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AUTHOR da Costa, Jose L.; Bell, Susan
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ABSTRACT

This study examined the actual and perceived effects of full-day kindergarten on students' growth in play and problem solving, language and literacy, and socioemotional development. Participating in the study were two kindergarten teachers and their classrooms serving similar diverse inner city populations in western Canada, one a half-day program and the other a full-day program. Data sources included semi-structured interviews with kindergarten staff, anecdotal comments generated by the teacher throughout the year for student report cards, quantitative data on student progress, and quantitative data on a comparison group of students in a half-day kindergarten. The findings indicated that both programs were generally in keeping with principles exhibited by exemplary programs. Instruction in both programs was focused on the whole child and emphasized the role of the learner in social context. All students in the full-day program experienced substantial growth over the course of the year in play and problem solving, language and literacy, and socioemotional development. The majority of the full-day students were either already reading or on the verge of reading independently. Full-day students experienced significantly greater growth in reading prerequisite skills than half-day students. Play-based instruction was highly effective for kindergartners. Full-day kindergarten may be especially beneficial for students of low socioeconomic backgrounds. The full-day program was only possible due to the donation of an anonymous benefactor. Based on findings, it was concluded that the sensitivity to detect differences between the two types of programs needs to be increased. (Contains 13 references.) (KB)

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**Full Day Kindergarten at an Inner City Elementary School:
Perceived and Actual Effects**

José L. da Costa, Ed.D.,
Educational Policy Studies,
University of Alberta
(780) 492-5868
E-mail: <Jose.da.Costa@Ualberta.ca>

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Susan Bell, M.Ed.,
Consultant, Reading Recovery/Early Childhood Education
Edmonton Public Schools,
Edmonton, AB.
(780) 429-8405
E-mail: <sbell3@epsb.edmonton.ab.ca>

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Full Day Kindergarten at an Inner City Elementary School: Perceived and Actual Effects

Existing Research and Literature

Considerable research has been conducted into kindergarten programs both nationally and internationally (e.g., Corter & Park, 1993; Fusaro, 1997; Housden & Rose, 1992; Ohio State Legislative Office of Education Oversight, 1997; Rothenberg, 1995; Sergesketter & Gilman, 1988). The focus of the reported research has been primarily on kindergarten curricula and on student time spent in kindergarten. In a review of the literature, Corter and Park (1993) found agreement among the teachers, principals, consultants, and parents regarding what constituted exemplary kindergarten practices. They noted six principles, namely:

1. underpinning the kindergarten program of studies should be a play-based child-centred philosophy;
2. the focus of the program should be on the *whole* child;
3. the child should be placed in the social context;
4. parents and administrators should recognize and support the teacher;
5. all interest groups should work towards structured and balanced programs; and
6. schools and society in general should provide support for kindergarten.

No mention was made by Corter and Park (1993) regarding instructional time in kindergarten. Along the same vein, Meyer et al. (1985) argued that for the purpose of developing student literacy it is crucial to systematically study not only what and how programs are implemented, but also to examine “the long-term effects of various kindergarten programs with an academic focus versus programs that are individualized for teachers and students.

The literature reports many reasons for varying the length of the school day for kindergarten children. In support of full-day programs, the reasons range from “eliminating the need to provide buses and crossing guards at mid-day” (Rothenberg, 1995), to “providing an academic advantage to all students (Ohio State Legislative Office of Education Oversight, 1997). A review of the literature does, generally, support the notion that full-day kindergarten provides an academic advantage for students. In a recent study of 77 children in East Brunswick Public School District in New Jersey, Alber-Kelsay (1998) found that those grade one children who had attended full-day kindergarten scored higher than their half-day counterparts as measured on all areas of the standardized portfolio assessment measuring instrument. Furthermore, these students performed particularly well on the Developmental Spelling Assessment sub-test of the standardized portfolio. In another longitudinal study spanning three years, Koopmans (1991) found that the long-term effect of attending an all-day kindergarten program provided grade one students with a significant academic advantage over their counterparts who attended half-day kindergarten. These results are supported by Fusaro’s (1997) meta-analysis of kindergarten research which found that “overall, students who attended full-day kindergarten manifested significantly greater achievement than half-day attendees.

Some debate does appear in the literature regarding who might best benefit from full-day kindergarten. Housden and Kam (1992) and Fromboluti (1988) both argue that a developmentally appropriate full-day kindergarten program benefits all children both academically and socially, but it is especially beneficial to children from low socioeconomic or educationally disadvantaged backgrounds.

Purpose of the Research

In Canada, presently, there are a variety of models being used for delivery of kindergarten curricula. School jurisdictions in most Canadian provinces and the territories make available to kindergarten age children a minimum of half-day programs. Quebec and New Brunswick both require school jurisdictions to offer kindergarten age children full-time, full-day programs. In Alberta, teacher-student contact ranges from four half-day sessions per week to two full day sessions per week to five full-day sessions per week. However, more often than not, Alberta schools offer kindergarten students 400 contact hours per year maximum, the maximum presently funded by Alberta Education. Standing out, in terms of the number of student-teacher contact hours, from other kindergarten programs in Alberta is the program offered at one inner city elementary school. This school, through the generosity of an anonymous benefactor, has been able to offer its Kindergarten students a full-day program with approximately 1000 instructional hours per year.

The present research was situated primarily with those studies focussing on the effects of time spent in face-to-face interaction in the kindergarten classroom. A secondary focus will be to describe (a) the full-day kindergarten program as it is delivered to students and (b) its pedagogical basis. The present study addressed the question: What are the actual and perceived effects of full-day Kindergarten on students' development in three foundational areas: (a) play and problem solving, (b) language and literacy, and (c) social-emotional growth through interaction with peers and teachers? Overall, this study provides a glimpse into the potential for full-day kindergarten in schools serving students from low socioeconomic or educationally deprived backgrounds.

Method

This research drew on two research methodologies – a Constructivist one and a Positivist one. This study made use of several data sources, including: (a) semi-structured interviews with kindergarten school staff, (b) anecdotal comments generated by the teacher throughout the year for student report cards, (c) quantitative data collected by the school for assessing student progress, and (d) quantitative data collected by a second school for assessing student progress in a half-day kindergarten program. The qualitative data served only to provide a context for the quantitative data. The analysis of the quantitative data conformed to the causal-comparative research approach (Gall, Borg, & Gall, 1996).

