (Slade, 1958) is highlighted. Projected pretend play sees children – either individually or with others – create dramatic worlds with objects ranging from Lego blocks to self-made plasticine figurines, with these being transformed to create active and spontaneously generated narratives. By contrast, personal pretend play is an embodied form where children themselves enact roles and situations. Recent work across these two areas suggests that adult support can be particularly important in extending the value of these forms of play as vehicles for developing narrative competence (Baumer et al., 2005; Dunn & Stinson, 2011).

Other studies have focused on pedagogical approaches relating specifically to the teaching of writing. In this regard, play-based or playful pedagogies have been increasingly marginalised in favour of approaches characterised by direct and explicit instruction. One highly relevant study, conducted in a Queensland Prep classroom (Harden, 2013), attempted to combine the explicit, sequential and phonological teaching of literacy skills with play and the application of dramatic pedagogies. Harden's approach is significant in terms of the philosophy adopted within this paper, for it highlights the value of adopting a range of pedagogical approaches. A summary of her findings (Dunn, Harden, & Marino, 2013) suggests that across the one-year period of the research, the children became confident, engaged, motivated and productive writers, achieving useful understanding of narrative, role and audience. Harden argues that the contexts created in the drama and play sequences "became the conduit not only of literary practices, but also of dispositions integral to the roles which accompany that practice" (p. 250); one of the key enablers was the phonemic awareness they had developed through explicit teaching.

Identifying the most appropriate pedagogical approaches for supporting children's ability to read is even more challenging, with de Haan (2005, p. 42) offering the view that there are two main approaches – the "direct influence of print model" and the "communicative needs model". According to de Haan, decoding competency is emphasised in the former, while the latter model emphasises the importance of language acquisition. In this respect pretend play has generally been viewed as being of significant benefit; however, as noted above, there is growing awareness that in order for its

benefits to be maximised, adult scaffolding and involvement is essential. De Haan argues therefore that the benefits of pretend play should not be "left to chance, but should involve deliberate efforts to enhance children's competencies" (p. 50). Of course, like Lillard et al.'s (2013) concerns about free play, this statement is not intended as an invitation for educators to replace pretend play with direct instruction, but rather to explore pedagogical approaches that make use of some aspects of explicit teaching, together with other more playful and creative approaches to supplement it.

Jones, Clark and Reutzel (2013) clarify this point, explaining that alphabet knowledge is enhanced by explicit teaching focused on the letter's name, sound and symbol; however, this instruction should be brief, recognising that the purpose of this learning is for reading, writing and meaningful literacy learning. For this reason, many in the field (e.g., Luke, Dooley, & Woods, 2011) argue that basic skills acquisition is necessary but not sufficient for sustained achievement.

4.2.1 Numeracy

Prior to school, young children possess significant, if naïve, mathematical knowledge and are capable of thinking mathematically (Hachey, 2013). Tucker (2010) argues that educators need to support children to make meaningful connections between their knowledge and new mathematical concepts experientially. This learning is facilitated through daily activities in which mathematical language and symbols are modelled (p. 9).

As outlined clearly in the studies examined in section 3, play is an age-appropriate early years' pedagogy. Tucker (2010) applies play in the development of mathematics understandings in the early years, identifying benefits and important considerations for playful learning. She argues that through play, children are able to "perceive that maths can be useful, enjoyable, sociable, cooperative and is a significant aspect of the real world" (p. 8). Again, a balance of educator- and child-initiated play is deemed desirable. The major benefits, however, of quality play are that children make meaningful connections not only between real-world experiences and mathematical understandings, but also between the concepts that are fundamental to mathematical activity (p. 9). Tucker reinforces that play contexts offer children opportunities to practise and develop understandings of mathematical language and symbols.

Although some basic skill development might be effectively achieved through direct or explicit instruction, Fisher, Hirsh-Pasek, Newcombe and Golinkoff (2013) argue that deeper understandings are developed when children are engaged in guided play. Their study compared pedagogical approaches for teaching children about geometric shape. They found that guided play that also involved dialogic inquiry best supported deep conceptual understanding. These authors found that through free play alone, some children missed key concepts, while didactic instruction resulted in children learning aspects of the shape but failing to make deeper connections, leading to errors in application.

