

Developing a Provincial Early Childhood Learning Strategy

Literature Review



Early Childhood Learning Division,
Department of Education

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- Department of Human Resources, Labour and Employment
- Department of Labrador and Aboriginal Affairs



Preamble

Recognition of the importance of the early years has been evident at the international, national and provincial levels. Interest in the value of supporting early childhood development and learning in a systematic way has been heightened with the awareness of the findings of brain research and of longitudinal studies which show a significant return on investment in early learning. Investing in the early years is for the public good and has received support from various sectors, including education, health, business and justice.

Background

The Government of Newfoundland and Labrador has made a commitment to develop a provincial strategy for early childhood learning. This is reflected in Blue Book commitments and is consistent with goals and objectives outlined in other provincial initiatives such as the Poverty Reduction Strategy, Northern Strategic Plan, the Provincial Wellness Plan, and government's commitment to develop a 10 Year Early learning and Child Care Strategy. Other initiatives that complement this commitment include National Child Benefit (NCB), Early Child Development (ECD), Early Learning and Child Care multilateral framework, Early Learning and Child Care Plan (2006-11) and enhancements through the Child Care Spaces Initiative (CCSI).

There are two Blue Book commitments that are linked, but have separate scopes: the early childhood learning strategy is directly related to learning in the early years whereas government's commitment for a 10 Year Early Learning and Child Care Strategy relates to developing an infrastructure, policies, and standards to support a strong regulated early learning and child care system. The focus of the early childhood learning strategy is to coordinate an inter-departmental approach that will support best practices in early childhood learning for children birth to age six years.

The Department of Education is the identified lead for the early childhood learning strategy on behalf of government and partner departments who are members of the Ministerial Council: Department of Health and Community Services; Department of Child, Youth and Family Services; Department of Human Resources, Labour and Employment; and Department of Labrador and Aboriginal Affairs. Each of these departments has either direct key responsibilities for policy, programs and services for children birth to age six years or supports early childhood learning through departmental led initiatives. Partner departments will be involved in the development, implementation and evaluation of the early childhood learning strategy. For further information on government programs and services, view the government home page at <http://www.gov.nl.ca>.

Do you know?

“Learning in the first five years of childhood has critical implications for well-being and later success in school, at work, and in the community—more so than learning in any other stage of life.”

(Canadian Council on Learning, 2010, p.4)



The Government recognizes the need to enhance early childhood learning opportunities for children birth to age six years and their families. A provincial early childhood learning strategy is being developed as a means to provide young children and their families with community based, universal and accessible early learning opportunities. In broad terms, this strategy describes the vision, mission, principles, and government’s commitment to early childhood learning for Newfoundland and Labrador. The implementation of the strategy will allow families with children birth to age six years to avail of programs and services designed to promote early learning that will support children in their transition to school and continue their learning. Development of this provincial early childhood learning strategy will be grounded in evidence-based knowledge garnered from the latest research on early childhood learning and development.

The Minister of Education is responsible for all aspects of the K-12 and post-secondary education systems in the province. In 2005, this role was broadened to include learning in the early years before the age of five. The Division of Early Childhood Learning, Department of Education was established in 2005 to provide strategic direction to the initiatives in the area of early childhood learning. It also provides support to the Ministerial Council on Early Childhood Learning that is chaired by the Minister of Education, and includes Ministers of Health and Community Services; Child Youth and Family Services; Human Resources, Labour and Employment; and Labrador and Aboriginal Affairs.

As a means to inform the development of a provincial early childhood learning strategy, research via a literature review was undertaken by the Division of Early Childhood Learning in consultation with the Division of Evaluation and Research, Department of Education. This document comprises the detailed literature review. Information contained herein is intended to inform the development of a provincial early childhood learning strategy in consultation with other government partners and key stakeholders.

Methodology

Research via a literature review was undertaken by the Division of Early Childhood Learning in consultation with the Division of Evaluation and Research, Department of Education between September and November 2009 and between May and September 2010. A key word search included the following key words and phrases:

- “early childhood learning”
- “early neurological/brain development”
- “predictors of early learning”
- “social-emotional development”
- “self-regulation”
- “attachment”
- “role of parents”

- “early language development”
- “early literacy development”
- “early mathematical development”
- “developmentally appropriate practice (DAP)”
- “play”
- “play based learning”
- “human capital”
- “human development”
- “full day Kindergarten”
- “full-day Kindergarten”
- “socio-economic factors”
- “early childhood learning indicators”
- “Vygotsky”
- “scaffolding”
- “measuring early development and learning”

Databases searched include, but are not limited to:

- Canadian Council on Learning
- Canadian Education Council
- Canadian Language and Literacy Research Network (CLLRNet)
- Centre of Excellence for Early Child Development (CEECD)
- Centre on the Developing Child Harvard University
- Child Encyclopedia
- Canadian Child Care Federation
- Children’s Advocate
- Council for Early Child Development (CEED)
- Cultivating Connections: Global Perspectives and Practices in Family Literacy
- Developing Child Harvard Education
- Early Childhood News
- Early Childhood Research and Practice (ECRP)
- Education.com Bringing Learning to Life
- Encyclopedia of Language and Literacy Development
- ERIC digest
- Family Literacy
- Foundations for Literacy
- Foundations for Numeracy
- Handbook of Language and Literacy Development
- Language and Literacy from Birth for Life
- Literacy Encyclopedia
- National Association for the Education of Young Children (NAEYC)
- National Center for Children in Poverty (NCCP)
- National Institute for Early Childhood Research (NIEER)

- National Council of Teachers of Mathematics (NCTM)
- Northern Illinois University (NIU)
- Science Daily
- Science of Early Child Development
- Society for Research in Child Development
- Zero to Three

Highlights

There is a vast amount of research linking early learning opportunities to children's long term developmental outcomes as well as health, employment and well-being throughout the life course. Research by leading economists around the world has linked investment in early childhood development with economic prosperity, productivity and competitiveness for both the individual and society.

Research highlights include the following:

Role of Parents

Parents are a child's first teacher and they play an important role in their child's learning and development. Children who receive responsive and consistent care giving early in life develop secure attachments to their parents/caregiver, which helps with their growth and learning.

Neurological Development

Research findings conducted over the past three decades have led to an understanding of the rapid growth of the brain in the early years and how stimulation acts as a catalyst for that growth. In *The Early Years Study* (1999) and *The Early Years Study 2: Putting Science into Action* (2007) Dr. Fraser Mustard of the Council for Early Child Development (CECD) and others have established that the experiences in the early years 1) shape the architecture of the brain and 2) set the developmental trajectories that influence lifelong learning, behaviour, and health for individuals.

Predictors of Optimal Early Learning

The culmination of research findings has identified four primary areas of early childhood development that impact on future learning, success in school and life. They are:

- social-emotional development
- self-regulation
- oral language and early literacy development
- early mathematical development.

Also established in the research are:



Do you know?

Parents are a child's first and most important teacher.

- the importance of play as a means to learning
- the importance of early learning programs being developmentally appropriate
- the important role parents play in the early learning of their children
- investing in the early years generates over time benefits to the individual, government, and society
- the benefits of full-day Kindergarten

Literature Review - Research Findings

Role of Parents in Early Childhood Learning

In a report for the World Health Organization's Commission on the Social Determinants of Health, Siddiqi, Irwin, & Hertzman (2007) name the family environment as the primary source for children's experiences and contact with the larger community. A home environment that facilitates sensory stimulation, social interaction, language development and physical activity enhances healthy development and learning for young children (CECD, 2007; Beach and Friendly, 2007; Bredekamp and Copple, 1997).

Interactions between parents and their children play a crucial role in their children's social, emotional and cognitive development. Parent-child relationships and parenting practices (ways in which parents relate to their children) are strong influences on short-term and long-term development and learning (Sylva et al, 2004). Landry (2008) contends that children's development of cognitive and social skills needed for later success in school may be best supported by responsive parenting, a style characterized by affection, warmth and being responsive to a young child's signals, needs, and interests. Shonkoff & Phillips (2000) reported that parental sensitivity, responsiveness, and consistency are associated with positive child outcomes.

Landry, Smith, & Swank (2006) conducted an experimental study to examine whether mothers' responsive behaviours could be facilitated and whether such behaviours would boost young children's learning. A total of 264 mother-infant pairs participated in the ten-week experiment. Mothers, randomly assigned to an experimental group, were trained by facilitators during home visits to implement playing and learning strategies shown to help improve infant development. Mothers in the comparison group received the same number of home visits, but were not trained in the playing and learning strategies. Four aspects of responsive parental behaviour were evaluated: active response to infant's attempt to communicate, emotional-affective support, support for infant attention, and language input supporting developmental need. The results of the study revealed that all the mothers who had received the training were more attentive and warm to their infants. Infants whose mothers had received the training demonstrated significantly higher increases in their communication and social behaviours. The researchers concluded that the mothers who had

received the training showed improvements in their own behaviour and caused change to their infants' behaviour.

Schweinhart (2008) examined the effectiveness of three longitudinal studies, the Perry Preschool Project, the Abecedarian Project, and the Chicago Child-Parent Centers Study. The Perry Preschool Project operated from 1962 to 1965 in Ypsilanti, Michigan, and consisted of 2.5 hours of center-based preschool each morning for five days a week for children three and four years old living in low income families. It also included weekly 1.5 hour in-home visits by program teachers and monthly parent meetings. Children (N=123) were randomly assigned to program or no-program control groups. The Abecedarian project provided free, full-day educational childcare to 111 children from infancy to age five in Chapel Hill, North Carolina from 1972-1985. Infants were randomly assigned to either the early educational intervention group or the control group. The Chicago Child-Parent Centers Study, a quasi-experimental design based on identification of existing groups of children, was a center-based early intervention that provided comprehensive educational and family-support services to children aged three to nine in low income families. Schweinhart (2008), in examining the effectiveness of the three studies, points out that work done with parents to teach them about child development and the types of early learning activities they could do at home with their children was one of the five ingredients that stands out as definitive in enhancing child development outcomes.

Willms & Chao (2002) found that parenting practices have important effects on a child's social and cognitive outcomes. In their study, the authors asked parents of 19,000 children between the ages of two and eleven years 25 questions pertaining to parental practices. Strong positive effects on outcomes were associated with positive parenting practices, in particular the effect of responsive parenting. Holding, rocking, talking, singing, and playing with a child are all positive parental practices that facilitate early childhood learning and development. Based on the large representative sample of Canadian families used, the researchers found that both positive and negative parenting practices occur in families of all socio-economic levels. These results highlight the need for early learning opportunities to be universal as positive parenting practices is important for all families. Steven Barnett (2010), Co-director of The National Institute for Early Education Research (NIEER) points out that designing and providing additional programs and resources to children in families below an arbitrary income cutoff as a means to reducing the achievement gap ignore the fact that children and families move in and out of different income levels. Barnett insists that programs and services that are universal in nature minimize the risk of moving children in and out of programs and services that serve children whose families who may have a short-term reduction in economic resources.