Respondent Group and Data Sources

The data for this study were collected in two ways from two schools which were of approximately the same size and served similar diverse inner city populations. Interview data were gathered through semi-structured interviews near the end of the 1998/99 school year with the full-day kindergarten teacher and her assistant at Fox Elementary School (a pseudonym). Interview data were also collected from the half-day kindergarten teacher – at Eagle Elementary School (a pseudonym) near the end of the 1998/99 school year.

All kindergarten student report cards, with all forms of identification removed, for students who attended full-day program for the entire year were collected and subjected to a qualitative thematic analysis. Student data collected using six of Clay's (1993) Observation Survey sub-tests comprised the quantitative portion of the study. Clay's Observation Survey sub-test data were collected by an ECS district consultant in February – pre-test data – and then again in June – post-test data – of

the 1998/99 school year at Fox Elementary School ($n = 16$) and at Eagle Elementary School ($n = 11$). Only data collected from students who were present for both the pre- and post-tests were analysed. Throughout the school year student enrolment in the two kindergarten programs ranged from a high of 21 to a low of 20 at Fox Elementary and from a high of 20 to a low of 14 at Eagle Elementary. Data collection procedures ensured that the number of instructional days elapsing between the gathering of pre-test and post-test data were approximately the same – within five percent – for the full-day and the half-day kindergarten programs.

Clay's Observation Survey

The Clay (1993) Observation Survey is an internationally recognized instrument for assessing the development of non-readers and emergent-readers. This survey places emphasis on the operations and strategies used by emergent readers to obtain messages from text and to place messages into text. The six Observation Survey sub-scales used in the present study were: (a) Letter Identification (split-half $r = 0.97$, validity–correlation with Word reading $r = 0.85$), (b) Concepts About Print (test-retest $r = 0.73$ to 0.95 , validity–correlation with Word reading $r = 0.79$), (c) Ready to Read Word Test (split-half $r = 0.90$, validity–correlation with Word reading $r = 0.90$), (d) Writing Vocabulary (split-half $r = 0.97$, validity–correlation with Word reading $r = 0.82$), (e) Hearing and Recording Sounds in Words (split-half $r = NA$, validity–correlation with Word reading $r = NA$), and (f) Book Reading Level (split-half $r = NA$, validity–correlation with Word reading $r = NA$).

The letter identification sub-scale of Clay's Observation Survey assesses the extent to which a reader recognizes upper and lower case letters in Times Roman and Century Gothic type fonts. Readers are presented with a single sheet containing (a) all of the letters of the alphabet in upper and lower case using a Times Roman font and (b) the lower case letters "c" and "g" in Century Gothic font. The reader is asked to read the letters, which are presented in random order, by the teacher or researcher. A reader who is unable to identify particular letters is asked one or more of a series of questions to help the child recall, these include: (a) Do you know its name? (b) What sound does it make? and (c) Do you know a word that starts like that?

Clay's concepts about print sub-scale assesses the extent to which emergent readers understand how Western languages are printed. The concepts that are assessed include identifying the front of the book; that print (not the picture) tells the story; that there are letters, and clusters of letters called words; that there are first letters and last letters in words; that you [sic] can choose upper or lower case letters; that spaces are there for a reason; and that different punctuation marks have meanings (fullstop, question mark, talking marks). (Clay, 1993, p. 47)

The Ready to Read Word test, as devised by Clay (1993), is "compiled from high frequency words in reading materials that are adopted" (p. 53) by the teacher for use in the classroom. This allows the assessment to be based on words which the child has had an opportunity to learn. In the present context, this test allows teachers and researchers to assess student knowledge of words which are consistent with learning objectives specified in the Alberta recommended curriculum for kindergarten. In Alberta, these words are consistent with the "primer" series of the Dolch Word List.

Clay's writing vocabulary sub-test enables teachers or researchers to systematically assess children's writing behaviour. Observation of writing vocabulary provides a good indication of

emergent readers' "knowledge of letter and of the left-to-right sequencing behaviour required to read English. Components of writing vocabulary which were examined include: (a) letter formation, (b) the variety of letter forms used, (c) the number of words which can be drawn upon from memory, and (d) the ability to correctly sequence letters to spell the words drawn upon from memory.

The hearing and recording sounds in words sub-test has the emergent reader record a dictated sentence. This dictation is then "scored by counting the child's representation of the sounds (phonemes) by letters (graphemes)" (Clay, 1993, p. 65), spelling is not assessed in this sub-test. The hearing and recording sounds in words sub-test assesses the extent to which emergent readers are able to: (a) hear the sounds entombed within words, (b) discriminate visually among symbols used in print, (c) sequence individual symbols and groups of symbols to represent sounds, and (d) identify "that there are many alternatives and exceptions in our system of putting sounds into print" (Clay, 1993, p. 65).

Emergent readers' book reading level is determined by a running record (or miscue analysis) of the child's reading of a series of levelled books. The child is considered to be reading at a particular level if he or she can read books from that level with 90 percent or higher rate of accuracy. Testing proceeds until a child reaches a "hard" level or a "frustration" level in which reading word accuracy diminishes to below 90 percent.

Data Analysis

The analysis of the semi-structured interviews were conducted through the use of narrative accounts to support emerging themes. Similarly, anecdotal comments in students' report cards were analysed for emergent themes—in particular, these data were scanned as they related to student academic and social growth. These data serve to provide a more complete picture of what the similarities and differences between the two kindergarten groups were.

Using Analysis of Covariance tests (ANCOVA) to adjust the quantitative post-test data for prior knowledge – the pre-test data – data collected from students in the full-day kindergarten program were compared with data collected from students in the half-day kindergarten program. Six univariate ANCOVAs corresponding to each of Clay's five Observation Survey sub-tests and the emergent readers' Book Reading Level were conducted to compare the two kindergarten programs.

The alpha level was set to 0.05 for all comparisons. Although a less conservative alpha level would have been appropriate (see Pedhazur, 1982), the more stringent level was used to reduce the possibility of a Type II error when making inferences back to the population.

