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Kindergarten Teachers' Philosophies and Computer Use

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KINDERGARTEN TEACHERS' PHILOSOPHIES AND COMPUTER USE

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CHAPTER I

INTRODUCTION

Change and transition are words often heard and associated with the decade of the 1980's. John Naisbitt (1970) forecasted ten major changes in his book, Megatrends. The first chapter of that book predicted the movement in America from an industrial to an informational society. Innovations in communications and computer technology have accelerated this movement. A key point in that chapter described how the educational system was turning out an inferior product for an informational society in terms of basic reading and writing skills. Response to criticism of this kind has been to change school curriculum.

One area of the school curriculum that has been changing in the 1980's is computer education. Critics such as Naisbitt, as well as other influences, have caused educators to focus on appropriate computer education in elementary schools. The emphasis here has changed from using computers for drill and practice activities to incorporating them as an integral part of the teaching strategy.

Practices in the Omaha Public School system have reflected this change of focus. In 1985 the Department of

Instructional Services listed 13 outcomes in computer studies for grades K-6. During the fall of 1987 many teachers completed a language arts inservice activity to learn how to relate computer software to the recently adopted language arts outcomes for their grade level. A committee also worked during the 1987-88 school year to prepare a similar list of software for mathematics, with an emphasis on problem solving.

Many of the teaching strategies presented in the language arts inservice activity for kindergarten and first grade were teacher-directed. Some experts feel teacher-directed activities are essential to academically oriented curriculums. This kind of curriculum has been the focus of change within the past few years, specifically at the kindergarten level. Early childhood specialists have opposed such academically oriented curriculums in favor of child-centered, developmentally based programs. These experts maintain that such programs are less stressful to young children who learn differently than do their older counterparts.

Practices within the Omaha Public Schools have also reflected this change in focus. At the fall conference in 1986 the topic for kindergarten teachers was "Play versus Academics" presented by Dr. Joyce Buckner, Director of Elementary Education. At that time Dr. Buckner shared research she had been doing in preparation for implementing

a kindergarten curriculum in 1987. The Department of Instruction distributed suggested schedules for kindergarten that included one hour of activity time each day, thus reducing the time for teacher-directed activities.

The focus of this study encompasses both the issue of the changing kindergarten curriculum and the impact of computers within that curriculum.

Statement of Problem and Its Significance

The purpose of this study was to assess Omaha Public School kindergarten teachers' beliefs to determine what kind of curriculum is most widely practiced and to what extent these curriculum approaches are related to teacher background and to ways in which teachers use computers.

This problem is significant to three groups involved in the education of young children. First, there are kindergarten teachers who desire a greater understanding of their own teaching practices in order to plan and implement curricula that will best promote student learning. The second group consists of parents who often wish to have their children enter the computer world as early as possible in order to compete in a rapidly changing society. The last group includes administrators who strive to balance the desires and needs of the first two groups as well as plan for the most efficient use of computer materials in their schools.

Hypothesis to be Tested

This study can be framed in terms of a research hypothesis: there is a significant difference in the background or computer usage between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment. The hypothesis is further defined with the addition of two subhypotheses.

Subhypothesis 1. There is a significant difference in the background as defined by age, education, teaching experience, kindergarten teaching experience, hours in early childhood education, professional growth activities in early childhood education, hours in computer education, and professional growth activities in computer education between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment.

Subhypothesis 2. There is a significant difference in the computer usage as defined by frequency of use, access to computers, the type of program most often used, the subject most often used, the group size for computer instruction, and the method for selection of programs between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment.

Procedures

To conduct the study and test the hypothesis, the following procedure was followed. In April of 1988, 93 kindergarten teachers in the Omaha Public School System received the Teacher Belief Rating Scale (Verma & Peters, 1978). This is a self-report instrument designed to evaluate the beliefs of early childhood teachers in terms of two developmental theories: Piagetian vs. behaviorist. The Piagetian theory would be representative of a developmentally appropriate belief while a behaviorist would be representative of an academic belief.

These teachers also received questionnaires that gathered information about their backgrounds, as well as how they used computers in the classroom. Background information included age, education, experience, and training in both computers and early childhood education. Computer usage information included frequency, access, group size, subject area, program type, and program choice.

The data from each teacher's response to the Teacher Belief Rating Scale was first evaluated to determine which teachers were developmentally based in their beliefs and which were academically based. These results were compared to figures from a national survey to assess the extent they approximate findings from a larger sample. Next the data from the questionnaires of each group was compared to see if there was a significant difference in any of the

background information as well as the computer usage information.

Setting/Background

This study took place during the 1987-88 school year in the Omaha Public School System. This midwestern school system located in an urban setting served approximately 23,000 elementary students.

The surveys were distributed through the school mail in early April to 93 kindergarten teachers. This was done with the cooperation of the Departments of Research and Instruction. From this initial mailing, 56 surveys were returned, a return rate of over 60%.

Definition of Terms

Developmentally appropriate curriculum. Activities, materials, and strategies planned by teachers who view young children's growth as an interactive process with the environment in order to construct their own understanding of reality.

Academically based curriculum. Activities, materials, and strategies planned by teachers who view young children as passive learners. It is characterized by directed instruction and sequenced activities.

Professional growth activities in early childhood education. Workshops, inservice lessons or meetings that focus on early childhood education.

Professional growth activities in computer education. Workshops, inservice lessons or meetings that focus on computer education.

Assumptions and Limitations

There were two assumptions to this study.

Assumption 1. All subjects responded truthfully to the survey and questionnaire.

Assumption 2. The subjects were representative of kindergarten teachers in a metropolitan district.

There were three limitations to this study.

Limitation 1. Subjects were taken from only the Omaha Public Schools' kindergartens.

Limitation 2. Subjects were taken from only one school district in one city.

Limitation 3. The data collected was based on self-report and not on outside observers.