4.2.3 Science

Children have a natural curiosity about the world around them and are keen to investigate their environments (Jirout & Zimmerman, 2015). Early years' pedagogical practices which focus on fostering flexible and innovative learning through exploratory and investigative engagement are age appropriate in their responsiveness to young children's capabilities and interests.

Preschoolers are "natural scientists in action" (Gopnik, 2012, p. 1627).They can test hypotheses against data and revise them using probabilistic evidence. They are capable of making wide-ranging predictions as a result of the abstract, structured, coherent and causal representations of the world around them which they have developed (Gopnik, 2012). Through exploratory play they are able to design spontaneous experiments to select and design actions to effectively isolate variables. They have the ability to distinguish between ambiguous and unambiguous evidence as well as informative and uninformative interventions (Cook, Goodman, & Schulz, 2011). It is vital that children are given the opportunity to utilise these skills.

Nayfeld, Brenneman, and Gelman (2011) have explored pedagogical structures appropriate for science learning in the early years. Their work, based on observation followed by intervention, highlights the fact that learning in science does not occur simply through the provision of a space designated for science or through the provision of interesting scientific stimulus materials. They argue that "the mere presence of science materials ensures neither independent exploration of them nor resulting learning from them" (p. 985). Their study determined that active participation and planning by educators was needed to drive engagement with science learning. Part of this participation relates to the modelling of vocabulary, whilst Nayfeld et al. also argue that learning is supported more effectively if autonomous exploration is preceded by teacher-led instruction. Of course, their argument is not that teacher-led instruction should replace exploration or inquiry models, but rather that the teacher's role is to promote and engage.

4.2.4 History and Geography

Age-appropriate pedagogies are also reflected in literature on early childhood learning in history and geography. The potential to engage children actively in learning about their world, including spatial concepts in mapping, temporal concepts around ancestry and heritage, and awareness of race, diversity and democracy, is evident (Krogh & Moorhouse, 2014).

The social routines of the classroom offer occasions to enact democratic and anti-bias values and take advantage of opportunities to expand on children's awareness of cultures, languages, people and places (Krogh & Moorhouse, 2014, pp. 236-237). Learning in the local environment offers children immediate and relevant contexts in which to develop their geographical knowledge. However, beyond the local environment, young children are able to draw on broader knowledge about the world around them (Palmer, Suggate, & Matthews, 1996, in Catling, 2006). Responding to children's curiosity about the real world provides rich potential for inquiry-based learning which Green, Reitano, and Dixon (2010) define as "… a way of learning and teaching that allows the natural curiosities of students to engage in thinking that is logical, rational, and sustainable" (p. 309).

Learning about other peoples and times can also be achieved in playful participation in the Arts and stories using artefacts and props with which children can actively interact. Saracho (2012) suggests

the use of recreations of the real-world contexts in which children might imaginatively engage in socio-dramatic play that is either temporary or extended, but responsive to children's interests.

Similarly, in playful learning, children have capacities to represent and symbolise geographic information using "representational surrogates" (toys and artefacts) to indicate places and environmental features. They are able to demonstrate their learning about environment, place and spatial concepts in their early learning (Catling, 2006). These capabilities offer opportunities for responsive, active, hands-on, play-based inquiry to engage with curriculum content. Age-appropriate pedagogies in the early years are those responsive to the capabilities of young learners.

4.2.5 The Arts

In recent work, Dunn and Wright (2015) identify the key characteristics of quality Arts education in the early years of schooling. These characteristics include meaning making through use of the full range of semiotic signs; embodied symbol making; empathy; and the centrality of emotion as an aspect of aesthetic experience. These latter two characteristics demonstrate the strong links between Arts education and social and emotional development, with Arts education being viewed as a vehicle for children to share meanings about their world. Within this work, Dunn and Wright also indicate that these qualities are only made possible within a classroom context when appropriate, creative, responsive and child-focussed pedagogies are employed, and they offer a set of principles to underpin these: a willingness to embrace the interconnectedness of sign usage; recognition of the importance of collaboration, including partnerships between teachers and children; the application of pedagogical approaches that are dialogic; an acknowledgement of the significance of narrative; and the careful documentation of learning.

The characteristics listed here in relation to the Arts provide a useful link to the section that follows, for many of the characteristics of quality pedagogies identified here align with those outlined in relation to learning in other curriculum areas, with features such as playfulness, dialogic learning, narrative, explicit instruction in appropriate quantities, collaboration and partnerships between learners and educators all being identified as key characteristics of quality early years' pedagogies more broadly.