Findings

School Contexts

Fox Elementary School. Fox Elementary School (a pseudonym) caters to slightly under 200 pupils of various ethnic backgrounds in kindergarten to grade six and is located in the inner city area of a large Western Canadian metropolitan area. Relative to other schools in the district, Fox Elementary serves a high socio-economic needs community – ranking among the top 5% of the neediest schools in the district. Fifty-three percent of households sending children to Fox Elementary School earned less than \$15,000 in 1991 (the most recent economic data collected by the District). Almost half of the

students attending Fox Elementary School have special needs designations. The demographic profile of the local community shows high proportions of single adult households and single males. Many individuals and families living in the school's catchment area are transient resulting in a high turn-over rate of the student population at Fox Elementary – ranging from 20% to 30% per year over the past 10 years.

All children at Fox Elementary School are provided with snacks and a hot lunch program. It is believed by all staff at this school that learning can only take place once this most basic need has been met.

The school has a literacy and numeracy emphasis as its mandate. Children in the kindergarten program are teamed with children from other grades in the school for the purpose of reading together. Eleven of the twenty-one kindergarten children at Fox Elementary School have also been paired with adult mentors who come into the school for approximately two hours per week. These mentors typically engage in activities which are literacy based. Kindergarten students were also assisted by an experienced half-time teacher assistant.

Activities in the Fox Elementary kindergarten program are thematically based. Activity centres are structured to reinforce the topics being addressed through “author studies.” The teacher has found that by integrating the various activities with the themes developed in the books read, “kids have really enjoyed getting to the literature...they’ve become really interested in books.”

It is noteworthy that the full-day kindergarten program at Fox Elementary School during the 1998/99 school year was made possible through a donation from an anonymous benefactor. This additional funding enabled the school to: (a) purchase manipulatives and age appropriate books, (b) hire a half-time teaching assistant, and (c) hire a kindergarten teacher to teach the kindergarten class full-time.

Eagle Elementary School. Eagle Elementary School (a pseudonym) caters to slightly under 225 pupils of various ethnic backgrounds in kindergarten to grade nine and is located in the inner city area of a large Western Canadian metropolitan area. It is the only school in its district running on a Year Round Modified time-table. Relative to other schools in the district, Eagle Elementary serves a high socio-economic needs community – ranking among the top 5% of the neediest schools in the district. Fifty-three percent of households sending children to Eagle Elementary School earned less than \$15,000 in 1991 (the most recent economic data collected by the District).

Approximately one-third of the students attending Eagle Elementary School have special needs designations. Eagle Elementary is also a district site for “opportunity” children at the primary, elementary, and junior high school levels. It is also a district site for “adaptation” students at the junior high school level. The demographic profile of the local community shows high proportions of single adult households and single males. Many individuals and families living in the school's catchment area are transient resulting in a high turn-over rate of the student population at Eagle Elementary school – ranging as high as 160% during the 1997/98 school year. Child welfare and city police service data indicate that “the immediate area has the highest number of referrals and incidents in the city.”

The school also provides its students with a “hot lunch” program. Kindergarten students are provided with a snack since they are only in the school for the morning. As was the case at Fox

Elementary, it is believed at Eagle Elementary school that children cannot learn until their hunger has been addressed.

The school's philosophy states:

We believe that all children can and will learn given the right conditions, and that those conditions must include a safe, nurturing and caring learning environment. We believe that each child is an individual and programming should reflect those individual needs. We believe that all children can develop responsible citizenship through values based character education. Furthermore, the school has also mandated a focus on early literacy for its students. Children in the kindergarten program are paired with children from another elementary level class for individualized reading. A second school focus for all children at Eagle Elementary school, including those in kindergarten, is "Character Education." Character education is described as a means of using literature to encourage the development of positive character traits in children.

Activities in the Eagle Elementary kindergarten program are thematically based and support "balanced literacy." Activity centres are structured to reinforce the themes being addressed. Themes are selected around areas that the teacher is excited about and the "the children may not have a lot of experience with to impart a sense of excitement and curiosity."

The Teachers

The teachers at both Fox Elementary and Eagle Elementary were remarkably similar in terms of experience – both professional and personal – and beliefs about how best to teach children. When asked about what they perceived to be the effects of their kindergarten programs on the children in the areas of play, problem solving, social growth, and emotional growth, both responded in remarkably similar ways. To monitor student growth both teachers indicated that they use ongoing observation and checklists corresponding to the Alberta Education recommended kindergarten curriculum. Anecdotal comments from their observations and examples of students' work are kept in student portfolios by both teachers.

The Fox Elementary teacher. Cathy (a pseudonym) had just started teaching at Fox Elementary school in the 1998/99 school year. At the time of the interview, she had taught for a total of 11 years, all within the same district. Ten of those years had been spent at one other elementary school teaching kindergarten. Cathy did have a brief hiatus from teaching when her daughter was born a few years ago. She has considerable experience with young children at both professional and a personal levels. Cathy was brought to Fox Elementary by the principal because, as the principal stated, "she is one of the best kindergarten teachers I have ever seen!"

Cathy's educational background includes a Bachelor of Education degree in Elementary Education from the University of Alberta. Over the years since she obtained her undergraduate degree, Cathy has been actively involved in ongoing professional development engaging in numerous summer institutes and workshops directed at such topics as cooperative learning, literacy and reading, animated literacy, and computers in the classroom.

Cathy believes that children need to learn through play with other children. She uses play activities to teach literacy, numeracy, and socialization skills. Cathy felt that:

through play, they learn how to solve problems, they develop their language and as they learn how to problem solve and develop their language, their social and emotional growth happens –

they're dealing with others. They're not sitting down at a table doing stuff by themselves...all alone. I think play is the most important part...that's how we get them doing everything else. Self confidence is built when children have opportunities to develop relationships with adults and with peers who care about them. Self confidence is further bolstered through the development of literacy skills.

The Eagle Elementary teacher. Lois (a pseudonym) had taught at Eagle Elementary school for three years. At the time of the interview, she had taught for a total of 10 years, the last 4 in the present district teaching at the kindergarten level. The first six years of her teaching career Lois taught grades two and three. Prior to working for her present district, Lois had an eight year hiatus from teaching to raise her young family. During the last four years of her stay at home with her family, Lois taught "play school" two mornings per week. Lois has considerable experience with young children at both professional and a personal levels. Lois was described by her principal as "outstanding, I wish we could clone her!"