The longitudinal study Effective Provision of Pre-school Education (EPPE) funded by the British government and conducted by Sylva et al (2009) followed the progress of 3000 children ages three to seven years. The study was designed to examine the effects of pre-school education and care on a large

Do you know?

Four primary areas of early childhood development that impact on future learning, success in school and life are: social-emotional development, self-regulation, language and early literacy development, and mathematical development.

representative sample over time. Linguistic and cognitive assessments were administered to the children at ages three, five, and seven, the first assessment at age three serving as a baseline measurement against which to measure attainment at ages five and seven. The baseline consisted of four subtests of the British Ability Scales II (Block Building, Verbal Comprehension, Pictures Similarities, and Naming Vocabulary) and the overall General Cognitive Ability (GCA). Five subscales from the British Ability Scales II were administered to the children at age 5: Verbal Comprehension, Picture Similarities, Naming Vocabulary, Pattern Construction and Early Number Concepts as well as the Letter Recognition test (Clay, 1993) and the subscales Rhyme and Alliteration from the Phonological Awareness assessment (Bryant & Bradley, 1985). Children at age seven were assessed using the National Assessment Tests (SATs) in reading, writing and mathematics. In addition, information was collected on parental, family, child, and home characteristics, child care history, and ethnic status for use as predictors and/or control variables in subsequent analysis. They reported that maternal educational levels and the home learning environment during the preschool years were the strongest predictors of academic and behavioural outcomes for children at age 10 years.

Sénéchal (2006) examined the longitudinal relations among early literacy experiences at home and children's literacy skills in Kindergarten, word reading and spelling skills in grade one, and reading comprehension, fluency, spelling, and reading for pleasure in grade four. Ninety French-speaking children were tested at the end of Kindergarten and grade one and 65 were followed until the end of grade four. Parents of children in Kindergarten reported that storybook reading occurred frequently and that they sometimes taught their child to read words. Results revealed that parent teaching about literacy in Kindergarten directly predicted Kindergarten alphabet knowledge as well as reading fluency in grade four. Storybook exposure directly predicted vocabulary in Kindergarten and the frequency with which children reported reading for pleasure in grade four. Storybook exposure indirectly predicted reading comprehension in grade four.

Tamis-LeMonda & Rodriguez (2009) list three aspects of children's experiences in the home environment that are critical to early language growth and learning. These aspects include: the provision of certain learning activities like reading to children on a daily basis, a parenting style characterized by responsiveness, and the provision of materials such as age-appropriate toys and books. In addition, they point out that parents with higher education levels and higher economic resources are better able to provide positive learning experiences for their young children.

Early learning opportunities that are provided for children outside the home need to recognize the key role played by family and develop partnerships with families that are open, honest and respectful. These valued partnerships will ensure that everyone involved is working together to promote the learning interests of children.

Investing in Early Childhood Learning: Building Human Development

Historically, early childhood learning programs have been rarely seen as economic development initiatives. However, the work of neuroscientists with respect to brain development in the early years suggest economic savings by investing in early learning programs, particularly in the area of social-emotional development. Furthermore, research by leading economists around the world has linked investment in early childhood development with economic prosperity, productivity and competitiveness for both the individual and society. Charles Coffey, former executive vice-president of the Royal Bank of Canada Financial Group and former director of the Council for Early Child Development, David Dodge, former governor of the Bank of Canada, and two other prominent Canadian economists, Gordon Cleveland and Michael Krashinsky, all argue that investing in the early years is justified by the returns provided to society in the long term.

Investment in early childhood learning builds human development because younger children have a longer span of time to yield returns to society. James Heckman, a Nobel Laureate in Economic Sciences, builds the premise that “skills beget skills”, more people acquire more skills which lead to more skilled people. *“The returns to human capital investments are greatest for the young for two reasons: (a) younger persons have a longer horizon over which to recoup the fruits of their investment and (b) skill begets skill”* (Heckman, 2000, p.39). Thomas Sticht (2010), the 2003 recipient of UNESCO’s Mahatma Gandhi Medal for his work in adult literacy, further develops that premise by arguing that investment in early childhood learning that includes a component for parents is a long-term investment in what he terms “*multiple life cycles*” (p.52) as it relates to parenting practices and activities. The Canadian Council on Learning Reports, 2007, 2008, 2009, 2010; Dodge, 2003; and Shonkoff, 2007 all stress the importance of investing in early childhood learning programs as it relates to social and economic returns.

Longitudinal studies like the Perry Preschool Project and the Abecedarian project have yielded sound empirical evidence that high quality early childhood programs yield significant positive benefits for both the children and society in general. Both projects are models of comprehensive integrated programming that combined early learning, health, home-visiting, non-parental care, and parenting supports. The findings based on rigorous evaluation of these high quality preschool programs include substantial positive effects of early environmental experiences on cognitive and non-cognitive skills, achievement, job performance, and social behaviours long after the programs ended (Schweinhart et al, 2005; Masse and Barnett, 2002). The Perry Preschool Project and the Abecedarian project which evaluated the effects of child parent centres located in or near public schools in the city of Chicago produced key findings that included significant higher educational attainment and lower rates of juvenile arrests (Reynolds et al, 2004).

Other research has studied the impacts of community-based early learning programs and services that offer a combination of early learning programs and supports for families. These include supports such as home visits and opportunities for parents and children to interact and are accessible to all children and parents in a neighbourhood or community, not exclusive to those living in vulnerable circumstances. Penn et al (2004) in an international review of early years studies concluded that programs that integrate opportunities for both children and parents are beneficial for children aged birth to 6. In a study of British children by Sylva et al (2004), the researchers reported that children who attended early learning programs that incorporated parenting supports made better progress intellectually. Findings from the Kindergarten Data Collections of the Early Childhood Longitudinal Study, Birth Cohort (Denton & McPhee, 2009) showed that children enrolled in child care and preschool environments scored higher on reading, mathematics, and fine motor assessments than children with no regular attendance in preschool or participation in early childhood programs in the year prior to Kindergarten.

Economists have begun to quantify the economic impact of investing in early childhood learning in both the short-term and long-term benefits to the individual and society. As Figure 1 illustrates, Cameiro and Heckman (2003) calculate that the return on the investment in primary and secondary education is 3:1 whereas for early childhood learning programs it is 8:1. Cunha et al (2005) calculated that a \$1 invested in early childhood returns three times as much as a \$1 invested for school aged children and eight times as much a \$1 invested for adult education. Jacques van der Gaag, professor of Development Economics, Universiteit van Amsterdam, calculated that for every \$1 invested in early childhood programs the return to society is \$3. He linked the benefits of early childhood programs to health, education, and social capital. Lynch (2004) supports growing global evidence that investment in early childhood programs easily pay for themselves over time by generating very high returns for participants, the government, and the public, *“While participants and their families get part of the total benefits, the benefits to the rest of the public and government are larger and, on their own, tend to far outweigh the costs of these programs”* (p.4). Fairholm (2009) estimated a benefit-cost ratio of 2.54 to 1 for the Canadian early childhood sector.

“The returns to human capital investments are greatest for the young for two reasons: (a) younger persons have a longer horizon over which to recoup the fruits of their investment and (b) skill begets skill.”

(Heckman, 2000, p.39)

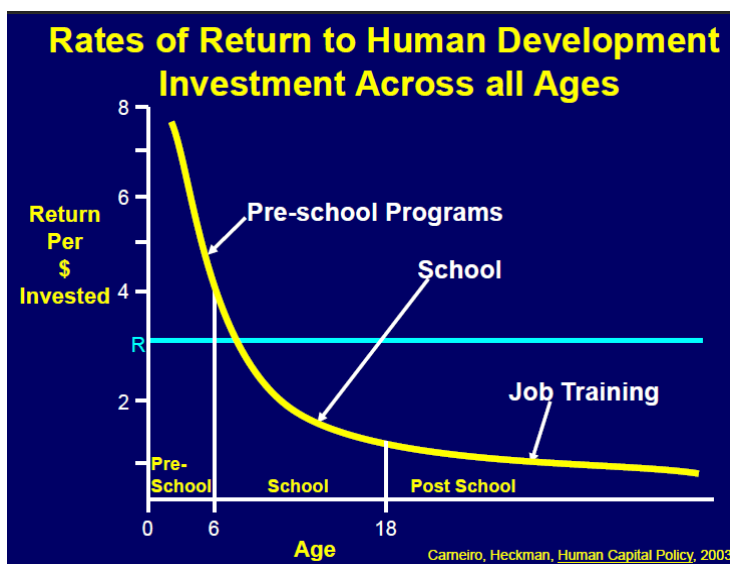


Figure 1: Rates of Return to Human Development Investment Across all Ages (Cameiro & Heckman, 2003)

Neurological Development

There is a vast amount of research linking early learning opportunities to children’s long term developmental outcomes as well as health, employment and well-being throughout the life course. According to the Canadian Council on Learning (2010), “Research indicates that the experiences during the first five years of a child’s life have a major bearing on his or her future success in school, in the workplace, and many other aspects of a healthy, fulfilling life” (p.10)

Research findings conducted over the past three decades have led to an understanding of the rapid growth of the brain in the early years and how stimulation acts as a catalyst for that growth. In *The Early Years Study* (1999) and *The Early Years Study 2: Putting Science into Action* (2007) Dr. Fraser Mustard of the Council for Early Child Development (CECD) and others have established that the experiences in the early years 1) shape the architecture of the brain and 2) set the developmental trajectories that influence lifelong learning, behaviour, and health for individuals.

During the prenatal period and infancy, physical brain development occurs at a faster pace than at any other time in a person’s development. Prenatal, the brain grows more significantly in size and function than at any subsequent stage of development. Neurons are produced at an astonishing rate and begin to form neural networks. Postnatal, the networks within the brain are transformed into a complex web of visual, motor, language, and socioemotional connections. The basic brain cells exist at birth; hence a baby is born ready to learn. However, brain development and the capacity to learn are heavily dependent on early life experiences. During the first three years of life, brain connections

develop quickly in response to outside stimulation. The brain's ability to physically change its structure and function (neural plasticity) occurs in response to external experiences. All parts of the brain change as a result of experience but not all parts of the brain are equally plastic. Parts that are highly plastic at birth have a narrow window of time and changes that occur in that window can significantly impact later plasticity (Diamond & Hopson, 1998; Hyman, 1999; Wolfe & Brandt, 1998; Bertrand, 2001; Jameison, Bertrand, & Ibrahim, 2008). By the time a child reaches three years of age, the brain has tripled in size (Kolb & Whishaw, 2006).