5. Characteristics of age-appropriate pedagogies

The preceding sections have outlined the findings of key local and international studies, along with meta-analysis work relating to pedagogies in the early years. Across these sections, three critical elements and 10 key messages were identified. These principles and messages make it apparent that age-appropriate pedagogies cannot be prescribed and no recipe exists for their application within early years' classrooms. The possibilities for innovative teachers to create learning experiences informed by their understanding of pedagogies are almost endless. What is needed, however, is a set of characteristics to guide the selection and development of these learning experiences. These characteristics do not relate to every learner, learning context or desired outcome, nor do they all need to be present within any given learning experience. Instead, they

represent a set of desirable qualities that educators can consider when attempting to work with children and colleagues to be responsive to the individual child, context and purpose of learning. This approach ensures that hierarchies are avoided, whilst continuums of practice are also eschewed.

The characteristics of age-appropriate pedagogies should be:

Active – requiring physical and embodied engagement across all areas of learning. Whether this is indoors or outdoors, activity is essential in order to activate children's full potential. Their focus, concentration, motivation and self-regulation are enhanced through moving, doing, and interacting within a range of learning environments.

Agentic – ensuring that children have voice in their learning. Their ideas and interests initiate, support and extend learning possibilities in order to build on their real-world understandings and experiences.

Collaborative – being social and co-constructed. Children and educators work together to identify ways of learning and understanding through sustained shared thinking and action.

Creative -- inviting children to consider "What if?" They encourage investigation, inquiry and artistry to explore new possibilities and ways of thinking.

Explicit – making conscious for both learner and educator the relationships between the learning purpose and processes employed and the skills and understandings these processes support.

Language rich and dialogic – ensuring that learning occurs in environments where rich language is modelled and employed by both children and educators. Meaningful dialogues between children, as well as between children and educators, are created to support thinking, learning, engagement and imagination.

Learner focused – recognising that all children learn in different ways and that learning is a highly individual process. They also acknowledge differences in children's physical, intellectual, cultural, social and personal experiences and perspectives.

Narrative – thus acknowledging the important role that personal, written, oral and digital stories play in all our lives. They support both the production and comprehension of narratives through active processes, especially play.

Playful – encouraging children to make connections through imagination and creativity to explore alternate worlds and ways of thinking. These worlds, not bounded by reality, offer the freedom children need to innovate and enact new possibilities.

Responsive – incorporating a willingness to be flexible, to ensure that learning is always child, context, content and discipline appropriate. To achieve this, educators will balance opportunities for structure and spontaneity, open-ended and specific tasks, and child-led and educator-led learning.

Scaffolded – including such actions as modelling, encouraging, questioning, adding challenges, and giving feedback, provide the support needed to extend children's existing capabilities. Effective scaffolding by both educators and other children provides active structures to support new learning; it is then progressively withdrawn as learners gain increasing mastery.

The teacher's role in guiding and facilitating learning experiences is critical and needs careful consideration. It involves "deliberate, purposeful and thoughtful" decision making and actions (Australian Government, 2009, p. 15) on the part of the teacher to promote children's innate drive for independent learning (Leggett & Ford, 2013). The teacher's role changes in different pedagogical approaches as the balance between planned and spontaneous, as well as between adult-guided and child-initiated learning experiences, shifts. It is also the teacher's responsibility to teach children about their roles in different pedagogies in order to co-construct learning and scaffold their involvement in a balance of adult-guided and child-initiated learning experiences.

In addition, the framework presented in Figure 1, adapted from the work of Fisher (2009), highlights some of the considerations that might influence the selection of these characteristics. This framework, which has four quadrants, suggests that learning in the early years needs to be balanced. It highlights our view that extended periods of classroom activity in any one quadrant of the framework would not provide children with the pedagogical support the research suggests is necessary. We should note here, however, that the term balance does not necessarily mean that equal time must be spent in each quadrant, for as we have remarked previously, pedagogies need to be responsive to the needs of individuals.