Lois's educational background includes a Bachelor of Education degree in Elementary Education with two majors -- English reading and movement education -- from the University of Alberta. Over the years since she obtained her undergraduate degree, Lois has been actively involved in ongoing professional development. Most recently Lois has participated in numerous workshops focusing on kindergarten level issues. These have addressed topics such as literacy, math, social studies, conflict resolution, music, physical education, and special needs.

Lois believes that children need to learn through play with other children--it is a socialization process. Appropriate social skills are seen as fundamental for learning to take place. Such traits as respect, honesty, and kindness are seen as fundamental for learning to take place "not only scholastically"... "but we're building a whole person." Lois stated that as she works with children, she strives to "build a positive self concept by reaching each child on an individual basis, provide each child with a safe and secure school environment." She also stated that "most importantly, I want children to achieve a love of learning."

Teacher Observations of Student Growth at Fox Elementary

The analysis of the interview with Cathy and of her pupils' report cards provide remarkable insights into the development of the young children enrolled in the full-day kindergarten program. As someone who had taught half-day kindergarten classes for ten years, Cathy had some very strong beliefs, and experiences on which to base those beliefs, about the potential of teaching kindergarten pupils in a full-day format.

When asked to compare her past experiences teaching half-day kindergarten with the full-day kindergarten she taught during the 1998/99 school year, Cathy very excitedly said:

Well, I see these kids have come a lot further than other classes that I've worked with in half-day programs. That's the biggest difference that I see because it's what I have to compare to. These kids have come a long way, despite it being more inner city than where I was working before. I see these kids as coming farther. I've got a table of kids that are either reading or just "right there."

I've always had one or two that are reading at the end of the year but never like this. And the kids are really interested in the print. And socially they've come further, they've become a very

close knit group spending the time together.

It's a matter of devoting more time...because of course, you could use many of the activities, if not all, in a half-day program as well. I would imagine that this is what most every kindergarten teacher is doing. But I've got a full day to do it. I can fit just that much more in. I can't believe what a difference it's made. I didn't think at the beginning of the year that it would be this much!

Cathy's observations of how much growth her pupils have experienced come in spite of recognising that many of these children come from educationally disadvantaged homes. In describing the sorts of manipulatives she has introduced to her class, Cathy stated:

A lot of these kids have not played with a lot of these things, board games, puzzles, even the simple puzzles – the wooden ones with the knobs that they just have to lift out and put back in. A lot of these kids have never played with those and there very easy. You know they're more for a two year old or a three year old but these kids haven't had access to those. It's so important that they get to play with things like that...to experience those things.

An examination of the kindergarten class's report cards for those pupils who had been in the full-day kindergarten program since the beginning of the 1998/99 school year showed phenomenal growth. This is not to suggest that pupils in the half-day program did not also exhibit a great deal of growth. The purpose here is to provide a picture of how the full-day kindergarten pupils progressed over the period of one school year in the areas of: (a) personal and social responsibility, (b) community and environmental awareness, (c) physical skills and well-being, (d) creative and cultural expression, (e) language arts, and (f) mathematics. As such, the excerpts from pupil report cards represent the achievements of the majority of pupils throughout the school year and not the achievements of the outstanding pupils in any area. This was done to give the reader a sense of the progress exhibited by the full-day kindergarten class as a whole. It should also be noted here that *all* pupils were deemed, by the end of the school year, to be academically, socially, and emotionally ready to be advanced to grade one.

Personal and social responsibility. At the kindergarten level during the first two-and-a-half months of school, learner expectations in the area of personal and social responsibility included having the learner: (a) perceive himself or herself as capable of learning, (b) demonstrate curiosity in learning, (c) take responsibility in selecting and learning activities, (d) accept some responsibility for tasks at school, (e) follow rules and routines in familiar places, (f) follow the teacher's directions, (g) get to destinations within the school, (h) separate from parents or guardians willingly, (i) show respect for others, (j) listen to peers and adults, (k) take turns in activities and discussions, and (l) join in large group activities. By the end of this reporting period, the majority of students had demonstrated meeting many, if not all, of the objectives listed above. The following teacher comment is typical of many students:

Jake (a pseudonym) is adjusting well to our class routines. He has come a long way in a very short period of time. He was so shy when he first started in our class, but...he has opened up completely! He has no trouble making friends.... During group time Jake is developing listening skills and requires few reminder to be a polite listener now that he is sitting at the front of the class. He eagerly participates in class discussions and contributes ideas and

opinions. Jake actively participates in centre time and most often can be found completing self-directed activities....

At mid-year full-day kindergarten pupils are also expected to be able to: (a) learn about conflict resolution, (b) complete some self-directed activities, (c) participate actively in learning tasks, (d) work well with others, (e) try new activities, (f) show control over emotions, (g) be responsible for personal belongings, (h) return the daily agenda book, and (i) identify personal likes and dislikes. Jake, in similar ways to the rest of his classmates, continued to show growth by mid-year.

Jake demonstrates an eagerness to be in school.... Jake completes all of the tasks he starts and is serious when working. Jake's self confidence is improving and he is becoming more involved in class discussions and will raise his hand to answer questions. I am pleased to see his progress in this area as he was extremely shy in class at the beginning of the year. The one small problem that seems to have developed is that he has made so many new friends that he sometimes gets into trouble for talking when he should be listening. Jake enjoys trying new activities and works well with other children he might be put into a group with. Jake always returns his agenda and I notice the extra work that is in it. Thank you so much for your support at home.

By the end of the school year, pupil objectives in the area of personal and social responsibility had grown to include: (a) taking responsibility for completing tasks, (b) showing respect for self and for others, (c) willingness to take risks, and (d) working cooperatively. Jake's report card now declared:

Jake has become much more mature throughout this year.... He has learned to work cooperatively and has become more responsible. Jake has always...completed work given to him carefully. He is still apprehensive about taking risks in his work as he really does not like to take the chance of making a mistake. Jake participates actively in learning tasks and show respect for others. He knows and follow the school rules. Jake is faithful with remembering to return his agenda book every day.

Community and environmental awareness. By the end of the first reporting period, kindergarten pupils at Fox Elementary school were expected to achieve six objectives related to community and environmental awareness, namely the ability to: (a) recognise special places within the environment, (b) describe a variety of homes, (c) recognise people who help in the community, (d) describe some ways that people and goods are transported, (e) role play familiar situations (e.g., store, house, restaurant, post office), and (f) identify colours in the environment. Lynn's (a pseudonym) first term report card is typical of her classmates' achievements:

Lynn enjoys learning about the community she lives in and can identify a variety of people who help in our community. Lynn has a lot of fun role playing different members of our community during centre time when she can dress up in "career" clothes. She has learned that there are a variety of ways people can travel and goods can be transported: by land, by air, and by boat. Lynn can identify colours in the environment.