The Council for Early Child Development (CECD) founded by Dr. Fraser Mustard in 2004 has provided an abundance of research studies which illustrate that the early years are a period of opportunity where children's experiences establish a powerful neural foundation for later development. The more experiences provided to babies, the more opportunities they have to permanently establish learning pathways in their brain. The physical wiring and sculpting process of the brain is not merely dependent on environmental stimulation, but is also dependent on the timing and quality of the stimulation. Keating & Hertzman (1999) point out that the experiences that young children have while their brain is developing will remain with them for their entire lives. Furthermore, Irwin, Siddiqi, & Hertzman (2007) in their final report for the World Health Organization's Commission on early child development concluded that "*what children experience during the early years sets a critical foundation for their entire lifecourse*" (p.3). Conversely, this time can be a risk where development can be compromised, the effects of which can be seen throughout life. Adults, particularly parents/caregivers, play a vital role in providing stimulation that establishes the neuron functioning of the brain which ultimately determines the pathways for language, coping, and understanding. The graph in Figure 2 developed for the Council for Early Child Development (CECD) based on Nash (1997), *The Early Years Study*, (1999), and Shonkoff & Phillips, (2000), shows the sensitive periods in early brain development for the first seven years of a child's life.

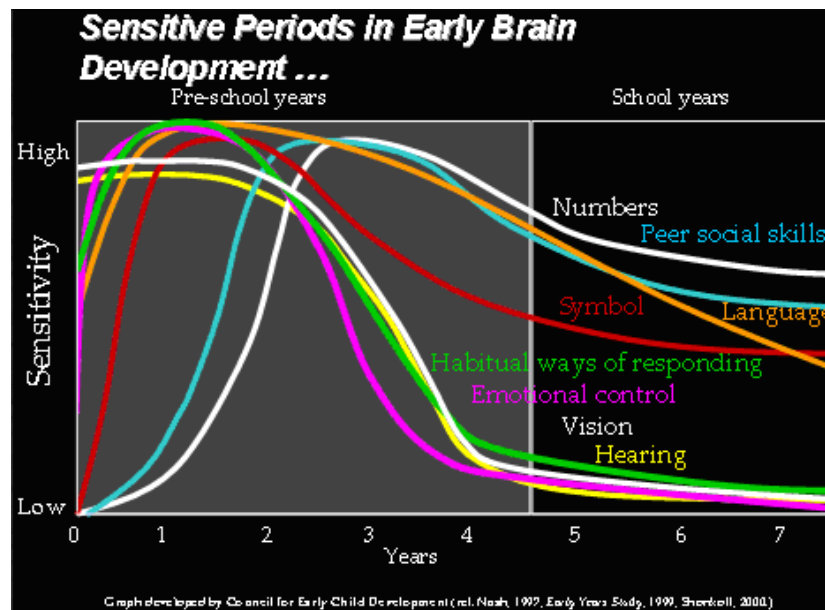


Figure 2: Sensitive Periods in Early Brain Development

Research findings around neurological development and the impact of early childhood experiences can be summarized into the following core concepts:

- experiences in the prenatal period and the early years shape the architecture of the brain (physical)
- there are sensitive periods in early brain development
- brain development is life-long, cumulative and integrated
- brain development influences life-long learning, behaviour and health
- young children's relationships with significant adults in their lives impact on brain development
- nurturing experiences and environments promote healthy brain development
- young children's experiences are critical to healthy brain development and capacity to learn
- early learning experiences need to encourage child-directed discovery

Predictors of Optimal Early Learning

Many factors contribute to the early learning experiences of children. They can be influenced by economic and social determinants such as family income, levels of parental education, social connectedness, security, and place of residence. The *Report on the State of Public Health in Canada 2009* identifies socio-economic status (SES) as an individual's or group's position within society, dependent upon a combination of factors, including occupation, level of income, the levels of individual education in the household, wealth, and place of residence. Differences in SES have been linked to the kinds of early learning experiences of young children and consequently to their success in

school and beyond.

An extensive project by the New Zealand Council for Educational Research, Ministry of Education, New Zealand that began in 1993, followed approximately 500 students in the areas of cognitive, social, and communication skills development at two-year intervals at ages 4, 6, 8, 10, 12, 14, and 16, culminating in 2005. The researchers explored the students' home and education experiences to find out which of these experiences might account for differences in their patterns of development and performance over the course of these years. In analyzing four key social characteristics, gender, ethnicity, family income levels, and parental education levels, they found that parental education levels and levels of income carried more weight than gender or ethnicity because they are related to the kinds of learning experiences and opportunities that happen in the home environment. However, upon further analysis, the researchers found that maternal educational levels had the largest association with students' cognitive and attitudinal competencies at age 16. Students who had mothers with high levels of education were more likely to start school with high cognitive, social and communication skills competencies, and more likely to maintain these competencies throughout school. The difference in performance was linked to the kinds of experiences and opportunities that the children of highly educated mothers tended to have. The researchers found that the children of highly educated mothers were more likely than the children of less-educated mothers to have experiences, such as talking, playing games, and singing with their parents that expanded their knowledge and skills.

Quasi-experimental studies suggest that increases in maternal education when their children are young (between the ages of four and six) may improve the academic skills of young children, especially those living in families with low income, even when the mother's earnings did not increase (Magnuson, 2003). In a 2007 study by Moore & Schmidt it was found that a mother's enrollment in education during the first three years of her child's life was associated with higher mathematics and reading achievement by age six.

Canadian researchers have demonstrated that while effective early learning programs are crucial for particular groups of children and their families, they benefit all groups of children and their families. Many vulnerabilities are not income sensitive. Willms (2001) in his exploration of the findings of the *National Longitudinal Study of Children and Youth* showed that the majority of vulnerable children live in moderate, middle-class and affluent families. His analysis of the data indicated that 66% of four and five year olds with low receptive verbal skills come from two-parent, middle-income families. While low socioeconomic status is associated with risks for young children, supports to young children and their families that are universal in nature magnify overall social, economic and academic benefits for all children and their families and society in general. Chao and Willms (2002) point out that their findings, based on a large representative sample of Canadian families, support the claim that



“It is essential to ensure that first relationships are trusting and caring, as early relationships provide an important foundation for later development.”

www.gemma-nl.org

positive parenting practices occur at all socioeconomic levels and that universal programs that support all families are more likely to have a significant effect in reducing childhood vulnerability than targeted programs. The culmination of research findings has identified four primary areas of early childhood development that impact on future learning, success in school and life. They are: social-emotional development, self-regulation, language and early literacy development, and mathematical development. Also established in the research are the importance of play as a means to learning and the importance of early learning programs being developmentally appropriate.

Social-Emotional Development

Young children experience their world through an environment of relationships. Beginning at birth, nurturing, secure, and stable relationships with caring adults are essential for the development of feelings of trust, safety, and confidence. During the infant stage, developing strong attachment relationships with parents/caregivers and other significant adults in their lives is very important for children. Researchers at the National Scientific Council on the Developing Child at Harvard University (2004) established that the quality of early relationships between children and the significant adults in their lives sets the foundation for later developmental outcomes and affects virtually all aspects of their social-emotional, physical, and cognitive development. The significant adults around children are the most important contributors to their social and emotional development. Early relationships lay the foundation for social competency and later relationships with peers. Parental support greatly increases the likelihood that children will develop early emotional competence (Boyd et al, 2010). Children who feel safe in a supportive environment are more likely to take risks in problem-solving and inquiry as their self-confidence and competency grow.

The foundations of social competence developed in the first five years of a child’s life are linked to emotional well being and social skills needed later in life (Berchied & Reis, 1998; Reis et al, 2000). While social and emotional development is important in its own right, it is also important because it facilitates cognitive development. Children with effective social and emotional skills do better with getting along with others, understanding directions, and focusing on a task; skills that enhance learning and important in school success and lifelong learning. The brain circuits that regulate the emotions in the early years are ultimately associated with the development of problem-solving skills (Posner & Rothbart, 2000).

Emotional, behavioral, and cognitive functioning in the early years are more closely connected than had been previously understood (Shonkoff & Phillips, 2000). *“In particular, a child’s emotional status affects early school performance, which in turn predicts later school outcomes”* (Knitzer, 2002, p.7). Children who are able to focus attention, understand directions, get along with others, and control negative emotions of anger and distress do better in school than children who have difficulty with social and emotional competence

“Singing songs, reading aloud and playing with letters are all activities that set the stage for learning to read and write and improve your child’s well-being.”

www.child-encyclopedia.com

(Arnold et al., 1999; McClelland et al., 2000). In reviewing a persuasive body of rigorous research to determine whether children’s emotional adjustment can be significantly affected by interventions implemented in the preschool and early school years, Raver (2002) concluded that *“Children who are emotionally well-adjusted have a significantly greater chance of early school success while children who experience serious emotional difficulty face grave risks of early school difficulty”* (p.1).

Attachment

Attachment refers to the relationship developed between an infant and a parent/primary caregiver during the first two to three years of life that involves an exchange of care, comfort, and pleasure. According to Brotherson (2005), *“the way in which a parent responds to and interacts with a young child is the key factor in how an attachment develops”* (p.2). How a parent/primary caregiver responds to a child’s needs for care, comfort, and security during this period determines how the child-parent/caregiver relationship is formed. Perry (2008) describes attachment as involving the comfort and soothing of a child through rocking, cooing, hugging and smiling by a primary caregiver. Children who receive responsive and consistent caregiving early in life develop secure attachments to their parents/caregivers and learn to trust their caregivers. For example, breastfeeding can enhance the emotional bond between a mother and a child. *“Breastfeeding, along with so many other benefits, helps with attachment...”* (Salluit Maternity Staff 2010, p.2). These experiences in infancy and early childhood between the child and the primary caregivers form, nourish, and maintain the attachment, which in turn contribute to healthy emotional relationships with others as the child grows and matures. Primary caregivers and other significant adults in a child’s life can foster the development of a healthy attachment by smiling at their baby/young child, making eye contact, and using touch for comforting and soothing.

The Centre of Excellence for Early Childhood Development refers to parent-child attachment as a “bond of trust”. It goes on to describe it as the emotional connection between a baby and the parents/caregivers. Psychologist John Bowlby’s attachment theory is based on the idea that the nature of the early relationship that develops between an infant and caregiver provides the foundation for later social, emotional, and cognitive development. In addition, Bowlby contends that early attachment relationships continue to influence feelings, thoughts, and close relationships throughout life. Children who grow in a secure environment where they can rely on the significant adults around them learn to trust others in their world. These feelings help children to adjust to new situations and environments (e.g., child care, school, making new friends) and increase their likelihood of becoming exploratory, active learners.

Egeland (2009) cited that research findings over the past three decades have demonstrated that secure attachment in infancy is a predictor of aspects of social development during childhood and adolescence and behaviour



difficulties. Secure attachment has been shown to be a predictor of more optimal developmental outcomes while insecure attachment to be a predictor of behaviour and relationship difficulties.

A longitudinal study by Toews, Kolkhorst, & Yazedjian (2009) examined the connection between the parent-adult child attachment relationship, adjustment, and achievement among college students. The researchers found that the quality of the parent-child relationship was related to adjustment during year one and three. Additionally, the quality of the relationship was related to grade point average during both years.

In summary, children who are secure in their attachments tend to:

- explore their environment more freely
- learn with confidence
- be more popular with peers
- exhibit more positive social interaction
- be more emotionally stable
- be able to express and manage their feelings well
- demonstrate greater ability to handle stress and help others handle stress

When developing programs that support parents of children birth to age three, the implications of attachment theory and research findings need to be considered. One key message to include for parents is the importance of early attachments to a child's future development and learning.