CHAPTER II

REVIEW OF THE LITERATURE

This chapter contains a review of literature from three areas associated with the topic of computers in kindergarten: the kindergarten curriculum, computer education, and the role of computers in early childhood education.

Kindergarten Curriculum

Kindergarten began in the United States nearly 125 years ago. The early curriculum was influenced predominately by the philosophy and pedagogy of Friedrich Froebel. It was originally child-centered and developmentally based. That meant it focused on the development of the whole child--physical, social, emotional and intellectual (Bartolini & Wasem, 1985).

Other educators continued to influence the curriculum established by Froebel and supported the idea of childhood as a unique time in human growth and development. John Dewey argued the psychic needs of the child must be addressed in terms of what the child is, not what the child will be (Postman, 1982). Another educator, Maria Montessori, developed a method of teaching young children still seen in practice today. Components of her curriculum included a prepared environment, self-correcting materials, and skills for everyday living (Ramsey & Bayless, 1980).

Psychologist Jean Piaget's model of the stages of cognitive development further influenced how educators viewed children's growth in the early years. According to this model, most children are in the preoperational stage during their kindergarten year. Some of the growth patterns observed during this time include: (a) children are quite ego-centric and self-centered, (b) their learning requires many experiences with concrete objects, and (c) they often solve problems by trial and error (Ramsey & Bayless, 1980).

Even as these educators more firmly defined a curriculum appropriate to the needs and interests of five-year-old children, opposing influences were at work. Criticism of American education influenced curriculum changes of a different kind. With the launching of Sputnick in 1957, Americans became concerned that schools were not providing enough formal teaching. The advent of instructional television, the back to basics movement, and increased use of standardized achievement and screening tests for kindergarten children set the stage for a change in curriculum (Bartolini & Wasem, 1985).

In the 1960's, this change in the educational focus of early childhood education became apparent. The concern at that time with poverty and its injustices led to the formation of the Headstart program. Headstart's purpose was to prepare young children for future academic and

social success. During this time, Hunt and Bloom's work on intelligence and experience also did much to shift the curricular emphasis to academics (Webster, 1984).

One of the most recent changes influencing the kindergarten curriculum has been an increased number of students. According to Schweinhart's 1980 population survey, 93% of the nation's 5-year-olds were involved in some kind of early childhood education program. Robinson (1987) found eight states mandated children begin school at age 5. Kindergarten has become a focus for establishing continuity in school programs. Materials and teachers often have been a downward extension of the existing academic curriculum (Bartolini & Wasem, 1985).

Present kindergarten programs range from low-pressure, permissive child growth and development approaches to highly structured, carefully programmed environments (Ramsey & Bayless, 1980). A recent survey from the Educational Research Service (1986) found that the primary focus of kindergarten programs fell into four main categories, with Academic (skills and achievement) encompassing 22% of the programs, Preparation (academic/social readiness) 62.6%, Developmental 8.1%, and Compensatory (help for disadvantaged) 0.5%. Elkind (1987), other early childhood specialists, some teachers, and parents have protested inappropriate academic curricula that do not take into account realities of child growth and development.

One such protest occurred when the Nebraska State Department of Education (1984) developed a position paper on kindergarten. It stated that a shift in emphasis in recent years caused many teachers and administrators to think the kindergarten program should require mastery of content that was formerly expected in later primary grades. This, in spite of a growing body of research that confirmed that the course of the social, physical, emotional and cognitive development of young children has not changed, despite changes in society.

Another protest came when the National Association for the Education of Young Children (1986) published positions statements on developmentally appropriate practice in early childhood programs. The first statement addressed the practice in programs for 4- and 5-year-olds. They defined developmentally appropriate practice as having two dimensions:

1. Age appropriateness. Human development research indicates that there are universal, predictable sequences of growth and change that occur in children during the first nine years of life. These predictable changes occur in all domains of development--physical, emotional, social, and cognitive. Knowledge of typical development of children within the age span served by the program provides a framework from which teachers prepare the learning environment and plan appropriate experiences.

2. Individual appropriateness. Each child is a unique person with an individual pattern and timing of growth, as well as individual personality, learning style, and family background. Both the curriculum and adults' interactions with children should be responsive to individual differences. Learning in young children is the result of interaction between the child's thought and experiences with materials, ideas and people. These experiences should match the child's developing abilities, while also challenging the child's interest and understanding (National Association for the Education of Young Children, 1986).

The kindergarten curriculum has changed in many schools from a child-centered environment to one that emphasized academic achievement. According to Jorde (1986), the most recent trends in early childhood education included the concern with ensuring quality by changing the narrow cognitive context that was often prevalent. David Elkind (1987) believed that the early cognitive approach could lead to elementary school burnout. Although not all research supports the developmentally appropriate curriculum as best (Pipitone, 1986), some studies show that it could be particularly effective with children deemed vulnerable for later school failure (Jowett & Silva, 1986; National Association for the Education of Young Children, 1987; Berrueta-Clement & Schweinhart, 1984).

Computer Education

Both Naisbitt (1982) and Turkle (1984) agreed that in the America of the information age, the computer had arrived to bring profound social changes affecting a whole generation of children. Seymor Papert's book, Mindstorms: Children, Computers, and Powerful Ideas, (1980) described the value of using computers with children. His belief in the advantages of even young children using computers to program and learn how to think has influenced many educators.

Educators have only considered such influences within the past decade. Moursund (1986) found that while the history of computer education in precollege work dated from the late 1950's, it was not until the late 1970's that microcomputers began entering the schools and computer literacy became important. As a result, computer usage increased and school curricula changed.

Becker's survey (1986) of instructional uses of school computers found an average of four computers per school in September of 1983. Between the spring of 1983 and the spring of 1985, the number of schools with five or more computers jumped from 7% to 54%. He believed that by that time schools had learned that large numbers of computers were needed if computers were to be more than showpieces.