By the second reporting period (near the middle of the school year), pupils are expected to meet seven additional goals related to community and environmental awareness: (a) participate in activities to learn about the winter environment (b) explore the five senses by participating in activities and

playing at the science centre, (c) ask questions about the environment, (d) develop and awareness of the importance of protecting the environment, (e) show awareness of how people look after each other, (f) use computers in the classroom appropriately, and (g) identify likes and dislikes as they relate to the environment. Lynn's mid-year report card stated:

Lynn is curious about the community she lives in and about the environment around her. Lynn eagerly participates in activities that help her t learn more. She has had the most fun learning about our five senses. She plays at the science centre to learn more about them. During centre time she spends a lot of time at the house centre where she enjoys taking care of the needs of the "babies" (i.e., dolls). Lynn is able to identify likes and dislikes in a mature manner. She is able to use the computers in the classroom appropriately and can share the time on them with others.

In addition to the goals specified above, by June of 1999 the kindergarten pupils were expected to be able to: (a) learn about the spring and summer environment, (b) learn about life cycles of some animals, (c) show awareness of the three "R's" (i.e., reduce, reuse, recycles), and (d) be able to match object as being the same or going together. Again, Lynn's report card comments in this area were typical of many of her classmates:

Lynn enjoys learning about the environment and the community she lives in. She has been intrigued by the observations she has done on life cycles. She asks many questions about why and how things happen. Lynn has learned more about caring for others by role playing in the centres room. She has also learned about caring for the environment this term. Lynn is able to match objects as being the same or going together. She uses the computers in the room appropriately.

Physical skills and well-being. Four goals were expected to be achieved by kindergarten pupils attending Fox Elementary by the middle of the Fall term, namely to: (a) develop gross motor skills through activities that exercise the body, (b) move from place to place using different pathways, (c) know and observe safety rules, and (d) participate appropriately in physical activity. The enthusiasm displayed by Matt (a pseudonym) is also typical of his classmates:

Matt has fun participating in many gross motor skill activities that exercise his body. We have focussed on cooperatives games and Matt has been a successful and eager participant. He observes safety rules and knows why they are necessary to have. Matt enjoys moving in different ways and is enthusiastic during physical education.

By the middle of the school year, in terms of physical skills and well-being, pupils are expected to be able to also: (a) develop fine motor skills, (b) develop spatial awareness, (c) learn to make healthy food choices, (d) independently dress himself or herself, and (e) develop a sense of balance. Matt's development continues to be typical in many ways of his peers:

Matt's gross motor skills are being developed in gym and outside on the playground. He knows and follows the safety rules in both of these areas. I know that he will look out for others around him and help others if they are hurt. Matt is learning about the four food groups and which foods are necessary to keep our bodies healthy. Matt can dress himself independently and take care of his personal belongings. I appreciate this during cold weather when there is a lot of outdoor clothing to put on and put away. Matt's fine motor skills are improving nicely as well.

Two additional goals were expected to be achieved by pupils with respect to physical skills and well-being by the end of the school year. These were: (a) demonstrating good sportsmanship, and (b) participating in the personal safety program. Matt's growth throughout the year in this area continues to be typical of his peers:

Matt's gross and fine motor skills have progressed nicely this year. He enjoys learning new games and practising new skills. He observes the safety rules and participates appropriately. Matt also display good sportsmanship. Matt continues to learn about making healthy food choices and has participated in the personal safety program.

Creative and cultural expression. By the end of the first reporting period, kindergarten pupils at Fox Elementary school were expected to achieve four objectives related to creative and cultural expression, namely the ability to: (a) participate in action verses, songs and poems; (b) explore and experiment with patterns, movements, and music; (c) be creative; and (d) use instruments appropriately. Cheryl (a pseudonym) is also typical of her peers in this area. Her first report reads:

Cheryl enjoys participating in action songs and poems. Cheryl is learning to use her imagination and is happy when singing. She is learning to use instruments appropriately and enjoys experimenting with sounds. Cheryl is starting to draw more now and particularly has fun drawing with her friends. She has made some pictures of special times in our class.

By the second reporting period, pupils were expected to meet four additional goals related to creative and cultural expression: (a) learn to express themselves in art, music, and drama; (b) use art materials appropriately; (c) enjoy participating in art; and (d) recognise that different cultures have celebrations. The comments in Cheryl's mid-year report are, again, quite typical of those her classmates received:

Cheryl is able to express herself in art, music, and drama. She loves to learn new songs and poems. She is developing her imagination and her skills in art. Cheryl is also learning about different cultures in kindergarten.

By the end of the school year, pupil objectives in the area of creative and cultural expression remained the same as for the previous reporting periods, however, pupils were expected to show further growth with respect to all goals. Cheryl's final report card comments state:

Cheryl has had a lot of fun learning in this area of the kindergarten program. She enjoys herself when participating in art, music, and drama. She loves action songs and using her imagination. During these activities, she is able to move about and does so appropriately. Cheryl enjoys art and uses materials appropriately. Sometimes she has to be reminded to clean up after herself. Cheryl is becoming aware of different cultural traditions this year.

Language arts. At the kindergarten level during the first two-and-a-half months of school, learner expectations in the area of language arts included having the learner: (a) engage in reading behaviours, (b) listen to stories for enjoyment and information, (c) share favourite books, (d) recognize what a story is, (e) experiment with pictures and letters to represent ideas, (f) recall events in a story, (g) begin to recognize that illustrations indicate what is to come, (h) begin to contribute ideas and opinions to discussions, and (i) begin to share personal responses. Tami's (a pseudonym) growth during the first reporting period with respect to the objectives set out in language arts is quite typical of the majority of her peers.

Tami enjoys stories, poems, and chants that we do as a class. She is learning the direction of print and enjoys practising being the teacher where she can use the pointer on the word charts. Tami enjoys looking at books and is learning that pictures help to tell what is happening in a story. She can also recall the events in a story. She willingly shares favourite books with her friends. Tami is learning that drawing pictures can convey a message. She prints her name with no problem. I am so glad that Tami participates in our home reading program.