Prevention/intervention programs can be incorporated into home visitations and parent programs for families living in vulnerable circumstances where children might be at risk for insecure attachments.

Self-regulation

Self-regulation is difficult to define universally. The term has been used interchangeably in the research literature with such terms as self-control and delay of gratification to explain the processes individuals use to manage drives and emotions. However, Shanker (2010) asserts that self-control is a key element of self-regulation and cannot be viewed as one and the same. He views self-regulation as a five-domain model: 1) biological, 2) emotional, 3) cognitive, 4) social and 5) reflective thinking. Self-control falls under the emotional domain where a child learns to monitor and modify his/her emotional responses. Similarly, studies on delay of gratification such as the one conducted by Mischel et al (1989) demonstrate how delay of gratification and self-regulation are used interchangeably and are closely linked. In fact Mischel et al (1989) consider delay of gratification in young children to be predictive of self-regulatory competencies later in adolescence and adulthood.

According to Dr. Claire Cameron Ponitz, cited in Hoffman (2009) self-

regulation is the ability to control and direct one's own actions, thoughts, and feelings. It can be as simple as waiting to take a turn when playing a game, or as complex as controlling one's feelings when frustrated or angry. Ponitz contends, *"With regard to early development, children who learn to control themselves and make good choices do better socially and academically than children who are overly angry, aggressive or impulsive"* (p.1).

Perry (2001) emphasizes that self-regulation is an essential part of healthy emotional development. He believes self-regulation contributes to preventing aggression and anti-social behaviors in children. Children are born with an undeveloped capacity to self-regulate, however, this capacity changes and matures as children grow. According to Perry, *"Healthy self-regulation is related to the capacity to tolerate the sensations of distress that accompany an unmet need. With the capacity to put a moment between a feeling and an action, a child can take time to think, plan and usually come up with an appropriate response to the current challenge. This transition from external regulation to self-regulation is one of the most important tasks of growing up."* (p. 2-3).

Bodrova and Leong (2008) further define self-regulation by describing it as having two sides: 1) the ability to control one's impulses and to stop doing something, and 2) the ability to do something (even if one does not want to do it) because it is needed. They cite research conducted by Blair (2002) and Blair & Razza (2007) which showed that children's self-regulation behaviour in the early years predict school achievement in reading and mathematics. Their study examined the role self-regulation played in emerging academic ability in 141 three to five year old children living in families with low incomes. The researchers sought to determine the extent to which children's developing self-regulation is associated with emerging math and literacy skills in Kindergarten. Their findings included that all aspects of children's self-regulation are uniquely related to their academic skills, over and above their intelligence. They also found that the aspect of self-regulation used in planning, problem solving, and goal-directed activity, was predictive of all academic outcomes, particularly those associated with mathematics.

Make-believe play is a powerful tool for building self-control and self-discipline according to Berk, as cited in Spiegel (2008). One of the reasons why is because during private speech, children talk to themselves about what they are going to do and how they are going to do it. This applies in the classroom as well. Berk and Bivens (1990) conducted a longitudinal study where they carefully recorded the private speech and task-related actions of 75 first to third graders as they worked alone at their desks on math problems. The team of researchers followed the first graders and monitored their behavior as second and third graders. The results showed that every child observed used private speech 60 percent of the time. First graders who made many self-guiding comments out loud or quietly did better at second-grade math. Likewise, second graders who often muttered to themselves grasped third-grade math more easily the following year. Berk concludes that the time that children spend using



Do you know?

The work of neuroscientists with respect to brain development in the early years suggest economic savings by investing in early learning programs, particularly in the area of social/emotional development.

private speech actually helps them develop a critical cognitive skill referred to as executive function. One of the central elements of executive function is self-regulation. Children who are able to effectively self-regulate can control their emotions and behavior, resist impulses, and exert self-control and discipline.

Dr. Walter Mischel began researching children and self-control back in the 1960's and 1970's with his famous "Marshmallow Test". (Mischel et al, 1990). The longitudinal study was conducted over a six year period, during which time, 653 preschool children participated in at least one experiment. The design of the experiment involved leaving four-year-olds in a room with a bell and a marshmallow. Each child was given a set of simple instructions. If they rang the bell, Mischel would come back and they could immediately eat the marshmallow. If, however, they didn't ring the bell and waited for him to come back on his own, he would bring them another marshmallow - thus giving them two to eat. Follow-ups were conducted ten to twelve years later where questionnaires were sent to the parents of participants of whose mailing addresses were known. These follow-ups yielded data on a total of 185 children. What Mischel found over years of following test subjects was that the number of seconds children could wait at age four was predictive of social, cognitive, and interpersonal competencies later in life. Children who rang the bell early in order to eat the marshmallow had reportedly more behavioral and academic problems growing up, got lower SAT scores, struggled in stressful situations and had limited friendships as adults (Serani, 2009).

Fuchs et al (2003) contend children with good self-regulation spend more time trying to figure out problems before offering solutions and are more flexible in their approach to solving a problem. A study conducted by Ponitz and McClelland (2007), assessed more than 300 preschool children at two different sites in Michigan and Oregon. Using a game called the Head-to-Toes Task the children were tested for their ability to listen, pay attention and regulate their own behavior. The researchers found that children's performance on the behavioral regulation game significantly and positively predicted early literacy, vocabulary and math skills even after controlling for initial skills in those areas. More specifically, they found that children who showed improvement on a simple task designed to measure self-regulation skills also showed improvement in emergent literacy, vocabulary, and early mathematics skills. This was after the results were controlled for age, gender and other background variables.

To summarize, self-regulation in children:

- has been often times used interchangeably with the terms self-control and delay of gratification
- is an important aspect of social-emotional development
- begins to develop during the preschool years and continues to develop and mature into adulthood
- impacts on early academic success as they are called up to regulate their

attention, control impulses, communicate effectively and engage in learning experiences

Oral Language and Early Literacy Development

Oral language development begins before birth. It continues to increase and strengthen in the pre-school and early school years. Infants pay attention to the sounds of speech and significant adults in their lives encourage this natural ability when they speak often to them. Toddlers begin to understand and produce speech to communicate their wants and needs and to interact with others. At age three, early literacy skills begin to develop and continue parallel to language skills development. Older children (ages four to six) have a growing understanding of the purpose of written language and the conventions of print. Hoff (2009) concluded that language development is very similar across children and even across languages; however the rate of development varies widely, depending on the amount and nature of children's language experience.

Dickenson and Tabors (2002) identify strengths in homes and in preschool early learning programs that build strong language and literacy foundations. The study is based on the assumption that rich language experiences during the preschool years play an important role in children being able to read with comprehension when they reach middle school. The researchers followed 74 children from preschool through seventh grade. Conversations in preschool early learning settings and the homes were conducted; mothers and preschool teachers were interviewed to identify the kinds of interactions and experiences that made a difference in children's later literacy skills. A battery of language and literacy assessments were administered to the children beginning in Kindergarten, including the ability to understand words, letter knowledge, early reading and writing, and phonemic awareness. Each year assessments in language and literacy were administered to the children. Analysis of data revealed that exposure to varied vocabulary, opportunities to be part of conversations, and early home and learning environments that are cognitively and linguistically stimulating are three dimensions of children's experiences during the preschool and Kindergarten period that are related to later literacy success. Based on their results, they concluded that the early childhood period is key to getting children off to a strong start in language and literacy and that building early foundations in rich oral language contributes to latter literacy development.

The vocabulary children bring to written text affects their reading and comprehension. It has been established that children's vocabulary, in particular, in Kindergarten is one of the best predictors of reading comprehension in grades three and four (Sénéchal, Ouellette, & Rodney, 2006; Storch & Whitehurst, 2002). A study by Hart and Risley (1995) showed that children born into families with low incomes were exposed to less cumulative vocabulary than children born into families with higher incomes. They established that the difference in verbal skills at age three still held at age nine. These findings are consistent with the evidence that the most sensitive period



for language development is in the early years (Nelson, 2000) and that poor verbal skills during the early years result in poor language and literacy skills later in life. Bertrand (2006) estimated the difference in the cumulative number of words addressed to a child in the first four years of life based on family income, from approximately 10 million for children in families with low incomes to approximately 50 million for children in families with high incomes. These differences have been shown to be related to the resources available in the home and maternal patterns of verbal interactions as early language development is rooted in the early social exchanges children have with their parents and other significant adults in their lives (Lucchese & Tanis-LeMonda, 2007).

In a longitudinal New Zealand Study (2008), when the association of maternal education levels and family income was accounted for, it was found that family income alone had a relatively small association with competency levels. However, researchers did find that the level of family income when a child is age five continued to have statistical significance when associated with literacy and numeracy levels at age 16. Davis-Kean (2005) points out those parents with higher educational levels are more apt to engage their children in more learning-related opportunities in the home and in environments outside the home.

A five-year longitudinal study was conducted by Sénéchal & LeFevre (2002) in Ottawa, Ontario with 168 children from families with middle and upper middle incomes. Three cohorts of children from three schools participated in the study: two cohorts of Kindergarten children (N=110) and one cohort of children in grade one (N=58) followed to the end of grade three. One of the objectives of the study was to assess the long term influence early literacy experiences at home have on reading achievement, measured at the end of grade three. Parents completed an extensive questionnaire at the beginning of the study using a five point scale (1=never, and 5 = very often) about home literacy experiences measuring the frequency of storybook reading and the frequency of teaching their children to read and print words. At the beginning of grade one, children were assessed for receptive language, phonological awareness, emergent literacy, analytic abilities, using the Peabody Picture Vocabulary Test-Revised, the Stanford Early School Achievement Test, Concepts About Print Test, and the Weshler Preschool and Primary Scale of Intelligence-Revised. Reading at the end of grade one was assessed using the vocabulary and comprehension subtests of the Gates-MacGinitie Reading Tests. The Kindergarten cohort was assessed using the Woodcock-Johnson Psycho-Educational Battery-Revised. Results showed that children's exposure to storybook reading at home was related to vocabulary development and listening comprehension skills, and that these skills were directly related to children's reading in grade three. Researchers found that early literacy skills directly predicted reading at the end of grade one and indirectly predicted reading in grade three. According to Raviv, Kessenich, & Morrison (2004) of particular importance for young children in their language and cognitive development is the quality of the mother-child interactions and the verbal responsiveness of the mothers.

“Research on children’s learning in the first six years of life validates the importance of early experiences in mathematics for lasting positive outcomes.”

(National Council of Teachers of Mathematics, 2007, p.1)

Mothers with high levels of education tend to be more verbally engaging and responsive to their young children, such as asking questions and playing games that use language that build vocabulary and encourage them to reply (Richman, Miller & LeVine, 1992; Tracey & Young, 2002). This research substantiates Hoff-Ginsberg’s (1998) research with mothers of two year old children that compared high school educated mothers and college educated mothers and the difference between the language interactions with their children. She found that college educated mothers talked more, asked more questions, and used fewer directives with their children than high school educated mothers all of which impacts on oral language and early literacy development. Rosenzweig and Wolpin (1994), using data from a National Longitudinal Survey of Youth (NLSY), found that maternal education completed during the period from a child’s birth to three years old improved the child’s later vocabulary and academic skills.