This same survey listed the kinds of instructional uses of computers in elementary schools. Drill and practice was the most frequent use (56%), discovery learning or problem solving was next (17%), followed by programming (12%), word processing (9%), and other uses (6%). Math and language arts were primary subjects for computer use. Yet, Cuffaro (1984) stated that the nature of computers has led many to think they have the potential to alter how children and their learning styles are viewed and to influence the content of the curriculum.

For instance, computers have enabled children to shift from memorizing facts to managing information. Schiffman (1986) found that a current trend has been to teach the use of productivity tools (word processors, spreadsheets, data base managers, and graphics) in the classroom. Moursund (1986) defined this incorporation as computer integrated instruction. Emilhovich's study (1986) found that using the computer as a tool in a carefully structured teaching process has taught children how to think. These findings have led to a renewed interest in problem solving (Moursund, 1985).

However, Becker's survey (1986) revealed that drill and practice was the most frequent computer use in elementary schools. Bork (1985) hypothesized that this was the result of a lack of sufficient teacher preparation for using computers and a lack of first-rate, computer-based

learning material. Teacher education and quality materials have been addressed as current issues for computer education in elementary schools.

Computers in Early Childhood Education

The history of computers in early education has been brief but explosive. As recently as 1983, there was little or no research available in this area. Many studies have since been completed. The focus of this topic has changed from whether computers are appropriate at all for this age level (Burg, 1984; Cuffaro, 1985; Hyson & Eyman, 1986), to what kinds of computer activities and materials are appropriate to use with young children (Buckleitner, 1985; Grover, 1986; Spriell & Turner, 1986).

From this change in focus, it appears that computers have arrived in early childhood education. Hyson and Eyman (1986) found that parents have increasingly expected high quality early childhood programs to include computer experiences. Cuffaro (1984) listed four attributes of computers that have been basic considerations in the thinking that has guided planning of programs for young children for a long time. These attributes are as follows: (a) generate excitement in the learner, (b) provide immediate feedback and opportunity for individualized learning, (c) promote social interaction, and (d) enable the child to learn to think and be in control of his/her learning. Spriell and Turner (1986) noted that learning

for young children occurred as a result of many experiences with real objects, events, and people. Computers have become one more learning tool in their environment.

Brady and Hill (1984) raised the issue of what were appropriate experiences on microcomputers for young children. Anselino and Zenck (1987) stated that since computers are controlled by software, it was essential to select programs that were consistent with the principles of good early childhood education. Both Grover (1986) and Buckleitner (1986) evaluated software in terms of its developmental appropriateness. Beaty and Tucker (1987) defined a developmental toy as one that was challenging but not too difficult for a child. A central problem in planning an appropriate curriculum has been one of matching the right materials with the right child.

Some studies have shown the effectiveness of such matching. For example, Jaworski and Brummel (1984) found that 13 first-graders who learned to use Logo over a 10 week period developed specific skills in the following: (a) controlling the computer, (b) cooperative and individual problem solving, (c) creative expression, and (d) abstract Math and geometric principles. Cook and Murk (1987) found that active children who were introduced to Logo on the basis of their developmental ability, concentrated on using it as a tool to creativity. Piazza and Tomlinson (1986) used IBM's Writing to Read program to focus on children's

development of literacy through the linking of reading, writing, oral language, and word processing. They found that these communicative skills interplayed and inevitably fused as young children experimented with print using computers.

The important issues in using computers with young children are the same issues that have been addressed in the other two areas. They include planning and using developmentally appropriate computer activities and materials (Beaty & Tucker, 1987), as well as providing training and time for teachers to use these materials (High/Scope Educational Research Foundation, 1987).

Summary

The literature review indicates that recent changes in both kindergarten philosophy and increased computer usage are both issues influencing the content of early childhood education today. This study will add to the literature by examining the relationship between kindergarten teachers' philosophies and how they use computers.

CHAPTER III

DESIGN OF THE STUDY

The kindergarten curriculum of the 1980's has been influenced by many forces. Among the most powerful of these have been emerging philosophies about appropriate kindergarten learning experiences and the impact of computer technology in the early learning years. The focus of this study has been on the possible relationships between these two factors. It was designed as a cross-sectional survey of kindergarten teachers in the Omaha Public Schools to gather information about their philosophies, backgrounds, and computer usage.

In this chapter, information about how the study was conducted is provided. It includes a description of the subjects involved, background information about the survey instruments, and a discussion of the procedures used to gather and analyze the data.

The Sample

The subjects of this survey were all kindergarten teachers in the Omaha Public Schools. This metropolitan district served approximately 41,000 students during the 1987-88 school year. The 93 subjects were identified as kindergarten teachers in the 1987 Omaha Public Schools personnel directory.

Instrumentation

There were three instruments used in this study. One was a questionnaire designed for this study to gather background data. Another was a questionnaire also designed for this study to gather computer usage information. The final was a Teacher Belief Inventory (Verma & Peters, 1974) used to categorize the teachers by philosophy.

Background Information Questionnaire. This instrument contained eight questions about the teachers' backgrounds (See Appendix A). These questions asked for information about: (a) age, (b) education, (c) teaching experience, (d) kindergarten teaching experience, (e) number of credit hours in early childhood education, (f) activities in early childhood education, (g) number of credit hours in computer education, and (h) activities in computer education. These questions were designed to be completed quickly by having subjects check from a range of responses those that most nearly described their situation.

Computer Usage Questionnaire. This part of the instrument was constructed to find out how the teachers used computers (See Appendix A). It consisted of six questions. These questions asked the teachers to report on: (a) frequency of use on a weekly basis, (b) access to computers, (c) group size for instruction, (d) subject area most frequently used, (e) program type most frequently selected, and (f) method of program selection most often

used. These computer usage questions were designed to be completed quickly by having subjects check a response for the first two items and then rank responses for the next four items.