At mid-year, in language arts, full-day kindergarten pupils are also expected to be able to: (a) learn the letters of the alphabet; (b) relate personal experiences; (c) use pictures as clues to re-tell a story; (d) share favourite stories, books, and poems with the class; (e) record experiences (e.g., pictures, writing); (f) attempt to match flow of language to print; (g) predicts what might happen next in a story; (h) develop an appreciation for authors studied; (i) participate in the home reading program; and (j) use the computer to expand knowledge. Tami's progress, once again, is typical of her class:

Tami is progressing very well in language arts. She can identify the letters of the alphabet and is learning the sounds that the letters represent. She is also able to sound out words and put the corresponding letters down on paper. She is learning about print and knows that words are groups of letters with spaces in between. Tami is eager to read and enjoys retelling stories that she is familiar with. She uses pictures as clues to tell what is happening in a story and to predict what may happen next. Tami has enjoyed our author studies and is able to identify favourite books by these authors. Tami enjoys using the computer to learn more about language arts. Tami is a faithful participant in the school wide home reading program. Thank you for showing Tami that reading is important.

In addition to the goals specified above, by June of 1999 the kindergarten pupils, in language arts, were also expected to be able to: (a) participate in the morning message (e.g., complete a message missing letters and punctuation); and (b) identify the beginning, middle, and the end of a story. Again, Tami was not outstanding in her class, but it was clear that she met most of the goals set out:

Tami's language arts skills have improved immensely over this last year. She has got a list of sight words and is learning to read. Tami contributes thoughtfully to class discussions. She enjoys sharing favourite stories with others and can retell favourite stories using picture cues. Tami loves to record experiences using pictures and is adding a lot of print to the pictures now as well. Tami is my most vocal participant in the morning message activity. She has learned much about reading by getting so involved in the activity. Tami is able to predict what may happen next in a story and is learning to identify the beginning, middle, and the end of a story. Tami loves author studies and particularly enjoyed Jan Brett. Tami participates in the home reading program. Thank you for your support. She uses the computers to further her language learning.

Mathematics. Five goals were expected to be achieved by kindergarten pupils attending Fox Elementary by the middle of the Fall term, namely to: (a) use manipulatives to identify, reproduce, create, and extend a pattern; (b) sort objects into sets according to attributes; (c) count the number of objects in a set; (d) create sets using manipulatives making the connection with spoken and written terms; and (e) recognize the written symbols for numbers. Vance (a pseudonym) was a child who was not initially enthralled by mathematics concepts, in mathematics his first report card was somewhat

discouraging relative to his peers:

Vance requires encouragement to participate in math related activities. He is learning to make patterns. Vance can sort object in the environment in group by attributes (i.e., shape, colour, and size). He is learning to count and recognize number. He needs a lot of help counting objects to match a number. Please help Vance at home counting from 1 to 20.

By the second reporting period, pupils were expected to meet ten additional goals related to mathematics: (a) demonstrate counting ability, (b) identify numbers, (c) identify shapes in the environment, (d) show an awareness that purchasing involves the exchange of money for goods and services, (e) begins to compare lengths and begins to measure using non-standard units of measurement, (f) participate in problem solving activities, (g) participate in simple addition and subtraction activities using manipulatives, (h) can verbally discuss temperature, (i) use the computer to learn math concepts, and (j) is learning about graphs. By this reporting period Vance was no longer experiencing the difficulties he had had initially. Vance was now much more typical of his kindergarten peers.

Vance enjoys math activities and has learned to identify numbers and count by playing games with others. Vance is able to sort objects into groups and is able to create a simple pattern. Vance enjoys playing at the store centre and is learning that purchasing involves the exchange of money for goods. He is learning about the terms “hotter than” and “colder than.” He is also learning about measurement by completing simple measurement activities. Vance enjoys the simple addition and subtraction problems we do as a class using manipulatives. Vance also has fun learning more about mathematics while playing on the computers in the room. I encourage you to help Vance at home with number recognition and counting.

Two additional goals were expected to be achieved by pupils with respect to mathematics by the end of the school year. These were: (a) to learn the concepts of “greater than” and “less than,” and (b) to learn to interpret a simple graph. At the end of the school year, Vance’s report card now indicated that:

Vance enjoys math. He is able to count to 60 and recognizes most number to 30. Vance can identify shapes, sort objects into groups and interpret a simple graph. Vance enjoys addition and subtraction activities using manipulatives. He had fun playing the “Pac Man” game to learn about the concepts of “more than” and “less than.” Vance is able to discuss temperature verbally and enjoys problem solving activities. Vance uses the computer to further his learning in mathematics.

Quantitative Comparisons of the Full-day and Half-day Programs

Data from the full-day kindergarten program at Fox Elementary School and the half-day kindergarten program at Eagle Elementary School – the independent variable – were compared using six ANCOVAs corresponding to each of Clay’s (1993) Observation Sub-Scales and Clay’s composite scale: (a) Letter Identification, (b) Concepts About Print, (c) Word Tests, (d) Writing Vocabulary, (e) Hearing and Recording Sounds in Words, and (f) Book Reading Level. Post-test data – the dependent variable – collected from students in both kindergarten classes in June of 1999 were adjusted using the pre-test data – the covariate – collected in February of 1999 to adjust for differences in children’s prior literacy abilities. Means and standard deviations on the six Clay’s sub-tests for the pre- and post-test data collected from the full-day and the half-day kindergarten program pupils are shown in table 1.

With the exception of the Running Records of Reading sub-test, all data appear normal and free of outliers. On each post-test item shown in table 1, we conducted ANCOVAs to determine if differences existed between the full-day and the half-day programs after adjusting for prior knowledge.