Conversation with parents and other significant adults in their lives is one of the most valuable resources for emergent literacy. Informal back and forth talk between a child and parents provide building blocks for oral language development. Activities such as storytelling, singing, role-playing, and conversations all help to develop and sustain oral language development with young children. Later reading and writing extend and represent oral language. Tamis-LeMonda & Rodriguez (2009) reported that central to children’s early language development is consistent participation in shared book reading and storytelling as a means to expanding their vocabulary. They also point out that in their review of the research that the amount and style of language that parents/caregivers use with young children is a strong predictor of children’s early language. According to Christie and Roskos (2009) the development of early language skills are linked to later reading comprehension and fluency.

The results and conclusions from these studies have implications for programs that support young children and their families. Parent-focused supports targeting parenting practices that encourage activities at home can foster oral language and early literacy development for the children in those families. Providing environments in the home and in other settings that are rich in oral language, print, shared storytelling and reading promotes the development of vocabulary, early reading, and early writing for young children.

To summarize:

- The development of language is a continuum that begins before birth and continues to increase and strengthen through the pre-school and early school years
- The most sensitive period for language development is in the early years
- Research has established a link between early language development and early literacy development
- The period of early childhood is key to getting children off to a strong start in language and literacy.
- Interactions that involve conversations and talk with significant adults is

one of the most important contributors to the development of oral language and early literacy development in the early years.

- Research points out that the amount and style of language that parents/caregivers use with young children is a strong predictor of children's early language development.
- Levels of family income and levels of maternal education are related to the kinds of language interactions young children experience in the home
- The vocabulary children bring to written text affects their reading comprehension and writing skills
- Providing environments that are rich in talk, print, shared storytelling and reading foster the development of vocabulary, early reading, and early writing for young children.

Early Mathematical Development

Children's intuitive attention and interest in number emerge long before they begin formal schooling. Lock and Gurganus (2004) propose that an early sense of number may well be the building block of mathematics. It develops through a variety of experiences as young children develop basic counting skills, literally see small quantities, and add small amounts. Having young children share their thinking by having them touch objects as they count, draw pictures, and explain "how they know" helps them to develop their understanding and use of numbers. Tudge and Doucet (2004) noted that "*numbers are just as much a part of everyday activities as letters*" (p.35). Number sense in mathematics development is sometimes likened to phonemic awareness in reading development. It is much more than counting; it involves the ability to work with numbers easily and to understand their different uses and relationships.

Knowledge of counting and quantity has the potential to develop quickly as babies grow into toddlers. Preschoolers have the capability of thinking about and solving mathematical problems in different ways. Ginsburg et al (2008) cite evidence by researchers Baroody, Lai, & Mix (2006); Clements & Serama (2007); and Ginsburg, Cannon, Eisenband, & Pappas, (2006) that show that young children from birth to five years of age develop informal ideas of size, space, pattern, shape, more and less, taking away, location, and position that are actually quite sophisticated, complex, and broad. This informal knowledge sets the stage for learning more complex mathematical skills and concepts (Osana et al, 2010).

The mathematics knowledge children acquire prior to entering school has implications for school performance. Shaklee et al (2008) in their review of the research report that "*research suggests that children's early mathematical experiences play an enormous role in the development of their understanding of mathematics, serve as a foundation for their cognitive development, and can predict later school success at the high school level*" (p.1). According to the National Council of Teachers of Mathematics (NCTM) (2007), "*Research on children's learning in the first six years of life validates the importance of early*

experiences in mathematics for lasting positive outcomes” (p.1). Duncan et al (2007) used data from six large-scale longitudinal studies and found that across all six studies the strongest predictors of later achievement were school-entry math, reading, and attention skills. However, further analysis of the results found that early mathematics skills had the greatest predictive power, followed by reading and attention skills.

A socio-cultural view of mathematical development acknowledges that young children's engagement and learning are affected by mathematically-related influences from a variety of 'others' in the child's life (Bronfenbrenner, 1979, Rogoff, 2003). Through tracking a cohort of students in England through primary school, Aubrey, Dahl & Godfrey (2006) found that children who exhibit mathematical knowledge when they enter school appear to be advantaged in terms of their mathematical progress through primary grades. They concluded that children who enter school with limited mathematical knowledge continue to under achieve throughout their primary years unless there is active intervention on their behalf. Jordan et al (2009) examined children's number competencies over six time periods from the beginning of Kindergarten to the middle of grade one in relation to their mathematics achievement over five later time periods, from the end of grade 1 to the end of grade three. They found that the relationship was strong and significant and that the number competence in Kindergarten predicted the rate of growth in mathematics between grade one and grade three as well as achievement levels through to the end of grade 3.

The frequency of activities related to early mathematical development in the home has been linked to family income and maternal levels of education. There is growing evidence that differences in young children's mathematical knowledge in early childhood are related to socioeconomic status (SES). A study by Starkey, Klein, & Wakeley (2004) found a significant SES-related gap in mathematical knowledge at the beginning of the pre-Kindergarten year. They contend that young children from families with low incomes receive less support for mathematical development than their peers from families with higher incomes. When the researchers implemented an intervention program they found that while it significantly enhanced the mathematical knowledge of both groups of children, the children from families of lower incomes acquired more knowledge, relative to their starting point, than the children from families with higher incomes. The level of maternal education and their level of understanding of mathematics both impact on the frequency of mathematical activities that occur in the home with young children. Paris, Morrison and Miller (2006) showed that Kindergarten children's mathematical performance was higher when the level of mother's education was at the post-secondary level.

In an attempt to understand how different cultures and, how families within cultures from different socioeconomic levels support children's early mathematical development, Starkey & Klein (2006) undertook a study of 600 three to six year old American, Chinese, and Japanese children. The study



“The developmental literature is clear: play stimulates physical, social, emotional and cognitive development in the early years”.

(Hewes, 2006, p.1)

included equal numbers of children from lower and higher socioeconomic backgrounds. Intra-cultural variation favoring children from families with higher incomes was found in each country and group differences appeared by age three years. In all three countries mathematics activities were undertaken more frequently by young children in homes with higher family incomes than in homes with lower family incomes and parenting practices varied with family SES. The findings revealed the age by which group differences appear in early mathematical development, and the impact of parenting practices on development of early mathematical knowledge.

Ginsburg et al (2006) point out that young children are highly motivated to work with numbers and enjoy numeracy activities on their own. They are eager to imitate rote counting, make attempts at counting objects, make comparisons of more and less, and pay attention to patterns and shapes. However, the authors state that children will learn more about mathematics when they have opportunities to engage in numeracy activities on a daily basis in a playful, natural way at home and in other settings. As a result, these children are more prepared when they encounter numeracy activities in formal schooling. Children who are encouraged to play with, talk about, and think about numbers at home and in other early learning environments experience mathematical concepts as a natural part of their world. The informal mathematical language and understanding that they use in their play becomes the basis for formal mathematical language and understanding as they move through school. For example, children who are provided with opportunities to play with blocks discover in a natural way the size relationships among them and the more frequently they make the comparisons the more complex their thinking develops. Providing young children at home with materials such as blocks, shapes, and puzzles that inspire mathematical thinking can foster the development of skills such as early numeracy, patterning, and measurement (Sherman-LeVos, 2010). Universal programs that provide support to parents/families with respect to the types of mathematical activities they can do at home with their children builds on the intrinsic motivation of young children to engage in mathematical activities.

Duncan et al (2007) used data sets from six large-scale longitudinal studies: The Early Childhood Longitudinal Study–Kindergarten Cohort (ECLS-K), a nationally representative sample of 21,260 children who were in Kindergarten in 1998–1999; the National Longitudinal Survey of Youth (NLSY), a multistage random sample of 12,686 individuals age 14 to 21 in 1979 (Center for Human Resource Research, 2004); the NICHD Study of Early Child Care and Youth Development (SECCYD) drawn from a multisite study of births in 1991 (NICHD Early Child Care Research Network, 2005; the Infant Health and Development Program (IHDP, an eight-site randomized clinical trial with a total of 985 low birth weight (2500 g/5.51 lb or less) premature infants in 1985; the Montreal Longitudinal-Experimental Preschool Study (MLEPS) comprised of several consecutive cohorts of four and five year old children launched from 1997 to 2000 for a total of 767 children; and the 1970 British Birth Cohort Study (BCS) a nationally representative longitudinal study that followed into

adulthood a cohort of 17,196 infants children born in Great Britain during the first week in 1970 with a reduced the sample size for most analyses to between 9,000 and 10,000 cases. The researchers found that across all six studies the strongest predictors of later achievement were school-entry math, reading, and attention skills. However, a meta-analysis of the results showed that early math skills had the greatest predictive power, followed by reading and then attention skills. Furthermore, the researchers found that patterns of association were similar for both boys and girls and for children from families of all socioeconomic circumstances.

Klibanoff et al (2006) using a sample of 146 four-year olds drawn from 13 preschool settings and day-care centers in the Chicago area examined whether the amount of mathematical speech, “math talk”, used by the adults in these settings was related to gains in children’s mathematical knowledge. The researchers documented the talk of the adults through audiotaping adult speech and the observers completed a ten item questionnaire based on the National Association for the Education of Young Children’s (NAEYC) preschool checklist (Hyson et al., 1990). The audiotaping allowed the researchers to assess adult mathematical speech as it occurred rather than relying on adults’ memory of what had occurred. The children’s math knowledge was assessed for the following: ordinality, cardinality, calculation, shape names, understanding “half,” and recognizing conventional number symbols. Children were assessed individually using an assessment consisting of 15 questions administered in the fall (October) and again in the spring (April), with each session lasting about 10 minutes. To minimize practice effects, alternative forms of the assessment were used and the order of forms counterbalanced across children. The researchers found that the amount of “math talk” had a positive impact on children’s mathematical understanding over the school year. Developing a healthy disposition toward mathematics has been a topic of research in the past decade. Children are not born with a negative disposition or a natural aversion towards using mathematics. Young children play mathematics as they explore, problem-pose and problem-solve across a variety of situations as a regular component of their everyday play. Children with a healthy disposition toward mathematics have a positive attitude toward their ability and the value of mathematics in their lives. They enjoy doing mathematical activities and games and believe that they are capable of reasoning or solving a problem themselves. They show persistence and curiosity when they meet a challenging problem. In the early years young children are developing their beliefs about what mathematics is and about themselves as mathematics learners. The NCTM (2000) Position Paper on mathematics in the early years emphasizes the importance of young children’s first experiences with mathematics being encouraging, engaging and positive as their early experiences influence their performance in later years. Kilpatrick et al (2001) say that in addition to the concepts and skills that underlie mathematical proficiency, children who are successful in mathematics have a positive disposition towards mathematics. Providing opportunities for young children that are developmentally appropriate and joyful helps them to experience success and meet challenges that build their confidence.