Teacher Belief Inventory. This instrument was designed by Verma and Peters in 1973 at Pennsylvania State University in order to study day care teachers' practices and beliefs (See Appendix B). Their research as well as others (Verma, 1973; Cohen, Peters & Willis, 1976; Kagan & Smith, 1988) demonstrated its content, concurrent validity and reliability.

It consists of 30 Likert-type items derived from Piagetian theory, operant theory, and maturationist theory. The inventory yields one score for each of the three theories and was designed to assess the degree of agreement with these theories. The Piagetian theory would represent the basis for a cognitive-developmental classroom while the operant theory would represent the basis for an academic classroom. Since the purpose of this study was to look at differences between cognitive-developmental and academic teachers, only the scores from those theories were used.

Don L. Peters, University of Delaware, granted permission to use this instrument. It was attached to the questionnaires and labeled, Teacher Belief Inventory. Teachers were instructed to respond with their own personal belief or opinion to indicate agreement or disagreement.

The scale of response ranged from strongly agree, through moderately agree, slightly agree, slightly disagree, and moderately disagree, to strongly disagree.

The Procedure

Surveys were sent to 93 kindergarten teachers through the school mail on April 11, 1988. The Omaha Public School's Departments of Research and Instruction granted permission for distribution of the instruments. This initial mailing included a brief cover letter introducing the author and explaining the reason for the survey (See Appendix C). Self-addressed envelopes were included with instructions to return the surveys through the school mail. Care was taken to preserve anonymity and no survey was associated with any particular individual.

A follow-up letter was mailed on April 25, 1988 to the kindergarten teachers (See Appendix D). This letter consisted of a brief "thank you" to those who had returned the surveys. It also asked those who had not completed them to do so. Most surveys were returned within the initial two-week time period. However, some were returned as late as May 13, 1988. By the end of the school year, 56 surveys were returned.

Data Analysis

A consecutive number was assigned to each survey when it was returned and the information was entered into a database. The accuracy of the scores was checked, as well

as the information transcribed from the surveys to prepare the database.

Scores from the Teacher Belief Inventory were used to form four groups. These scores indicated that a teacher had either a cognitive-developmental belief, an academic (behaviorist) belief, a maturationist belief, or no strong adherence to any belief. For the purpose of this study only two of the groups were used: the teachers whose scores indicated that they believed in a cognitive-developmental philosophy and the teachers whose scores indicated that they believed in an academic (behaviorist) philosophy. After sorting the teachers into these two groups, information from the questionnaires was tabulated to compare the teachers in each area of background and computer usage.

These procedures were used to prepare the information for testing the following hypotheses:

The null hypothesis. There is no significant difference in the background or computer usage between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based kindergarten environment. It was further defined with the addition of two subhypotheses.

Subhypothesis 1. There is no significant difference in the background as defined by age, education, teaching experience, kindergarten teaching experience, hours in

early childhood education, professional growth activities in early childhood education, hours in computer education, and professional growth activities in computer education, between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment.

Subhypothesis 2. These is no significant difference in the computer usage as defined by frequency of use, access to computers, the type of program most often used, the subject area most often used, the group size for computer instruction, and the method for selection of programs between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment.

A chi-square test of independence was used to compare each area of the subhypotheses to see if there were any relationships between the two groups of teachers in their backgrounds and how they used computers. A level of .05 was established to accept or reject each hypothesis. The chi-square values were calculated for each factor under each subhypothesis.

CHAPTER IV

FINDINGS

The current trend toward a cognitive developmentally based kindergarten curriculum and the changes from increased computer use have been the focus of this study. The Teacher Belief Inventory was used to determine the philosophy of kindergarten teachers in the Omaha Public School System. Questionnaires were designed and used to find out about teacher background and computer usage. Together these instruments were mailed to 93 kindergarten teachers in April of 1988. The 56 teachers who returned usable surveys provided a response rate of 60%.

This chapter contains information about how the survey results were analyzed to compare teachers on the basis of differing kindergarten philosophies, demographic characteristics, and computer usage. It also includes the results of applying statistical tests to determine whether hypotheses related to these factors should be accepted or rejected.

Teacher Belief Inventory

As the surveys were returned, each was assigned a consecutive number from 1 to 56 and information was entered in a database. Scores from the Teacher Belief Inventory were obtained by assigning points for each item

from 6 to 1 on the following basis: strongly agree(6), moderately agree(5), slightly agree(4), slightly disagree(3), moderately disagree(2), strongly disagree(1). Sums from selected items (See Appendix B) yielded three scores which were also entered in the database. For the purposes of this study, the score representing a maturationist viewpoint was not used.

A difference of five or more points between the remaining two scale scores was used to determine whether the subject had a cognitive-developmental or academic (behaviorist) philosophy. The original scoring on the scale used a 10 point difference (see Appendix B) to indicate philosophical differences. For this study a five point difference was used to boost the sample sizes within the groups. A difference of less than five points between sources identified a subject as not having a strong belief toward either philosophy. Twelve respondents were eliminated through this sorting procedure. Another five subjects were not used because their data were incomplete. Of the 39 remaining subjects, 20 fell into the cognitive-developmental category and 19 were in the academic (behaviorist) category. Results and percentages are shown in Table I.

Table I

Teacher Belief Inventory Results

Group	Subjects	
	Number	Percent
Cognitive-developmental	20	36
Academic	19	24
Neither	12	21
Incomplete	5	9
Total	56	100

When compared to results from a nationwide survey of kindergarten programs and practices conducted by the Educational Research Service (1986) some difference were found. The results of that survey of kindergarten teachers and administrators showed that the primary focus of kindergarten programs included: (a) academic (skills and achievement) at 22%, (b) preparation (academic/social readiness) at 62.6%, (c) developmental (child development) at 8.1%, and (d) compensatory (help for disadvantaged) at .5%.