Table 1. Clay's Observation Sub-scales Pre-test and post-test data for full-day and half-day kindergarten

Clay's Observational Sub-scale	Group Composition			
	Full-day Kindergarten Fox Elementary		Half-day Kindergarten Eagle Elementary	
	<i>M</i>	<i>(SD)</i>	<i>M</i>	<i>(SD)</i>
Pre-test observations (covariate)				
Letter identification	39.88	14.4	36.09	18.02
Concepts about print	12.06	2.86	12.18	4.26
Ready to Read Word test	1.63	3.07	1.36	2.91
Writing	3.5	2.48	3.45	4.23
Hearing & recording sounds in words	9.56	10.16	10.27	8.96
Book Reading Level	0.38	0.72	0.36	1.21
Post-test observations				
Letter identification	50.38	3.32	43.45	13.72
Concepts about print	17.75	3.36	14.91	3.94
Ready to Read Word test	6.88	5.24	1.82	4.45
Writing	12.06	8.71	7.91	7.26
Hearing & recording sounds in words	21.25	11.29	15.82	10.55
Book Reading Level	1.94	3.91	1.91	5.36

Letter identification. After taking into account students' prior letter recognition abilities, significant differences ($\alpha = 0.05$) were found to exist between the full-day kindergarten program at Fox Elementary school and the half-day kindergarten program at Eagle Elementary school ($F_{1,24} = 5.511, p = 0.027$). Table 2 provides the analysis of covariance table for this comparison.

Table 2. ANCOVA comparing full-day and half-day kindergarten on letter identification.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, letter ID	1423.894	1	1423.894	44.856	0
Main Effects – School	174.934	1	174.934	5.511	0.027
Residual	761.84	24	31.743		
Total	2360.667	26	90.795		

Concepts about print. After taking into account students' prior concepts about print abilities, significant differences ($\alpha = 0.05$) were found to exist between the full-day kindergarten program at Fox Elementary school and the half-day kindergarten program at Eagle Elementary school ($F_{1,24} = 11.961$, $p = 0.002$). Table 3 provides the analysis of covariance table for this comparison.

Table 3. ANCOVA comparing full-day and half-day kindergarten on concepts about print.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, concepts about print	207.153	1	207.153	43.985	0
Main Effects – School	56.334	1	56.334	11.961	0.002
Residual	113.032	24	4.71		
Total	376.519	26	14.481		

Ready to Read Word test. After taking into account students' prior word reading abilities, significant differences ($\alpha = 0.05$) were found to exist between the full-day kindergarten program at Fox Elementary school and the half-day kindergarten program at Eagle Elementary school ($F_{1,24} = 10.399$, $p = 0.004$). Table 4 provides the analysis of covariance table for this comparison.

Table 4. ANCOVA comparing full-day and half-day kindergarten on the Ready to Read Word test.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, Ready to Read Word test	285.866	1	285.866	20.06	0
Main Effects – School	148.193	1	148.193	10.399	0.004
Residual	342.015	24	14.251		
Total	776.074	26	29.849		

Writing. After taking into account students' prior writing abilities, non-significant differences ($\alpha = 0.05$) were found to exist between the full-day kindergarten program at Fox Elementary school and the half-day kindergarten program at Eagle Elementary school ($F_{1,24} = 2.830$, $p = 0.105$). Table 5 provides the analysis of covariance table for this comparison.

Table 5. ANCOVA comparing full-day and half-day kindergarten on writing.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, writing	748.564	1	748.564	19.542	0
Main Effects – School	108.4	1	108.4	2.83	0.105
Residual	919.333	24	38.306		
Total	1776.296	26	68.319		

Hearing and recording sounds in words. After taking into account students' prior abilities for hearing and recording sounds in words, significant differences ($\alpha = 0.05$) were found to exist between the full-day kindergarten program at Fox Elementary school and the half-day kindergarten program at Eagle Elementary school ($F_{1,24} = 5.044$, $p = 0.034$). Table 6 provides the analysis of covariance table for this comparison.

Table 6. ANCOVA comparing full-day and half-day kindergarten on hearing and recording sounds in words.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, hearing & recording sounds in words	1836.85	1	1836.85	38.655	0
Main Effects – School	239.661	1	239.661	5.044	0.034
Residual	1140.451	24	47.519		
Total	3216.963	26	123.729		

Book Reading Level. After taking into account students' prior book reading abilities, non-significant differences ($\alpha = 0.05$) were found to exist between the full-day kindergarten program at Fox Elementary school and the half-day kindergarten program at Eagle Elementary school ($F_{1,24} = 0.001$, $p = 0.982$). Table 7 provides the analysis of covariance table for this comparison.

Table 7. ANCOVA comparing full-day and half-day kindergarten on book reading level.

Source of Variation	Sum of Squares	DF	Mean Square	F-ratio	Signif of F
Covariate – pre-test, book reading level	402.569	1	402.569	85.29	0
Main Effects – School	0.003	1	0.003	0.001	0.982
Residual	113.28	24	4.72		
Total	515.852	26	19.84		

Discussion

In this preliminary investigation we explored the perceived and actual effects of full-day kindergarten. It was clear that both the half-day and the full-day kindergarten programs were generally in keeping with the six principles exhibited by exemplary programs (Corter & Park, 1993). Instruction in both programs was approached from a play-based child-centred philosophy. It was clear from the teacher interviews and the comments in the pupil report cards that instruction in both programs

focussed not only on academics, but on the development of the whole child – socially, emotionally, and academically. Instruction in both programs emphasized the role of the learner in his or her social context. Pupils were sensitized regarding how they fit into their social and physical world. School administration at both Fox and Eagle Elementary schools were extremely supportive of their kindergarten programs. Both principals were sure that they had “outstanding” kindergarten teachers in their programs. Given the inner city settings of both schools, parental support for pupil learning in the home was not exemplary. It is not known if interest groups at either of the two schools have worked toward providing structured and balanced kindergarten programs as this issue was beyond the scope of the present investigation. We suspect that since both teachers were of the highest calibre and both were following the recommended Alberta curriculum of studies for kindergarten that the programs were both structured and balanced to best meet the needs of their pupils. Corter and Park’s (1993) sixth principle exhibited by exemplary kindergarten programs is the only one in which we suspect existed a large discrepancy between the full-day and the half-day kindergarten programs. In addition to the support provided generally by schools and society to all kindergarten programs, Fox Elementary School had the distinct advantage of the support an anonymous benefactor who not only made the full-day kindergarten program possible, but also provided sufficient resources for the school to obtain additional manipulatives and age appropriate books.