Perso (2006) describes a numerate individual as one who has both the knowledge of mathematics and the confidence and ability to apply that knowledge to everyday living. In an increasingly complex world, practical applications of mathematics to a wide range of everyday situations are very important. An implication for early learning opportunities in mathematics is that young children build a strong foundation in mathematics in learning environments that encourage active and engaged participation.

In summary:

- Research has found that mathematical thinking undergoes extensive development over the first five years of life
- Learning opportunities in the first years of a child's life are vital for nurturing a child's mathematical interest, confidence and competence
- The support of parents and other significant adults in exploring mathematics through play and everyday activities is important in a child's mathematical development
- Informal mathematical knowledge developed in the early years serves as a foundation for development of formal mathematical knowledge
- Children's knowledge of mathematics is a strong predictor of later academic achievement
- Listening and talking with young children about mathematical concepts helps them develop a positive disposition toward mathematics
- Play provides opportunities for young children to explore and talk about mathematical concepts
- Opportunities to engage in mathematical activities on a daily basis in a playful, natural way helps prepare children for when they encounter mathematical concepts in formal schooling
- Disposition toward mathematics is important to children's mathematical development

Learning Through Play

Play is a healthy, essential part of childhood. Infants explore their world through their senses while adults in their world foster their development and learning through playing games with them. Toddlers engage in pretend play when they imitate actions and events they have experienced in their family life. As they grow into four and five year olds, young children engage more and more in play activities that expand their knowledge of the world around them, develop their motor skills, and focus on their peers.

It is not an easy task to simplify what play is; defining play needs to be viewed from many angles. Kenneth Ginsberg of the American Academy of Pediatrics contends that, "*Play is essential to development... Play allows children to use their creativity while developing their imagination, dexterity and physical, cognitive and emotional strength.*" (Ginsberg, 2007, pp. 182-183). Miller and Almon (2009) describe play "*as activities that are freely chosen and directed by children and arise from intrinsic motivation*" (p.15). According to Kagan and Lowenstein (2004) play that is child-centred and engaging promotes

Research and experience show strong relationships between a child's capacity to play and his or her overall development - physical, social, emotional, and intellectual" (Almon, 2007, p.3).

learning. However one chooses to define play, a true play-based program is one where children participate in a balance of child-initiated and adult-guided activities in an environment where play is encouraged and nurtured.

There has been an abundance of research around play and its positive effects on development. In general, research shows strong links between creative play and language, physical, cognitive, and social development. Research from the 1970s in Germany showed that by grade four, children who had attended play-oriented Kindergarten surpassed children who attended academic-oriented Kindergarten in physical, social, emotional and cognitive development. The findings were so compelling that, after a period of switching to a more academic approach, Germany converted all of its Kindergartens to play-based programs.

In the High/Scope Perry Project conducted with three to four year olds in the 1960s, the children were divided into three groups: one group participated in a program that was play-based, one group received academic oriented direct instruction, and a third group participated in a program that was a combination of both. Through tracking all three groups to age 23, research found that the group that had participated in the play-based program showed gains over the other two groups. Marcon (2002) found results similar to those of the Perry Project. She followed children from different preschool programs through to grade four. She reported that those who attended play-based programs did better academically than those who had attended academic-oriented programs. When children play they integrate all types of learning. Almon (2007) concludes: *"Research and experience show strong relationships between a child's capacity to play and his or her overall development - physical, social, emotional, and intellectual"* (p.3). Dr. Jane Hewes (2006, 2010) states *"the developmental literature is clear: play stimulates physical, social, emotional and cognitive development in the early years"* (2006, p.1) .

Play and Social-Emotional Development

Playful social interactions begin at birth. (Bergen, 2002; Bredecamp & Copple, 1997). As children grow into toddlers, pretend play develops. Dramatic play involves imitating and is enacted either alone or with others. As children interact with each other they learn concepts and skills in cooperating, listening to others, handling frustration, and empathizing with others, all of which are important in the development of self-regulation and social negotiation.

Numerous studies have shown that children who have good social skills and good emotional health are more likely to succeed academically (Berk, Mann, & Ogan, 2006; Fromberg, 2002; Shonkoff & Phillios, 2000). Through rough and tumble play children learn the give-and-take of appropriate social interactions and learn to signal and detect signals, a social skill needed through school and life. Sociodramatic play that entails verbal communication and interaction in small and large groups where children have to put themselves in another's place fosters empathy and consideration for the feelings of others. Role-playing within a group helps a child to define social roles, practise turn taking, and be



Do you know?

Play is a healthy, essential part of childhood.

accepted by others; all important to successful group interaction needed later in life. Dramatic play allows children to develop appropriate social behavior (Burke, 2010).

Play and Neurological Development

Recent research in neurological development confirms that early relationships, attachment, exploring the world through play, movement, language, and hands-on activities are essential to a healthy childhood. According to Dr. Fraser Mustard of the Council for Early Childhood Development, “*problem based play programs optimize development of neural pathways during all periods of early childhood from infancy to grade one. Consistent play opportunities with other children provide rich sensory stimulation that the young child absorbs and integrates into core brain development*” (Early Years Study 2, 2007, p. 139). According to Perry, Hogan & Marlin (2000), “*And central to a child's healthy development is the opportunity to act on their natural curiosity – to explore, to play and, thereby, to learn*” (p.1). They go on to point out that play and exploration help a child’s brain develop in optimal ways and emphasize that opportunities for play in a safe, nurturing and developmentally and age appropriate environment should be the focus of all child-centred learning programs.

Play and Physical Development

Early childhood is an important period in the life of a child for rapid physical development. Play provides activity through which a child’s body gains strength and dexterity. Active play helps to develop gross motor skills, fine motor skills, agility, coordination, and balance. For example, playing with blocks assists with finger dexterity and kicking a ball assists with large muscle development, agility, coordination, and balance. Young children who are provided with opportunities to develop their fine and gross motor skills and balance skills are more likely to reach a higher level of success when they meet new physical challenges when they are older (Stover, 2009, Rees, 2009). Play that develops large muscle skills (e.g., hopscotch) usually requires little or no equipment. Thelin (2009) emphasizes that outdoor play for young children helps them with their sensory development because when they are playing outdoors they are using all of their physical senses. At the same time playing outdoors helps with their physical development and coordination and reduces the chances of children being overweight or obese. Outdoor environments that provide opportunities for children’s physical development also allow them opportunities to engage in pretend play. Carlson (2006) points out that that intense physical exertion of rough and tumble play supports cardiovascular health and meets vital touch needs of children.

Play and Oral Language and Early Literacy Development

Play and literacy are inter-related. Play is enhanced when children draw from their knowledge and experience with stories and topics they have been exposed to through books and conversations. Engaging in pretend play allows children to develop oral language skills, storytelling, vocabulary, and explore the function of written language as a means to early literacy development. For

example, when children are playing in a kitchen centre they are developing their language skills when they speak to their peers about what they are cooking, the ingredients they are using, and when they write about what they are constructing. As they pretend play, they are increasing their vocabulary, sentence length, and mastering the semantics of language (Perry, Hogan & Marlin, 2000).

As reported in Zigler, Singer and Bishop-Josef (2004), embedding literacy materials in pretend play increases young children's engagement in literacy acts. Using environmental print in pretend play helps children understand what reading is and how print works. For example, placing literacy materials like lists and newspaper grocery flyers in a kitchen play centre helps children to understand that print carries a message. Through dramatic play, like acting out parts of a story they have heard or had read with them, children develop their oral language skills and the capacity for understanding narrative. During play, children often imitate literacy acts that they have seen adults model, such as "writing" lists. Playing with language builds a base through which children later learn to decode words (Burke, 2010).

Play and Early Mathematical Development

Play contributes to the development of early logical/mathematical thinking. Play allows children opportunities to participate in problem solving activities, investigate and discover, explore cause and effect through hands-on experiences. All of these are a part of numerical thinking and mathematical development. Bredecamp and Copple (1997) stated that "*in exploratory play children understand relationships and concepts which they acquire through first hand experiences.*" Jarrell referenced in Pronin Tromberg & Bergen (1998) says "*play is vital to the development of children's mathematical thinking. Unlike some forms of knowledge, mathematical knowledge, which deals with relationships between and among things, cannot be learned by hearing adults talk about it*" (p.56). Playing with sand, blocks, water and clay helps children to develop their skill in logic. For example, playing with blocks encourages problem-solving, reasoning and divergent thinking and playing with water leads to knowledge of volume. Being familiar with shapes, directions, and positions as they use boxes to build a tower helps children in their understanding of mathematics. The "informal" language they use as they talk about such concepts as "over", "on", "higher", becomes the basis for "formal" mathematical language later in their learning. Through play and problem-solving children learn that there is more than one way to solve a problem, a skill increasingly important in today's world.

In summary:

- play is a healthy, essential part of childhood
- research shows strong links between play and language, physical, cognitive, and social development
- when children play they integrate all types of learning
- play helps a child's brain develop

- outdoor play helps with children’s sensory and coordination development
- play contributes to the development of early logical/mathematical development

Copple & Bredekamp (2009) sum up the importance of play to a child’s overall development in the following way: *“Play is an important vehicle for developing self-regulation as well as for promoting language, cognition, and social competence”* (p.14).

Developmentally Appropriate Practice (DAP)

Developmentally appropriate practice is a phrase coined by the National Association for the Education of Young Children (NAEYC). DAP is based on a philosophy of education that espouses the idea that children are active learners who construct their own knowledge by interacting with peers, teachers and other adults, and materials. It describes teaching techniques that identify and foster the developmental needs of children, both individually and in groups (Bredekamp and Copple, 1987, 1997, 2009). It is culturally sensitive, inclusive, and emphasizes the developmental level and the learning style of the whole child in terms of physical, cognitive, social and emotional needs.

Cognitive learning theories rooted in the work of Piaget (1969) and Vygotsky (1978) undergird developmentally appropriate practice. These learning theories are based on the premise that knowledge is constructed over time based on experiences and interactions the learner has with his/her environment. Jean Piaget formulated a series of developmental stages of play that corresponded to the stages of cognitive development in children. In the first stage that occurs from birth to approximately two years old, the sensori-motor stage, children are focused on gaining mastery of their own bodies and external objects. Their play in this stage consists of repeated patterns of sound or movement, such as sucking and babbling. Eventually, they will play peek-a-boo by interacting with the adults around them. In the pre-operational stage, from two to seven years old their play is characterized by make-believe and they use objects for purposes other than their intended use or function. At this age social interaction with others in their environment becomes more important to them. Piaget believed that pretend play strengthens and consolidates new learning and understandings.

Vygotsky’s (1978) theory of “scaffolding” with respect to developmentally appropriate practice occurs when an adult working with young children build on their prior knowledge and experiences to encourage them to reasonably stretch towards new learning. As a child begins a new challenge, a greater amount of scaffolding from an adult is required to help manage the new learning; however, the adult tries to provide the least amount of support that the child needs in order to do something s/he cannot do alone. As the child becomes more comfortable and more capable of handling the task alone the adult gradually decreases the amount of scaffolding support and

provides it only as long as it is needed. The key for the adult is to know how much scaffolding is needed and when it is needed to help the child move along in his/her learning and development.