The results from this study show a higher percentage of subjects with a cognitive-developmental philosophy, 36%, than the ERS survey, 8.1% The differences in results may be attributed to a number of factors. One may have been the difference in samples. The ERS surveyed both

kindergarten teachers and administrators. This study surveyed only kindergarten teachers. These teachers may have been more familiar with the terminology used to describe their programs. Another factor could have been the difference in time. The ERS survey was completed in 1986 while this one was conducted in 1988. In those two years considerable information had become available about cognitive-developmental instruction. Because of that information, teachers in the most recent survey may have had a better understanding of what constitutes a cognitive-developmental program.

Demographic Information

After sorting the subjects into two groups according to philosophy, information from the first questionnaire was tabulated. The results showed differences between those groups in age, education, teaching experience, kindergarten teaching experience, college hours of credit in early childhood education, professional growth activities completed in early childhood education, college hours of credit in computer education, and professional growth activities completed in computer education. Results are shown in Tables II through IX.

Subjects in the cognitive-developmental group were younger than those in the academic group as shown in Table II. The mode for cognitive developmental teachers was between 30 and 40 years of age while the mode for academic teachers was between 50 and 60 years of age.

Table II

Age

	Group	
Years	Cognitive-Developmental	Academic
20-30	2	1
30-40	8	3
40-50	6	5
50-60	4	10
Total	20	19

The educational background of each group was very similar as shown in Table III. The mode for cognitive-developmental was a bachelor's degree plus some hours. The mode for academic was a bachelor's degree plus 18 hours.

Table III

Education

	Group	
Degree	Cognitive-Developmental	Academic
BS	2	1
BS+	9	3
BS+18	5	7
MS	1	5
MS+	3	3
Total	20	19

Subjects in the academic group had more teaching experience than those in the cognitive-developmental group as shown in Table IV. The mode for the academic group was 21 or more years of experience. The mode for the cognitive-developmental group was 5 years or less of experience. Given the age difference, this result is not surprising.

Table IV

Teaching Experience

	Group	
Years	Cognitive-Developmental	Academic
0-5	6	0
6-10	3	3
11-15	1	4
16-20	5	3
21+	4	9
Total	19	19

Subjects in the academic group had more kindergarten teaching experience than those in the cognitive-developmental group although the range was not as great as total teaching experience. These findings are shown in Table V. The mode for academic teachers was 6 to 10 years of experience while the mode for cognitive-developmental teachers was 5 years or less of experience.

Table V

Kindergarten Teaching Experience

	Group	
Years	Cognitive-Developmental	Academic
0-5	9	2
6-10	4	7
11-15	3	2
16-20	2	2
21+	2	6
Total	20	19

Subjects in the cognitive-developmental group had more credit hours in early childhood education than those in the academic group but scores were evenly distributed in all categories. These findings are shown in Table VI. The mode for cognitive-developmental teachers was both 3 to 6 hours and 21 or more hours. The mode for academic teachers was 0 hours.

Table VI

Early Childhood Education Credit Hours

	Group	
Hours	Cognitive-Developmental	Academic
0	2	5
3-6	6	3
9-12	2	4
15-18	3	3
21+	6	4
Total	19	19

Subjects were very evenly matched in the number of professional growth activities they had complete as shown in Table VII. Both groups had a mode of 1 to 2 activities.

Table VII

Early Childhood Professional Growth Activities

	Group	
Activities	Cognitive-Developmental	Academic
0	2	2
1-2	11	6
3-4	4	5
5-6	2	1
7+	1	5
Total	20	19

The results of Table VIII comparing computer credit hours were striking in their similarities and findings. Both groups had a mode of 0 credit hours in computer education with most all of the teachers fitting into this category. Only six respondents indicated that they had 3 to 6 hours of computer education. That response was the highest level of training.

Table VIII

Computer Education Credit Hours

	Group	
Hours	Cognitive-Developmental	Academic
0	18	15
3-6	2	4
9-12	0	0
15-18	0	0
21+	0	0
Total	20	19

Teachers indicated more diversity in the amount of professional growth activities in computer education than in the number of credit hours in computer education. These findings are shown in Table IX. Subjects in the academic group reported participating in more computer inservice activities than those in the cognitive-developmental group although the difference was not great. The mode for academic teachers was 3 to 4 activities. The mode for cognitive-developmental teachers was 1 to 2 activities.

Table IX

Computer Education Professional Growth Activities

Activities	Group	
	Cognitive-Developmental	Academic
0	4	4
1-2	10	4
3-4	1	7
5-6	4	2
7+	1	2
Total	20	19

Computer Usage Information

Still using the two group of subjects, information was tabulated from the second questionnaire. This information was used to compare differences between the groups in computer usage. Results are shown in Tables X through XV.

The academic group used the computer more often than the cognitive but the difference was minimal. These finding are shown in Table X. The mode for academic teachers was 1 to 2 times a week. The mode for cognitive-developmental teachers was both less than once a week and also 1 to 2 times a week.

Table X

Frequency of Computer Usage

	Group	
Weekly Use	Cognitive-Developmental	Academic
Less than 1	8	4
1-2	8	10
3-4	4	3
5 or more	0	2
Total	20	19

Both groups had nearly equal access to computers as shown in Table XI. The mode for cognitive-developmental teachers was to share the computer with 1 or 2 other teachers. The mode for academic teachers was both to share with 1 or 2 other teachers and share with 3 or more teachers.

Table XI

Access to Computers

	Group	
Access	Cognitive-Developmental	Academic
No Access	1	1
Share with 1-2	9	8
Share with 3 or More	8	8
Have it Always	1	2
Total	19	19

Subjects were very evenly matched in the type of programs they selected as a first choice. These findings are shown in Table XII. The mode for both cognitive-developmental teachers and academic teachers was games.