Interview and Report Card Data: Fox Elementary

After qualitatively examining pupil report cards from the beginning, middle, and the end of the school year for children attending the full-day kindergarten program at Fox Elementary School, we found that all pupils had experienced substantial growth in the areas of (a) play and problem solving, (b) language and literacy, and (c) social-emotional growth through interaction with their peers and their teacher and teacher assistant. Pupil growth as recorded in their report cards addressed these three broad areas under the headings of (a) personal and social responsibility, (b) community and environmental awareness, (c) physical skills and well-being, (d) creative and cultural expression, (e) language arts, and (f) mathematics. Comparing her present class of pupils with other kindergarten pupils she had taught over a period of ten years, Cathy attributed her extremely high rate of success to the increased amount of time she spent with pupils in the full-day program. In her opinion, as a very experienced kindergarten teacher, the majority of her pupils were either already reading or on the verge of reading independently.

This *is not* to imply that pupils attending Eagle Elementary did not experience growth in these areas also. Indeed, we are certain that the pupils attending the half-day kindergarten program at Eagle Elementary School also grew in these three areas. It was not the purpose of this study, however, to collect quantitative, comparative data to be able to compare the sub-groups in terms of pupil growth in the areas of (a) play and problem solving and (b) social-emotional growth through interaction with peers and teachers.

Clay’s Observation Survey Data: Fox and Eagle Elementary

In terms of growth in language and literacy, the findings of the present study are consistent with the literature (e.g., Alber-Kelsay, 1998; Ohio State Legislative Office of Education Oversight, 1997). It was clear that pupils in the full-day kindergarten program performed significantly better, after taking into account previous ability, on all but one of Clay’s Observation Sub-tests: (a) letter identification, (b) concepts about print, (c) readiness to read word test, and (d) hearing and recording sounds in

words. And, although non-significant ($\alpha = 0.05$), after taking into account students' prior writing abilities, results from Clay's writing sub-test ($F_{1,24} = 2.830$, $p = 0.105$) suggest that it is possible that students in the full-day kindergarten program might be better able to write by the end of the school year than their counter-parts in the half-day program. Such differences, if they exist, can only be detected by increasing the sensitivity of the research approach.

It is paradoxical, given the significant differences found on four of Clay's observational sub-tests, that the inferential test (ANCOVA) performed on Clay's Book Reading Level should be non-significant. In other words, actual reading ability of pupils could not be attributed to differences between being in a full-day kindergarten program and being in a half-day kindergarten program. In fact, the only predictor of reading ability by the end of the school year was prior pupil reading ability. At least two scenarios can explain this discrepancy. First, it is possible that the short time frame during which the pre- and the post-test data were collected reduced the sensitivity of the study to detect differences even though they may exist. Or second, it is possible that many of the students participating in this study were simply not developmentally ready to combine all of the skills they have acquired, which are necessary precursors for reading, to be able to read unassisted by the end of kindergarten.

Conclusions and Recommendations

Five conclusions present themselves from the findings obtained in this study. From these conclusions emerge five recommendations for further research and policy.

1. Children in the full-day kindergarten program experienced significantly greater growth in the pre-requisite skills for reading than did children in the half-day kindergarten program. This is particularly true in terms of the development of skills enabling pupils to (a) identify letters of the alphabet, (b) develop understandings of the conventions regarding printed language, (c) assemble a repertoire of words necessary to become readers, and (d) move from oral language to printed language by being able to recording sounds using letters.
2. The sensitivity to detect differences existing between full-day and half-day kindergarten programs needs to be increased. This should be addressed by (a) increasing the sample size and (b) increasing the length of time over which data are collected.
3. In keeping with the literature and the anecdotal evidence gathered in this research, it appears that using "play" as the basis for delivering instruction to kindergarten students is highly effective.
4. The full-day kindergarten experience may be most beneficial for pupils of low socioeconomic or educationally disadvantaged backgrounds since the teacher may then take on the role of providing necessary experiences to socialize and educate pupils that may not be available in the home environment.
5. The funding provided by Fox Elementary School's benefactor was essential in establishing a full-day kindergarten program – without this funding, the full-day program would not have existed. The additional funding was necessary for (a) purchasing various resource materials and

equipment for the classroom, (b) hiring a half-time teaching assistant, and (c) topping off the teacher's salary to enable her to be in the classroom on a full-time basis.

Given the five conclusions above we recommend that:

1. To overcome many of the issues of validity of the present research, a study enquiring into the differences between full-day kindergarten and half-day kindergarten should be implemented over the course of an entire school year using an experimental design with a minimum of 30 schools located within the province of Alberta. This will also provide a much needed data to ascertain the applicability of American and International research literature in the Alberta context.
2. Further research investigating student growth during their kindergarten year should make use of data collected before the end of the first month of the school year to establish a base-line for comparing end-of-year growth data collected during the final month of the school year.
3. A second study should be put into place to study the long term effects of full-day kindergarten. Such a study should follow pupils who have participated in full-day kindergarten through to the end of their elementary school experience. The main difficulty that will need to be overcome in conducting such a study is that the pupils who likely will benefit the most from the experience of full-day kindergarten tend to belong to families have high levels of transiency.
4. The means for delivering instruction in kindergarten should continue to be "play based" (see Corter & Park, 1993). Pupils need to continue to learn in ways which fit with the manner in which children learn naturally. Play is the means by which children learn about the world around themselves, this needs to continue to be the focus of learning in kindergarten programs.
5. Full-day kindergarten should be made available immediately in schools serving pupils coming from predominately low socioeconomic or educationally disadvantaged backgrounds. It appears that pupils coming from these sorts of social or economic conditions have the most to gain in order to be prepared to learn to read. Although the findings from the study reported on in this paper are not conclusive, they are sufficient – given the gains in the development of students' abilities to (a) identify letters of the alphabet, (b) understanding the conventions regarding printed language, (c) assemble a repertoire of words necessary to become readers, and (d) move from oral language to printed language by being able to recording sounds using letters – to suggest that time is of the essence if as a society we are to provide children with the best possible opportunities for success.
6. Because education is a concern of our entire society, we should – as a society – take responsibility for funding full-day kindergarten programs, particularly for schools serving socially and educationally disadvantaged communities. At Fox Elementary School this role was taken on during the 1998/99 school year by an anonymous benefactor, other high needs schools have not been so lucky. The element of luck should not be the deciding factor in whether full-day kindergarten funding is provided to a school in need – the Government of Alberta should examine possible means for providing additional funding to schools for the implementation of

full-day kindergarten programs.

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Organization/Address: Univ. of Alberta	Telephone: 780-492-5868	FAX: 780-492-2024
	E-Mail Address: Jose.da.Costa@ualberta.ca	Date: 04/27/80

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