

Kuwaiti Kindergarten Teachers' Attitudes toward Teaching Math and Using Children's Literature for Math Instruction*

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Abstract

The present study, incorporating quantitative and qualitative methodologies, examined Kuwaiti kindergarten teachers' attitudes toward teaching math and using children's literature for math instruction. Two hundred and seventeen kindergarten teachers responded to the researcher-developed questionnaire entitled "Teaching Math and Using Children's Literature for Math Instruction". Additionally, twenty four in-service teachers responded to in-depth interview to understand how teachers' personal and contextual experiences were related to their attitudes toward teaching math and using children's literature to teach math content.

The quantitative data were analyzed through appropriate descriptive statistics including Pearson Product Moment Correlations, ANOVA, Tukey Post tests, Eta, and Eta squared. The data analysis revealed that the variable attitude regarding the subject of math was shown to be positively correlated with teachers' attitudes toward teaching math using children's literature. Large percentage of teachers reported perceiving teaching math using children's literature as positive, enjoyable, and useful tool for math instruction. More than 52% claimed that they had difficulty finding math children's books to use for teaching math content.

The qualitative data was systematically analyzed through a process of content analysis. It revealed very different attitudes

* The study is financed by PAAET.

toward math. Teachers with negative attitudes recalled that they had disliked math from very young age, which due to their low interest and confidence in math resulted from weak educational background and lack of positive math learning experience. Moreover, they believed that children's literature should only be used to teach religious and moral issues. Teachers' with positive attitudes toward teaching math attributed their self-assurance and high level of math understanding. As the quantitative analysis, the interview data revealed that teachers with both positive and negative attitudes toward teaching math believed they don't have enough background to teach using children's literature effectively.

The interviews suggest a pattern of relationships between background and classroom success and the suggestions and complaints made by the teachers regarding their ongoing training and support. Recommendations and suggestions to enhance teachers' attitudes toward teaching math and making use of children's literature in math instruction in Kuwaiti kindergarten classroom are offered in the conclusion of the study.

Introduction

What will the world be like for tomorrow's children? When looking into the face of a child, one can often see a sharp-witted, wide-eyed curiosity and a triumphant expectation of life, not to mention great possibilities. However, these possibilities will not be realized unless "today's and tomorrow's children learn to live in a more environmentally conscious, equitable and peaceful way"; (Eisler, 2000, p. 3). Freidrich Froebel (1887) was the first to create a place where children could learn through joyful experiences. This place was kindergarten. In these "gardens" the teachers played a relatively passive role, while the young children were given seedlings of knowledge and allowed to bloom. At that time, this early stage of formal education was intended to serve several purposes. In *The Education of Man* (1887), Froebel described how the child gained knowledge mainly through observation and experiment. He said, "Therefore the child would know why he loves a thing; he would know all its properties, its innermost nature that he may learn to understand himself in his attachment" (p. 73).

The concept of kindergarten has evolved radically since that time, and the tasks of its teachers have correspondingly multiplied. contemporary researchers tend to view kindergarten as the place where

children, ages five to six years old, continue to develop a formal sense of language and expand their curiosity toward learning while exploring their environment. No one waits for children to spontaneously grow in today's full-day kindergarten programs. Instead, these classrooms have clearly defined academic goals. Kindergartners are encouraged to think and predict, solve problems, share ideas, ask questions, and make connections. They learn methods for exploring their surroundings, make and test predictions, and reach their own conclusions. According to Marzollo (1997), the major purposes today for a kindergarten program "is to teach children a rich, meaningful, and balanced curriculum of skills and information through age-appropriate activities [and themes] that encourage the children to want to learn more" (p. 8).

Presently, few existing studies focus on mathematics teaching and learning in kindergarten classrooms. According to Simpson and Oliver (1990), "Research results are replete with evidence that early childhood experiences serve as major influences of academic interest and achievement" (p. 4). However, according to Saracho (1993), research related to early childhood education has not grown compared with other fields. This is particularly important as Lansdell (1999) suggested that developing an appropriate math education approach could create positive attitudes and mathematics knowledge in early childhood years.

Mathematics is everywhere in our world and because literature portrays life, it is encouraging to use literature as a tool to explore and communicate mathematics content in simple language that author use to stimulate kindergartners' interests to learn and understand math. Through the use of quality children's literature, math is constructed with children as naturally presented in the text.