Table XII

Type of Program Selected as a First Choice

	Group	
Program	Cognitive-Developmental	Academic
Drill & Practice	4	7
Problem Solving	0	2
Word Processing	0	0
Games	13	8
Teacher Utility	0	0
Total	17	17

When comparing teachers on the subject area for computer instruction, their first choices were nearly the same. As shown in Table XIII, the mode for both groups was reading readiness. One teacher in each group chose mathematics, but no teachers chose language arts, social studies, science, or art.

Table XIII

Preferred Subject Area

	Group	
Subject	Cognitive-Developmental	Academic
Language Arts	0	0
Mathematics	1	1
Reading Readiness	14	12
Social Studies	0	0
Science	0	0
Art	0	0
Total	15	13

Teachers' choices were similar in the kind of instructional setting selected as a first choice as shown in Table XIV. The mode for cognitive-developmental teachers was both to use the computer as a learning center and also with an aide. The mode for academic teachers was to use the computer as a learning center.

Table XIV

Preferred Instructional Setting

	Group	
Setting	Cognitive-Developmental	Academic
Whole Class	1	1
Learning Center	8	10
With an Aide	8	5
Small Group	1	1
Total	18	18

The groups showed some difference in how they selected programs, albeit a very small one. As shown in Table XV, the mode for cognitive-developmental teachers was to choose programs based on other teachers' recommendations. The mode for academic was to choose a program following a demonstration of its capabilities.

Table XV

Preferred Program Selection

	Group	
Method	Cognitive-Developmental	Academic
Other Teachers	7	5
Computer Representative	2	2
Written Reviews	1	1
Following Demonstrations	6	8
Supervisors	0	0
Total	16	16

Hypothesis Testing

Data from Tables II through XV was used to compare the two groups of teachers in order to accept or reject the hypothesis. The hypothesis stated that there is no significant difference in the background or computer usage between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment. This hypothesis was further defined by the addition of two subhypotheses.

Subhypothesis One. There is no significant difference in the background as defined by age, education, teaching experience, kindergarten teaching experience, hours in early childhood education, professional growth activities in early childhood education, hours in computer education, and professional growth activities in computer education between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment.

Subhypothesis Two. There is no significant difference in the computer usage as defined by frequency of use, access to computers, the type of program most often used, the subject are most often used, the group size for computer instruction, and the method for selection of programs between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment.

A chi-square test of independence was used to test each subhypothesis. This test was used to compare the observed frequencies from the cognitive-developmental group of teachers and the academic group in each area of the two subhypotheses with theoretical frequencies to determine if the differences were significant. Results of the tests can be found in Table XVI and XVII.

Results from Table XVI which gives the chi-square value for each area of subhypothesis one show there were no significant differences at the .05 level between groups except in the area of teaching experience. The academic group had significantly more teaching experience than the cognitive-developmental group.

Table XVI

Chi-Square Values of Demographic Data

Area of Comparison	Chi-Square Value	Degree of Freedom
Age	5.2462	3
Education	6.3118	4
Teaching Experience	10.2231 *	4
Kindergarten Teaching Experience	7.4520	4
Early Childhood Education Hours	3.3524	4
Early Childhood Ed. Activities	4.5591	4
Computer Education Hours	0.9144	1
Computer Ed. Activities	8.0511	4

* Significant at .05 level

Results from Table XVII which listed chi-square values for each area of subhypothesis two show there were no significant differences at the .05 level between groups in how they use computers.

Table XVII

Chi-Square Values of Computer Usage Data

Area of Comparison	Chi-Square Value	Degree of Freedom
Frequency of Use	3.6752	3
Access to Computers	0.3922	3
Group Size Selected as First Choice	0.8867	3
Subject Area as First Choice	0.0110	1
Program Type as First Choice	4.0087	2
Program Selection as First Choice	0.6190	3

(None Significant at .05 Level)

Summary

On the basis of this data, subhypothesis one was accepted since there were no significant differences in the backgrounds of teachers who have an academic teaching philosophy and those who have a cognitive-developmental teaching philosophy except in the area of total teaching experience. Subhypothesis two was also accepted since there were no significant differences in how each group of teachers used computers.

Therefore, with the exception of teaching experience, the hypothesis that there are no significant differences in the background or computer usage between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment was accepted.

CHAPTER V

SUMMARY, CONCLUSIONS, AND RECOMMENDATIONS

The purpose of this study was to examine kindergarten teachers' philosophies of education and their methods of using computers in the classroom to see if there were any relationships between the two. More specifically, the hypothesis stated that there is no significant difference in the background or computer usage between teachers who believe in an academic kindergarten environment and those who believe in a developmentally based environment.

This chapter contains a summary of how the study developed, conclusions from the results, and recommendations for future study and consideration.

Summary

The study developed through stages of identification, examination, and planning. Two areas of interest in elementary education during the 1980's that had potential to change and spark controversy among educators were first identified. One issue was what kind of kindergarten curriculum was most appropriate for young children. The other issue was how computers were being used in the classroom, especially by young children.

Next, an examination of the literature associated with each issue was necessary to determine what research had

been conducted to date. The theories and forces that have shaped practices and kindergarten curriculums were many and varied. As a result, programs in kindergarten showed great variation as well. However, one clear issue in the 1980's has resulted in the trend to move from academically oriented programs to cognitive-developmentally based ones.

The literature also revealed that large numbers of computers have become available in most elementary schools in the 1980's. As a result, computer education had changed its focus in the elementary school curriculum from a separate area of study to becoming integrated into other subjects. Computers in early childhood education had also been an issue in the 1980's. As parents increasingly expected and supported their use, the issue of "whether or not computers were appropriate" changed to "what kinds of programs and activities were best." The focus here again reflected the trend to cognitive-developmentally based materials and activities.