We present this framework for teachers to guide their personal reflections on the learning and teaching approaches and practices in their classrooms and to consider whether the balance needed between opportunities for planned and spontaneous learning, and adult-initiated and driven and child-initiated and driven learning experiences, is provided in their program. By so doing, teachers can identify where they need to expand their repertoire of pedagogies to ensure children are engaged in age-appropriate active learning experiences.
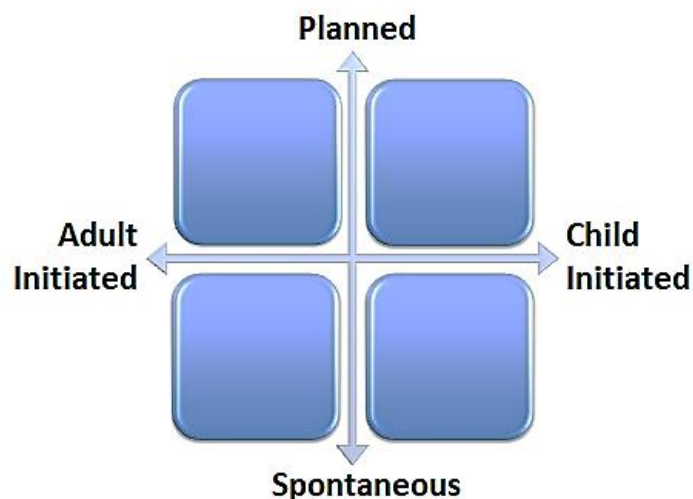

Figure 1. A framework to guide teacher reflection on the use of a balance of pedagogical approaches that respond to children. (Adapted from Fisher, K., 2009, *Exploring Informal Learning in Early Childhood*.)

6. Summary

From our analysis of the select research literature pertaining to age-appropriate pedagogies, we have distilled three critical elements to be incorporated into a school's pedagogical framework in order to ensure that the variety of contextual, instructional and developmental interpersonal factors that impact on learning in the early years are considered. These elements are that effective pedagogies need to be learner centred, involve the scaffolding of learning, and actively engage children in learning.

Also drawn from the literature are 10 key messages that need to be taken into account when considering age-appropriate pedagogies to ensure that teaching both responds to learners and attends to holistic and curriculum goals. The key messages are:

1. A balanced repertoire of age-appropriate pedagogies is needed to ensure that educators are responsive to learners and fulfil teaching goals.
2. A balance is needed between holistic development and academic goals in order to give children a strong foundation for success at school and in later life.
3. A balance is needed between child-initiated and adult-initiated learning experiences in order to recognise children's agency and promote their capabilities.
4. Positive personal relationships amongst teachers and peers are needed to foster motivation to learn, social collaboration, engagement and enjoyment.
5. Playfulness should pervade learning and teaching interactions.
6. High quality verbal interactions are needed for sustained shared thinking in collaborative learning.
7. Adult leadership and scaffolding is needed for cognitive challenge and the development of higher-order thinking.
8. Opportunities for active learning are needed in real-life, imaginary, spontaneous and planned experiences.
9. A change in pedagogies in the early years has a flow-on effect for the following year levels that must be considered and factored in to the provision of training, resources and support.
10. Professional demands on teachers need to be supported and the lead-in time required to establish new approaches recognised.

It is acknowledged that selecting and utilising age-appropriate pedagogies that respond to the range of children, cultures, communities, ages and developmental levels, subjects, skills and knowledges that teachers face every day is complex but essential. Therefore we present the following set of characteristics inherent in age-appropriate pedagogies drawn from the literature to guide teachers. Age-appropriate pedagogies are considered: *active, agentic, collaborative, creative, explicit, language rich* and *dialogic, learner-focused, narrative, playful, responsive* and *scaffolded*. We remind readers that these characteristics do not necessarily relate to every learner, learning context or desired outcome, nor do they all need to be present within any given learning experience. Instead, they represent a set of desirable qualities that educators can consider when attempting to work with children and colleagues as they respond to the individual child, context and purpose of learning.

To further assist teachers, we offer a framework to guide their reflection and inform their thinking about the balance needed between planned and spontaneous learning; adult-initiated and driven; and child-initiated and driven learning opportunities provided in their programs. We suggest that extended periods of classroom activity in any one quadrant of the framework will not provide children with the pedagogical support the research suggests is necessary. Using the framework will assist teachers to identify where they need to expand their repertoire of pedagogies to ensure children are engaged in age-appropriate active learning experiences.

In sum, the research literature is very clear that age-appropriate pedagogies are necessary in the early years of schooling to engage young learners, achieve effective learning outcomes, and set children up for long-term success.

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