The use of children's literature integrated with mathematics can also help develop children's linguistic and cognitive abilities by creating problem-solving experiences in the classroom. This is done by using Literature and math toward making authentic connections with other curricular areas such as social studies where children acquire some understanding of human relationships, historical events, and cultural heritage. The book, *Jumping the Broom* (Wright, 1994) is an effective example for integrating a mathematics problem-solving experience into the classroom. Wright uses a problem-solving situation to enhance children's appreciation for the narrative. The story follows the Black

America theme that gives the children an insight into the lives of plantation slaves. Special attention is paid to the quilt which is given to the bride. The story revolves around the design of one quilt pattern made during the pre-Civil War era and allows opportunity for elementary students' awareness of angles in a geometric design, communication of mathematical thinking, development of spatial reasoning, applying skill with number, and developing an appreciation of the ways in which mathematics affected the lives of Black American slaves. Although the purpose of *Jumping the Broom* is not primarily mathematical, the use of such literature can be a viable method for integrating mathematics into the elementary curriculum.

Integrating Children's Literature and Mathematics in the Classroom (Schiro, 1997) is another example of how teachers can use children's literature as a vehicle for teaching mathematics. Schiro describes a model in which children's mathematical and literary development occur simultaneously. The model helps children respond to, reflect, and analyse the meaning of mathematics as well as the adequacy of its presentation. The children identify inadequacies or even incorrect presentations by editing the literature or altering the text, graphics, illustrations and so on, resulting in a new version of the book of which they are the editors. The book can be used by pre-service and in-service teachers to increase their mathematical and literary power, supplying them with the tools they need to increase the mathematical and literary power of their students.

Making a connection between mathematics and children's literature enables students to see mathematics in everyday society and gives mathematics meaning in their everyday lives. Because problem-solving is an important goal in the math curriculum, the math-literature link allows children a way to think and see mathematics involved in daily life. "Children tend to see mathematics as computation" (NCTM 1989, 33). But mathematics is a way of thinking about problem solutions, that may or may not involve numbers. According to the NCTM, in order to dispel the notion that mathematics is merely computation, more experiences must be offered to children whereby children gain other kinds of experience. This is done by incorporating problem-solving into

the curriculum and making connections to other school subjects through the use of children's literature. This will, in turn, will help to develop the cognitive and linguistic abilities of the child.

As for teachers' attitudes toward teaching math and using children's literature for math instruction, there is little research. In fact, there is no study that evaluates mathematics literature in the Arabic genre or the English one. In addition to making the connection between mathematics and children's literature, this paper will explore Kuwaiti kindergarten teachers' attitudes toward teaching math and using children's literature for math instruction. It will also examine factors that may have contributed to these attitudes, and examine how teachers' attitudes affect their teaching.

Research Questions:

- 1 - What attitudes do in-service kindergarten teachers in Kuwait have regarding teaching math to kindergarteners?
- 2 - What attitudes do in-service kindergarten teachers in Kuwait have regarding the use of children's literature for math instruction?
- 3 - Do teachers' attitudes toward math and their attitudes toward teaching math using children's literature significantly correlate?
- 4 - Do in-service kindergarten teachers' attitudes towards teaching math and using children's literature for teaching math differ in any of the following variables: *teaching experience, alma mater, approaches to teaching math*?
- 5 - What personal and contextual experiences with and perceptions of teaching math and using children's literature are related to kindergarten teachers' attitudes?

Definition of Terms

Attitude: For the definition of "attitude", I have adopted Fishbein and Ajzen (1975) description of it as: "a learned predisposition to respond in a consistently favorable or unfavorable manner toward a subject" (p. 6). Predisposition is inside and unobservable, giving us a hidden readiness to respond to various situations and issues.

Kuwaiti Kindergarten: An educational institution that is separate

from the elementary school; it offers two years of education, the first for 4-year-olds and the second for 5-year-olds. Children are taught through instruction, games, projects, play, etc. The curriculum deemed by the Kindergarten Department in Kuwait to be appropriate for kindergartners is based on the use of twelve themes for instructional purposes (Al-Balhan, 1998).

children's literature: Refers to high quality trade books that cover topics of interest to children. It includes fiction, nonfiction, prose, and poetry.