The review of the literature in these three areas led to planning for the purposes of this study. One purpose was to find out what kindergarten teachers believed was appropriate for five-year-olds. Since the trend had been to move from an academically based curriculum to a cognitive-developmentally based curriculum, those two theories were selected for study. The Teacher Belief

Rating Scale (Verma & Peters, 1975) was chosen as an instrument to categorize teachers' beliefs in terms of those two theories.

Another purpose of this study was to discover the extent of computer education in kindergarten. Because of the increased number of computers in elementary schools, one intent was to find out if all kindergarten teachers had access to computers and how often they used them.

Because the focus of computer education for young children had been on appropriate materials and activities, a third purpose was to discover how these teachers used computers. Finally, would there be any differences in what the teachers believed and how they did use computers? Two questionnaires, designed to survey the teachers' backgrounds and computer usage, would provide data for comparison.

The process of this study involved three components. The first part was designing the questionnaires and distributing them with the rating scale. The second part was gathering the data from the surveys in an organized format. The last part was examining the data to look for relationships that would support or reject the hypothesis.

Conclusions

The results of this study supported the hypothesis. There were no significant differences between these two groups of teachers in background except for teaching experience. And there were no significant differences in

how these teachers used computers. The results of the surveys showed an even distribution of teachers philosophies as well as many similarities between groups in both background and computer usage.

Teacher beliefs. The number of teachers who believed a cognitive-developmentally based curriculum was best was very nearly the same as those who believed an academically based curriculum was best. Perhaps these teachers are following a trend in early childhood education reported by Jorde in 1986 to change the narrow cognitive context of their programs. It might also be that change has made a number of teacher less sure of their philosophy. Or perhaps as Verma and Peters found in 1975, each teacher has attempted to put together a program that appears to work best for her. Her program may not be representative of one theory, but a combination of many.

Teacher background. These groups of teachers were very similar in their backgrounds with the exception of teaching experience. The majority of respondents were 30 years or older with a bachelor's degree plus some graduate hours. Most of these teachers had some credit hours in early childhood education but only a small number had credit hours in computer education. Many had participated in one to two professional growth activities in early childhood education as well as one to two professional growth activities in computer education.

Teaching experience. The only difference in these groups of teachers' background was in teaching experience. The cognitive-developmental group had significantly less teaching experience than the academic group. Although the differences in kindergarten teaching experience was not significant, those in the cognitive-developmental group also had fewer years of experience than those in the academic group. Both groups had more total teacher experience than kindergarten teaching experience, suggesting that these teachers may have moved from other grade levels.

Computer Education. The number of teachers with credit hours in computer education was very small. Of the 56 teachers who responded, only eight reported they had 3 to 6 credit hours. This finding reflects Bork's (1985) concern about a lack of sufficient teacher preparation for using computers. However, when teachers with no credit hours were compared to those with 3 to 6, no significant differences were found in how they used computers, with the exception of selecting programs. Teachers with no hours reported that they selected programs mainly following a demonstration of the program. Teachers with 3 to 6 hours reported that they selected programs mainly from the computer representative's recommendations.

Computer Usage. When comparing the academic and cognitive developmental groups of teachers, no significant differences were found in any area of how they used computers. Both groups used the computer an average of 1 to 2 times a week and shared the computer with other teachers. This finding seems to support what Becker's 1986 survey reported about increasing numbers of computers in elementary schools. Only four teacher reported that they had no access at all to the computers in their schools.

Both groups also reported that their first choice for using the computer was as a learning center. The cognitive-developmental group also ranked this highest as a second choice. But the academic group chose whole class instruction as its second choice. These differences were not significant.

These groups also indicated that reading readiness and math were the first and second choices of subject areas for computer use.

The way these teachers selected programs was also very similar. The most frequent method of selection was following demonstrations. That would seem appropriate for teachers who have had little experience with computers. It would seem plausible that teachers with little experience with computers would feel more inclined to use a program that they had actually seen in use.

Recommendations

Based on the study and analysis of information, the following recommendations are made:

1. To have greater validity a similar study should be done with random sampling of kindergarten teachers from many districts in the metropolitan area .

2. Additional data from outside observation of teacher practices and choices of activities would provide greater validity for this study.

3. A study should be conducted to focus on comparisons with another district, specifically one that has adopted a cognitive-developmental model of instruction for its kindergarten curriculum.

4. Computer workshops for teachers should include software demonstrations with the opportunity for teachers to have hands-on experience with the program.

5. Professional growth activities for teachers should include demonstrations of how to integrate computer activities into all areas of curriculum.

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APPENDIX A

Computer Activities Questionnaire

This questionnaire is composed of two parts. The first part asks you to describe you and your teaching situation. The second part asks you about computer use in your classroom. Please answer all questions, leave no blanks and DO NOT WRITE YOUR NAME on anything.

Part I

1. Age
____ 20-30 ____30-40 ____40-50 ____50-60 ____over 60

2. Educational background
____ BS ____BS+ ____BS+18 ____MS ____MS+

3. Total years of full time teaching
____ 0-5 ____6-10 ____11-15 ____16-20 ____21+

4. Total years of teaching kindergarten
____ 0-5 ____6-10 ____11-15 ____16-20 ____21+

5. Number of University credit hours in early childhood education
____ 0 ____3-6 ____9-12 ____15-18 ____21+

6. Number of School District staff development activities attended on early childhood education
____ 0 ____1-2 ____3-4 ____5-6 ____7+

7. Number of University credit hours in computer education
____ 0 ____3-6 ____9-12 ____15-18 ____21+

8. Number of School District staff development activities attended on computer education
____ 0 ____1-2 ____3-4 ____5-6 ____7+

Part II

1. FREQUENCY: I use computers with my students:
_____a. less than once a week
_____b. 1 to 2 times per week
_____c. 3 to 4 times per week
_____d. 5 or more times per week

2. ACCESS: My time available with the computer is best described by the following situation:
   _____a. no access at all
   _____b. sharing with 3 or more teachers
   _____c. sharing with 1 or 2 teachers
   _____d. have one in my room all or most of the time

If you have access to a computer, please continue with items 3 - 6. If not, please go on to the inventory.