Hirsh-Pasek, Hyson, & Rescorla (1990) used data from a two-year project to examine whether early academic environments provide a challenge or a pressure for young children. School philosophy and practices and parental attitudes and behaviours comprised the predictor variables used to define “academic environments”. The study focused on how these school and family variables related to child outcomes measures of academic competence, creativity, and emotional well-being of 90 pre-Kindergarten children and a follow-up sample of 56 Kindergarten children. The results suggest no academic advantages for children enrolled in highly academic environments. The researchers found that children in the developmentally appropriate settings scored higher on measures of creativity, or divergent thinking, than the children in the academically oriented classrooms.

Burts et al (1992) used a sample of 166 first-grade students who had attended Kindergarten classrooms with teaching practices identified as predominately developmentally appropriate or developmentally inappropriate to explore the relationship between the developmental appropriateness of Kindergarten instruction and performance in reading, language, spelling, math, science, and social studies. Findings indicated that the students who had experienced more developmentally appropriate Kindergarten classrooms had higher reading averages than the students who had experienced developmentally inappropriate Kindergarten classrooms. In an earlier study (1990) the same research team found that children in developmentally inappropriate classrooms exhibited more total stress behaviours throughout the day, more stress in group situations, and more stress when completing individual activities.

The purpose of a study undertaken by Jambunathan, Burts, & Pierce (1999) was to investigate whether the use of developmentally appropriate practices in preschool settings is related to the perception of self competence among preschool age children. Ninety-one children of diverse backgrounds attending seven different preschool programs participated in the study. The Pictorial Scale of Perceived Competence and Social Acceptance was used to measure self competence; the Checklist for Rating Developmentally Appropriate Practices in Early Childhood Classrooms was used to measure developmentally appropriate and inappropriate practices. Teaching strategies, curriculum goals, motivation, and guidance of social-emotional development were found to be significant predictors of the peer acceptance component of self competence. The researchers concluded that the results of their study suggest that developmentally appropriate curricula promote opportunities for social development of children.

The HighScope Preschool Curriculum Comparison Study Research, conducted by Schweinhart, Weikart, & Larner (1986) and Schweinhart & Weikart (1997) tracked 68 children, ages three and four to the age of 23 who had participated in



the original Perry Project conducted in the 1960s. Children in the original study were randomly assigned to one of three preschool models: Direct Instruction model, a traditional Nursery School model, and the HighScope model. The Nursery School and HighScope models emphasized child-initiated activities with staff support and the Direct Instruction approach focused on an academic model. By fifteen years of age, students in the HighScope group and the Nursery School group reported only half as much delinquent activity as the students in the Direct Instruction group. By age 23 years, the HighScope group and the Nursery School group showed statistically significant gains over the Direct Instruction group on seventeen variables. At age 23 years, the HighScope and Nursery School groups when compared with the Direct Instruction Group had significantly fewer felony arrests and fewer years of intervention services.

Marcon (1999) compared the self-help, language, motor, and social development, as well as mastery of basic skills of 721 four year olds randomly selected from three different preschool models: child-initiated, academically directed, or a "combination" approach. Findings indicated that children who were enrolled in the child-initiated model demonstrated greater mastery of basic skills at the end of preschool than did the children who had been enrolled in the academically directed model. Children who had experienced the "combination" model did significantly poorer on all measures, except self-help and development of social coping skills, compared to children in either the child-initiated or "combination" models. Marcon (2002) did a follow-up study of a sample (160) of the children at the end of third grade and 183 of the children at the end of grade four. The study examined report card grades, retention rates, and special education placement of the children. The research found that by the end of fourth grade, children who had experienced the academically directed preschool model earned significantly lower grades compared to children who had experienced the child-initiated preschool model. Girls surpassed boys academically at the end of grade three and grade four.

Early childhood learning settings (e.g., child care, early interventions, Kindergarten) that are based on developmentally appropriate practices have *"plenty of space and time for unstructured play and discovery, art and music, practicing social skills, and learning to enjoy learning"* (Miller and Almon, 2009, p.11). There is a balance of child initiated play in the presence of engaged adults and more focused experiential learning guided by adults. One of the principles of child development and learning that inform developmentally appropriate practice according to Bredecamp & Copple (2009) is that play is a vehicle for the development of self-regulation, language, cognition and social competence. An early learning setting that has only child initiated play without the active support of an adult can result in a chaotic environment where limited learning takes place. An early childhood learning setting characterized by only adult directed play with little or no child initiated play can result in a very didactic approach to learning. In an early learning setting where the principles of developmentally appropriate practice are employed learning occurs through a balance of child initiated and adult guided play.

Overview of Developmentally Appropriate Practice (DAP)

Approach to learning

- A child-centred approach to learning
- The focus is on the learning needs of the child
- The learning environment is set up to facilitate the development of skills in all domains and to allow for independence
- There are quiet areas, active areas, and outdoor areas to accommodate children's needs and temperaments
- It is based on the child's prior knowledge, interests, and needs
- Learning happens naturally when conditions are optimal
- Play is the primary vehicle for learning
- Opportunities are provided to allow the children to interact with a variety of concrete materials, equipment and supplies
- The daily routines include large blocks of time to allow children to explore activities arranged around the room and engage in individual, small group and large group activities
- Uninterrupted time is provided to allow the children to explore
- Children are engaged in free play and organized play
- The classroom provides a balance of whole group, small group, and individual activity for students.
- There are quiet times and times of active exploration
- Assessment of children's learning and development is used in order to plan, implement, and evaluate learning experiences that have been provided

Role of adults

- The adult's role is that of facilitator and enabler
- Adults provide active support to children as they engage in child-initiated play and experiential learning
- There is a balance of child-initiated and adult-guided play
- Adults promote developmentally appropriate practices and eliminate those that are not
- In program settings adults use various assessment tools to inform their planning and instruction and to meet the individual needs of the children
- Teaching techniques include asking open-ended questions, modeling, demonstrating, scaffolding, and direct instruction

Resources

- Materials support children's development in all domains
- Parent information and professional developmental opportunities strengthen understanding of the principles of DAP
- Materials, methodology, and activities are aligned with a child's development.
- Resources to support the delivery of programs/services encourage exploration and discussion (open-ended)



Research that tracked three to four year olds to the age of 23 who had participated in the Perry Project conducted in the 1960s, found that the group that had participated in the play-based programs showed gains over the a second group who had received academic-oriented direct instruction and over a third group who had received a combination of both play-based and academic-oriented program. Marcon (2002) found similar results when she followed children from different preschools through to grade four. She reported that those who attended play-based programs did better academically than those who had attended academic-oriented programs.

In summary, developmentally appropriate practice (DAP):

- focuses on the learning needs of the child in all domains
- uses a balance of child-initiated and adult-guided play as the primary means of learning
- assessment of children's learning is used to inform planning
- materials, methodology and activities are aligned with a child's development level

Full-day Kindergarten

Most of the research related to full-day Kindergarten has been undertaken in the United States; however, the findings have been supported by research in Canada and elsewhere. The overall findings have been strongly supportive of full-day Kindergarten in particular as it benefits children with respect to: their social-emotional development; academic development, in particular their early language and literacy development; transition to grade 1; narrowing the gap of achievement for children from families with lower incomes; and better integration of Kindergarten students into the school community. Canadian scholars, McCain, Mustard, and Shanker (2007) argue that effective early childhood programs available to all children improve the well-being of society in general as they reduce inequities, especially in education and health.

Full-day Kindergarten that is based on the principles of early childhood development and learning maximize learning opportunities for Kindergarten children. It provides a wider range of benefits than a half-day program primarily because it allows for large blocks of time for a play-based, developmentally appropriate approach to learning. It allows for more time for hands-on experiences, inquiry, and exploration that are responsible for most of the learning that occurs for children of Kindergarten age. Full-day Kindergarten allows more time to use a play-based, developmentally appropriate approach to learning and teaching to meet curriculum outcomes and address learning in all areas of development, including cognitive, social-emotional and physical development. It does not seek to hurry young children into academics at an earlier age, rather it builds the foundation for later learning. Full-day Kindergarten provides teachers with more opportunity to interact with children individually and in small groups, providing children with individual supports and facilitating group interactions. It gives more time for teachers to explore and extend topics, concepts, and children's interests. Teachers have more time for developmentally appropriate assessment of learning and for communicating

with parents/caregivers.

In 2010, the Kindergarten Curriculum Guide for Newfoundland and Labrador, *Early Beginnings* originally published in 1997, was revised to incorporate best practices based on current research. The new guide, *Completely Kindergarten* (Interim Edition, 2010), has been designed to present a balanced approach to teaching and learning. It recognizes that a balance of child-centred and adult-directed approaches to teaching and learning is necessary to meet the outcomes in all content areas in a classroom environment that promotes play-based learning and developmentally appropriate practice. It recognizes the developmental nature of a Kindergarten child. In the section of the guide entitled “Understanding the Kindergarten Child” the importance of play in Kindergarten is highlighted: *Play is the foundation of all learning in Kindergarten and is the most appropriate means by which children can work through scenarios, take risks, and solve problems while recognizing their preferred learning modalities and styles.*” (p.2). The Guide includes a separate section on the importance of play and play-based learning in the classroom and includes opportunities for play-based learning to help children achieve learning outcomes. Also included are cross-curricular connections where applicable to enable teachers to deliver outcomes using a cross-curricular approach. The revised Curriculum Guide would be applicable to a full-day Kindergarten program in Newfoundland and Labrador. The important role of play in learning and meeting the curriculum outcomes through play is included in professional development sessions for teachers and emphasized during curriculum implementation.

Supportive Research Findings

Miller and Almon in *The Kindergarten Crisis* (2009) point out that play in Kindergarten is not a laissez-faire, anything-goes environment, nor is it so tightly structured that children are not given the opportunity to learn through their own initiative and exploration. Instead it is “*a balance of child-initiated play in the presence of engaged teachers and more focused experiential learning guided by teachers.*” (p.12). This balance of child-initiated and adult-guided play is applicable for all early childhood learning environments (refer to Figure 4).