Research Methodology

Both quantitative and qualitative research methods have been used for this study, seeking the "binocular vision" described by Reichardt and Rallis (1994) that enabled both instrument defined and larger milieu data to be captured, with the intention of gaining the most distinctive and deepest understanding of the results. As they put it,

Qualitative researchers usually seek to explicate the meaning of social reality from the participants' perceptions, while quantitative researchers usually seek to understand relationships, often of a causal nature, without particular emphasis on the participants' perspectives. Nonetheless, at the most global level, the two traditions have a common goal to understand and improve the human condition (p. 11).

Several studies have applied both quantitative and qualitative methods, the so-called mixed-method approach, to explore teachers' attitudes toward science and teaching science. These studies suggest that the combination is more useful in helping researchers gain powerful information than using each method separately (Gogolin & Swartz, 1992; Ginns & Watters, 1995). Sampson (1992) further stressed the importance of this complementary relationship in the investigation of elementary teachers' attitudes toward science teaching. Qualitative interview data provides insights for constructing survey questionnaires as well as providing complete explanations of survey results.

Finally, Ball (1999) went so far as to define "good research" as a combination of both methods, for it provides the researcher with a better understanding of the phenomena that occur beyond any representation in numbers and words. In other words, the integration of

research methodologies may lead to a greater holistic interpretation of situations, including this study of teachers' attitudes and pedagogical content knowledge regarding of children's literature to teach kindergarten primary science concepts. The instruments used for this study are quantitative questionnaires designed to gather factual information about the participants, follow-up in-depth interviews, and evaluation of the Arabic and English math trade books for kindergarten level. The qualitative data provide detailed information through summarizing findings with the stance that qualitative and quantitative research together will provide the clearest picture of an existing state.

Participants

The study's target population is in-service kindergarten teachers in Kuwait. According to the latest figures from the Kuwait Ministry of Education, 3,073 in-service kindergarten teachers work in Kuwaiti public schools. A total of 500 questionnaires were distributed and 217 of them were collected from the six governorates and twenty four out of the 217 kindergarten teachers who completed the qualitative in-depth interviews, all of the participants were female.

Data Collection

Two different sources of evidence were used for data collection: 1) Data collected from the "*Teaching Math and Using Children's Literature for Math Instruction*" questionnaire developed and revised for in-service kindergarten teachers, and 2) An in-depth interview is used to obtain information to explain more completely the results of the questionnaire and to find out other contextual and personal variables that are associated with kindergarten teachers' attitudes toward the teaching of math and using children's literature for math instruction.

Questionnaire

In the process of developing the questionnaire for the study, findings and recommendations of researchers in the instrument construction field were used. The instrument was piloted with 23 Kuwaiti in-service teachers and information was gained from their additional feedback on its wording and organization. Responses from the pilot study were taken into account when revising the questionnaire items. Coefficient Alpha Cronbach, was calculated to obtain a measure of the

internal consistency and reliability of the instrument. This test of reliability was intended to provide a measure of the extent to which all items are positively intercorrelated in both scales as well as in the entire questionnaire. Internal consistency was used to test the reliability of the "Teaching Math and Using Children's Literature for Math Instruction" survey. The internal consistency was determined using Cronbach's Alpha, also referred to as Coefficient Alpha. Coefficient Alpha is designed to measure the internal consistency of all items within the instrument. The Coefficient Alpha was tested for each item within each scale and then ran the Alpha for two scales to help understand the consistency of the items in the survey, which ranged from .87 to .84 (see Table 1).

For research questions one and two, descriptive statistics were used. Research question three was designed to examine relationship between the variables of attitude toward teaching math and attitude toward teaching math using children's literature. Therefore, Pearson Product Moment correlations were utilized to measure linear associations between these pairs of variables. For research question four, an analysis of variance, ANOVA, Tukey Post Hoc test, Eta and Eta squared, Pearson Product Moment correlations were utilized to see whether kindergarten teachers' attitudes toward teaching math and attitudes toward teaching math through the use of children's literature differed by any of the following variables: *teaching experience*, *alma mater*, *approaches to teaching math*.

Table 1
Reliability Analysis of the Two Scales (n = 217)

Scales	Number of Items	\bar{X}	SD	Alpha
Scale 1	9	23.77	4.29	.87
Scale 2	11	22.58	4.41	.84

The result indicated a high degree of internal consistency among all the items in the survey. Thus, the attitude scales were internally consistent and a reliable measure of kindergarten teachers' attitude toward teaching math and teaching math using children's literature for this particular sample of 217 in-service kindergarten teachers.