The remaining questions are no longer multiple choice but require you to rank your responses. Please start with number 1 to indicate your most frequent choice. 2 for the next most frequent choice, etc.

3. GROUP SIZE: I use the computer most often
   _____ with whole class lessons & activities
   _____ as a learning center for 1 or 2 students
   _____ as an activity with a computer aide
   _____ in small group settings

4. SUBJECT AREA: I use computer activities most often in
   _____ language arts
   _____ mathematics
   _____ reading readiness
   _____ social studies
   _____ science
   _____ art

5. PROGRAM TYPE: The type of software I use most often can best be classified as
   _____ drill & practice
   _____ problem solving
   _____ word processing
   _____ games
   _____ teacher utility

6. PROGRAM CHOICE: I select software to use in my classroom
   _____ according to other teacher's recommendations
   _____ according to the computer representative's recommendation
   _____ after reading reviews in professional journals
   _____ following demonstrations at class or inservice activity
   _____ according to my supervisor's recommendations

APPENDIX B

Teacher Belief Inventory

The best answer to each of the following statements is your own personal belief or opinion. Answer every item by checking the appropriate response.

1. Teacher uses ongoing activities to teach language rather than having a separate language training program.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

2. Language is used sparingly in instruction and always in a way matched to the child's level of readiness.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

3. Teacher is interested in how a child works and plays rather than what he or she produces.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

4. Teacher corrects child's answer or behavior to get adult-acceptable responses.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

5. Teacher helps or provides information to the child only when absolutely necessary.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

6. Teacher provides interpersonal support for children's exploration and never pushes children toward higher levels of achievement.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

7. The child's own interest and involvement in an activity is his or her reward; the teacher does not provide other rewards such as selective praise, privileges, or prizes.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

8. Teacher strongly encourages dramatic play as a means of solving emotional problems.

:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

9. Teacher adjusts language to child's level, or uses child's own words.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

10. Teacher is interested in activity or task completion.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

11. Teacher acts as source of information by lecturing or explaining.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

12. Teacher provides major segments of the day for free play.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

13. Teacher permits child to use materials and equipment in ways he or she wants rather than the way they are designed to be used.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

14. Teacher accepts child's answers and responses even if not correct.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

15. Teacher structures each day depending on spontaneous choices of children.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

16. Teacher prevents situations that cause uncertainty, doubt, or perplexity in child's mind.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

17. Teacher teaches language and concepts through use of materials, games, or activities specially designed to teach language.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

18. Teacher uses as rewards very selective praise, attention, recognition, privileges, grades, prizes, candies, or other rewards.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

19. Teacher provides opportunities for cooperation and group work throughout the day.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

20. Teacher permits use of any sources of information or experience a child may want to have.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

21. Child initiates a task or activity.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

22. Teacher permits the child to leave an activity or task before finishing it.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

23. Teacher stresses using materials in prescribed ways.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

24. Teacher uses adult-level language with child, or requests child to use the teacher's words.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

25. Teacher is interested in the quality of final products, and in the child's ability to meet adult standards.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

26. Child is encouraged to follow teacher's set plan of activities.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

27. Teacher provides child with situations that make her or him experiment, explore, and solve problems on her or his own.

Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE

28. Teacher initiates and/or directs activity appropriate to the child's level.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

29. Teacher changes child's behavior by using special activities, games, or equipment (such as earphone and tape recorder, magnetic tape readers) that allow for immediate correction of child's error.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

30. Teacher allows child to follow his or her own interests, but ensures that materials used are appropriate for child's developmental level.

:	:	:	:	:	:	:
Strongly AGREE	Moderately AGREE	Slightly AGREE	Slightly DISAGREE	Moderately DISAGREE	Strongly DISAGREE	

---

1. Assign points as follows to your answers for each item.

Alternative	*Points*
Strongly Agree	6
Moderately Agree	5
Slightly Agree	4
Slightly Disagree	3
Moderately Disagree	2
Strongly Disagree	1

2. Sum your point scores for items 1, 3, 5, 7, 9, 13, 14, 20, 22, and 27. This sum represents your cognitive-developmental scale score.
3. Sum your point scores for items 4, 10, 11, 16, 17, 18, 23, 24, 25, and 29. This sum represents your cultural-training or behaviorist scale score.
4. Sum your scores for items 2, 6, 8, 12, 15, 19, 21, 26, 28, and 30. This sum represents your maturationist-socialization scale score.
5. Compare your three scores (subtract the lower from the higher in each case). If your scale score for one of the scales is 10 points higher than for the other, it may be taken to reflect your bias toward the theory represented by that scale. If the three scores do not differ by at least 10 points, you are not a strong adherent of any position. If none of the three scores differ, you have not yet firmed up your beliefs.

APPENDIX C

April 11, 1988

Dear Kindergarten Teacher,

The computer age is here! Or is it? I need your help to find out what really is happening with computers in kindergarten classrooms.

My name is Linda Stewart and I teach Prefirst at Indian Hill Elementary school. I want the information to complete a masters thesis on how kindergarten teachers use computers.

Please take a few minutes to complete the enclosed questionnaire and inventory. I want your most honest response so don't write your name anywhere. I will read any comments with great interest.

You can return the forms in the enclosed envelope through the school mail. Enjoy the stickers as part of my thanks for your help.

Sincerely,

Linda Stewart

APPENDIX D

April 25, 1988

Dear Kindergarten Teacher:

Thank you for your help in completing my computer activities questionnaire. I am getting lots of good information.

I do appreciate your time during these busy weeks.

Sincerely,
Linda Stewart

P.S.
If you haven't returned your questionnaire yet, please send it in.