THE KINDERGARTEN CONTINUUM

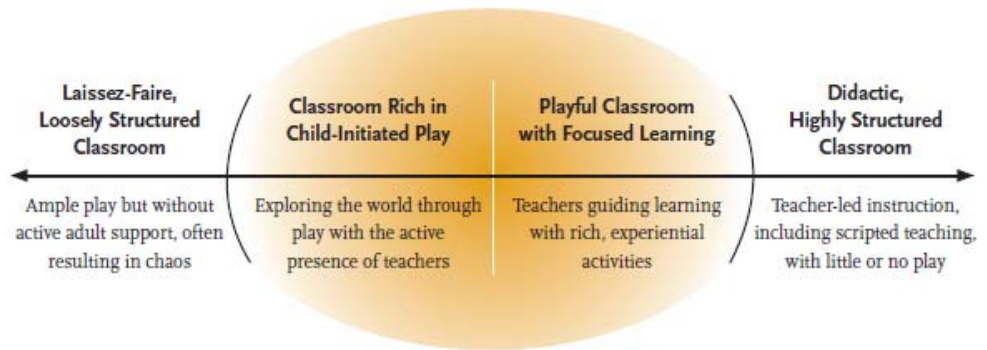


Figure 4: The Kindergarten Continuum (Miller & Almon, 2009)

Elicker & Mathur (1997) over a two year period carried out an evaluation of a newly implemented full-day Kindergarten program. The study included 12 separate Kindergarten classes (four full-day classes and eight half-day classes) with a total of 179 Kindergarten children (69 full-day and 110 half day). Throughout the two year period researchers collected data on children's participation in classroom activities using the Early Childhood Classroom Observation System (ECCOS). At the end of each school year, Kindergarten report cards were analyzed in the areas of reading, writing, mathematics, science, creative learning, work habits, social development, and motor skills. Four interviews were conducted with each Kindergarten teacher and parents were surveyed during the fall and spring of each Kindergarten year. As documented by the ECCOS observations, when compared with children in half-day Kindergarten, children in full-day Kindergarten spent more time in child initiated activities, especially in learning centres, more time in teacher-directed individual learning, and relatively less time in teacher-directed large groups. Children in full-day programs exhibited more active engagement and displayed more listening engagement than children in half-day programs. Teachers in the full-day programs reported that having a full-day gave them more time to get to know the children and their families, more opportunities to work with children individually, more time to meet with parents, more time to manage assessment of learning, and more time for curriculum planning. Results of the parents' views from the parents' surveys indicated that full-day programming gave the children more time to explore and learn, more time for the teacher to get to know the child in a less hurried environment, and more time for social interaction for the children. Progress as measured on Kindergarten report cards and readiness for first grade were rated significantly higher for children in full-day Kindergarten.

Data from the *Early Childhood Longitudinal Study-Kindergarten Class of 1998-99 (ECLS-K)* based on a sample of more than 20,000 children from across the United States provide information on how teachers and children in full-day Kindergarten spend their time. Results suggest that with the extra time over half-day Kindergarten children are able to spend more time in self-selected activities and teachers have more time to devote to language arts and mathematics activities.

Hough & Bryde (1996) in a quasi-experimental study explored the ways in which full-day Kindergarten is beneficial to students compared to half-day Kindergarten. The sample consisted of six schools with full-day Kindergarten matched with schools with half-day Kindergarten on school size, socioeconomic status, geographic location, and student norm-referenced data. Data was collected using classroom observation, video and audio taped interviews with students, teachers and parents, report cards of the students included in the sample, parent and teacher survey questionnaires, and norm-referenced achievement tests administered to all students. Findings revealed: greater utilization of small group activities in full-day Kindergarten; greater number of social interactions among students in full-day Kindergarten; students in full-day Kindergarten outperformed students in half-day Kindergarten in language arts, mathematics and norm-referenced achievement tests; and higher overall satisfaction for parents of children in full-day Kindergarten.

There is a body of research that shows that the benefits of full-day Kindergarten extend beyond the Kindergarten year and persist over time. Wahlstrom et al. (2004) in a longitudinal study in Burnsville, Minnesota public schools found that the cohort of students who had attended full-day made dramatic gains in all academic areas by the end of their Kindergarten year. The same cohort was tracked into the third grade. Researchers found that the gains of the children who had attended full-day Kindergarten were statistically significant in grade 1 and continued into third grade. In particular, students who were considered “at-risk” that had attended full-day Kindergarten outperformed their peers who had attended half-day Kindergarten at every measurement comparison for grades one, two, and three. Weiss & Offenber, (2002) in their study of 17,600 children in Philadelphia observed effects through third and fourth grades. They found that students who had attended full-day Kindergarten were more likely to do better in reading and mathematics, get better grades overall, and have better school attendance than their counterparts who had attended half-day Kindergarten.

Using data gathered from three Canadian schools, da Costa and Bell (2001) examined the effects of full-day Kindergarten on students’ development of literacy skills as measured by Clay’s Observation Survey. Quantitative data were collected using six subtests of the Survey in early October 1999 (pre-test) and again in June of 2000 (post-test) from two low socioeconomic inner city schools offering full-day Kindergarten and one suburban school with a broad range of socioeconomic status offering half-day Kindergarten in two classes. Both programs used a play-based, child-centred approach to learning and

focused on social, emotional and cognitive development. In terms of language and literacy growth, students in the full-day Kindergarten program performed significantly better on all six subtests, after taking into account age, gender, and previous ability upon entering Kindergarten. The researchers concluded from their findings that full-day Kindergarten children experienced greater growth in their pre-reading skills than the children in half-day Kindergarten.

In partnership with Edmonton Public Schools da Costa conducted a longitudinal study (2001-2004) that addressed the question: *What are the longitudinal reading and writing effects of full-day Kindergarten on students at the end of Kindergarten, grade one, grade two, and grade three?* Cohort 1 (2000-01) consisted of 261 full-day Kindergarten students and a comparison group of 293 students enrolled in half-day Kindergarten. Cohort 2 (2001-02) consisted of 291 students enrolled in full-day Kindergarten and a comparison group of half-day Kindergarten students. To assess emergent readers' reading skills in their Kindergarten year Clay's Observation Survey was administered to all full-day and half-day Kindergarten students in October (pretest) and again in June (post-test). Data were also collected by the school district for Cohort 1 at the end of grades one, two, and three and for Cohort 2 at the end of grades one and two using district developed standardized tests in reading and writing. Data gathered from provincial criterion-referenced tests based on the provincially mandated English language arts curriculum for language arts administered at the end of grade three were also used. Research findings evident at the end of the Kindergarten year indicated that the children who were in full-day Kindergarten programs, particularly those from lower economic circumstances, were more likely to become emergent readers than those not enrolled in a full-day program. By the end of the Kindergarten year, the children from families with low socioeconomic circumstances were achieving at par with their counterparts from families with higher socioeconomic circumstances. Furthermore, the full-day Kindergarten students from families with low socioeconomic circumstances continued to achieve at par with the rest of the school district on the district developed standardized tests in reading and writing at the end of grades one, two, and three.

In summary, research studies indicate that compared to half-day programs, full-day Kindergarten results in many benefits for children in all areas of their development and learning. It promotes learning in a play-based, child-centred, developmentally appropriate environment, allowing additional time for teachers to provide children with individual and small group attention.

Realizing the Vision of the Strategy

The provincial early childhood learning strategy is intended to provide young children and their families with community based, universal and accessible programs and services that support early childhood learning opportunities. The success of the strategy will be reflected in the extent to which young children in

our province develop the physical, social-emotional, self-help, language and cognitive skills necessary for success in school and throughout life. Monitoring the implementation of the strategy at key intervals is essential to inform planning and to evaluate its effectiveness.

The success in realizing the vision of the early learning strategy is dependent on the ability to provide early learning opportunities that support the province's young children and their families. Collaboration and partnership among families, communities, government and other stakeholders committed to providing the best possible early learning experiences for young children.

Below are two examples of instruments used both nationally and internationally for the purpose of monitoring children's overall development.

The Early Development Instrument (EDI)

The Early Development Instrument (EDI), developed by D. Offord and M. Janus at McMaster University, Canada, is a population-based tool used to gauge children's development at the Kindergarten level. Even though questionnaires are completed for each child, the data can only be interpreted at the group level. The checklists are completed by Kindergarten teachers for each child in the class after knowing the child for approximately six months. It is a holistic measure of children's development across five areas: physical health and well-being; social competence; emotional maturity; language and cognitive development; and communication skills and general knowledge. The data can be used to establish a baseline estimate of the state of early child development in Kindergarten for any given group of children. It is not a measure of individual child development or a diagnostic measure. The data is aggregated at a group level for the purpose of community mapping. It informs community stakeholders, schools, families, and governments how the programs, policies and resources provided support young children and help them to make informed decisions on how to build and strengthen early childhood development. It has been administered throughout Canada and internationally.

Early Years Evaluation (EYE)

The Early Years Evaluation (EYE), developed by J.D. Willms and J. Beswick, New Brunswick, Canada, consists of two instruments: the EYE-Direct Assessment (EYE-DA) and the EYE -Teacher Assessment (EYE-TA). The EYE-DA is an individually-administered direct measure of developmental outcomes for pre-school children. The EYE-TA is used to assess developmental outcomes for children in Kindergarten. The EYE assesses children's development in four areas: awareness of self and environment; cognitive skills; language and communication; and gross and fine motor development. Results for the EYE-DA are generated for each student and are shared with the parents. A class profile report is generated for the EYE-TA to be used by the classroom teacher. EYE measures can be used to assess learning needs of individual children prior to entering school, upon entry, or shortly after school entry and to provide a baseline for assessing learning gains. However, it is not used to

diagnose specific learning problems. Results can also be used to monitor early childhood outcomes at a school, community or province level.

Other Developmental Assessment Tools

A comprehensive review of developmental assessments suitable for use with children birth to age six years has been completed. Two such reviews include: *The Developmental Screening and Assessment Instruments with an Emphasis on Social and Emotional Development for Young Children Ages Birth through Five* (2008) compiled by The National Early Childhood Technical Assistance Centre (NECTAC) and the *Commonly Used Assessment Tools for Children With Special Needs Ages Birth to Six and Their Families* (2005) compiled by the Early Intervention Task Force Mount Saint Vincent University published by Centre of Excellence for Children & Adolescents with Special Needs.

Conclusion

In summary, the importance of the early years in early childhood learning and overall development and longer term outcomes is well documented in research. Parents play a critical role in their children's early learning as their first and foremost teacher. Initially, parent's role early in their child's life is to provide warm, sensitive and responsive care-giving that will promote a sense of belonging, security and healthy attachment. From birth and throughout the preschool period, parents and other caregivers play a vital role by providing a safe and stimulating environment rich in adult guided experiential play experiences. Parents can take a role in their children's learning by comforting and responding to children's needs as well as reading, talking, singing, dancing and exploring the world with their children. The types of interactions that parents have with their children and early experiences lay the foundation for children's early learning and all subsequent learning experiences. This in turn, has a tremendous impact on individual longer term health, well-being, and success in life. The importance of early childhood learning experiences in shaping children's development throughout their lives is well documented. Current research has provided a better understanding of how children learn in the early years and the importance of quality early learning opportunities.

Government is specifically interested in what it can do to enhance early childhood learning opportunities, support parental involvement and create a smooth transition to school for all children and their families. A well planned early childhood learning environment that is supportive of the individual needs of all children and incorporates inclusive practices is optimal.

A provincial early childhood learning strategy based on current research and best practices focuses on the following statements:

- Children learn best in play based environments.
- Supporting parents and families during the early years is critical.
- Building on the interests, strengths, and needs of communities to support early childhood learning is necessary to provide community based, universal and accessible early childhood learning opportunities for children and their parents/caregivers.

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