Review of the Literature

Math education

Studies of teacher's concepts about learning and teaching have also been done in the area of math in early childhood classroom. Peterson, Fennema, Carpenter, and Loef (1989) explored the impact of curriculum, the teacher's instruction and the knowledge the students obtained. With a questionnaire and a clinical interview, it was assessed that for twenty-nine first grade teachers pedagogical content consisted of several constructs: A child can arrive at their own mathematical concepts, and organized math instruction is necessary for the formation of a child's knowledge. Teachers should "create an environment that is mathematically empowering and mediating children's experiences in this environment, thus establishing the foundation for constructing kindergarten", (Kirova & Bhargava, 2002, p. 9).

In 1960 Kuwait did as most western countries, it reconstituted the kindergarten curriculum to be focused on the cognitive, social-emotional, and sensory motor development of young children. This new curriculum consisted of two levels, the first serving children ages 4-5, and the second serving children ages 5-6. Today, the kindergarten curriculum is comprised of instruction and play. Children are taught about and through language, literature, arithmetic, natural science, music, art, motor skills, role-play, and creativity. Recently, since the Gulf War, theme teaching has been used in Kuwaiti kindergarten education. This is "designed to help children acquire organized, free, direct, and indirect learning, [and] to fulfill students' needs while developing their cognitive, social-emotional, communication, and sensory motor skills", (Al-Balhan, 1998, p. 56).

If the curriculum has changed, so too has the role of the teacher. Today kindergarten teachers are not only guides for children's emerging and developing selves, they are charged with delivering a broad range subject content, requiring an equally broad mastery of pedagogical knowledge. Importantly, one of the subjects kindergarten includes is math.

The National Council of Teachers of Math (NCTM) issued new visions for math education for tomorrow's citizens. In particular five general standards for all students are emphasized. These are:

- 1 - Learn to value math;
- 2 - Become confident in the ability to do math;
- 3 - Become math problem solvers;
- 4 - Learn to communicate mathematically; and
- 5 - Learn to reason mathematically.

Math Education is seen as providing a wonderful venue for the crucial life skills of searching for and discussing differing methods to answer puzzling questions. Therefore, "children need to master an ever-increasing knowledge base in science and math. Not everyone is going to be a scientist or mathematician, but everyone is affected by science and math on a daily basis (Rakon, 1999, p. 2).

Math was often considered as isolated from other area of study, irrelevant to everyday life, and lacking of creativity and aesthetics (Nolen, 1997). However, researches are replete with evidence that early childhood math instruction should be developmentally appropriate. Young children have the right to be involved in physical and mental activities in their environment at home and school. They should be educated through methods of learning that are meaningful to them, and more importantly math instruction should be based and centered on child, so children can become aware of and solve their own problems while, learning math (NCTM, 2000; Hong, 1996; Greenberg, 1993; Dutton & Dutton, 1991).

The in-service program "Summer Math for Teachers" is based on a configuration of math learning and instruction. In the logic and explanation of the program, Schifter and Fosnot (1993) noted that if change is to occur in math education, educators must be willing participants in that change. They added: "teachers are being asked to perform differently and at a higher degree of difficulty". According to Schifter and Fosnot, this is because an educator must have a deeper comprehension of the math they are to teach and to the concepts between math and the physical world. Teachers must also be aware of how children build mathematical concepts in order to follow student's progress and knowledge. This can be achieved through skilled questioning and appropriate classroom tasks.

The Curriculum Standards in United States, an influential docu-

ment published by NCTM (1989 - 1991), emphatically implied that the nurturing of math coherence comes from communication between the student and their common, intuitive concepts and the theoretical language and symbols of math. The same in the previous document, the NCTM announced that student should "understand and appreciate the role of math in human affairs" (p. 5). However, in math classroom young students feel frustrated and incompetent, and may begin to show a dislike for the study of math simply because it is considered as an abstract subject with a complex symbolic language for the presentation of its concepts and operations. This leads these students to have difficulty in teaching and learning in the classroom (Willoughby, 1990; Hughes, 1986).

Driscoll and Lord in the 1990 Yearbook of the National Council of Teachers of Math stated that math educators in the 1990's have the opportunity to take on the roles of responsibility and diversity that will challenge and potentially be more gratifying than those that shape the profession to date. However, math educators will have to revamp the way they perceive the learning process. Reviewing the professional literature on education change can be helpful in comprehending how this change comes about within the math teachers' conceptual process (Giroux, 1992).

Math and Children's literature

The last few years have witnessed an enormous increase of interest in children's literature and the use of it as an integration vehicle starts from kindergarten and goes through to elementary. It is seen as having the power to present math content in contexts that are familiar and meaningful to children and support their understanding of science content and materials. From the eyes of children's literature experts Hickman and Cullinan (1989), children's literature naturally enlivens information because it "is the one area that deals not just with facts but with feelings.. Literary works of all genres encourage the imagination and nourish the thinking process" (p. 4). There are some encouraging changes that have been made in the relationship between children's literature and math (Harris, 1998; Smith, 1995; Giroux, 1992). Children's literature helps children to view math as an "everyday human

activity" used for different purposes by all people. Literature presents a natural flow from which students will be encouraged to use the language of math in various life settings (Krogd, 1990).

Gailey (1993) stated that language and math skills develop simultaneously as students listen, read, write, and talk about mathematical concepts within the context of any given selection of children's trade books. Therefore, Math educators emphasized the use of children's literature as a catalyst for math experiences allowing language and math learning to occur naturally and creatively.

Children's literature has also been lauded by the language arts field for encouraging children's appreciation, understanding, and practice of their language. Montebello (1972) believes such use will lead to "an appetite and a zest for language and language learning" (p. 5). The role of reading across the curriculum has been examined and researchers have discovered both reading and writing to be an effective ways to introduce, teach, and reinforce the learning of math (Harris, 1998; Drake & Amspaugh, 1994; Siegel & Fonzi, 1995). One consideration in the link between children's literature and math is how fictional stories influence a child's thinking about concepts that are involved in mathematical exercises. Stories either that have been read to the student or that he or she has read for himself seem to bring great feelings of pride and accomplishment when the students (Harris, 1998; Lewis, Long, & Mackay, 1993) discover a mathematical concept within the story.

Nevertheless, the question is how teachers will appropriately approach math Instruction using children's literature educators confessed to varying degrees of knowledge regarding math and children's literature. Choosing appropriate literature and using it effectively hinges on knowledge in both areas. Brown, Cooney and Jones (1990) stated that lack of content knowledge is the problem facing elementary math teachers, because of this underlying problem the level of math extracted from the literature may be minimal. The main challenge discovered by Silva and Delgado - Larocco (1993) was in selecting and implementing literature that supports conceptual development, furthermore they stressed that comprehension of the literature selection and the content that will be used is a must.

Smith (1995) presented a different angle for sparking interest in

math. He states that children's literature is a bountiful resource of combining math problem solving experiences into the classroom, using the book titled *Jumping the Broom* by Courtin Wright was especially helpful. In the book chronicling the wedding celebrations of plantation slaves, spirited discussions began among third graders who wanted to recreate the quilt described in the book. The class discussion ranged from diamond shapes, angles and other quilt designs.

In Kuwait, children's literature has come to be an accepted component of kindergarten math instruction. Kindergarten teachers are encouraged to teach math as a process of making sense of the world, showing children how math connects with technology and many other disciplines. According to the Education Ministry (1999/2000), primary math teaching is designed to help children develop the skills necessary to help them understand the ideas of living and connected things. Children need to be involved in using scientific processes, including observation, finding evidence, drawing conclusions, and asking questions.

Because the kindergarten curriculum themes are centered on teaching children's math or language art (each theme has its word and number), teachers are encouraged to involve children in developing the ability to investigate and interpret math information. The Education Ministry designs the Teacher's Theme Manual to actively engage teachers and children in the dynamics and possibilities of any subject area. The new Teacher's Theme Manual, issued earlier this year, emphasized the importance of using trade books and all kinds of children's literature in science, math, and language classrooms.

Children's literature versus Children textbook

Trade books help overcome the many complaints that teachers have about elementary school textbooks. Several researchers suggest that textbook-based science instruction is intimidating, difficult to understand, and difficult to read, especially for students who already experience reading or learning problems. Young children are now regularly exposed to television and video games, which may contribute to students' failure to engage with day textbooks. Trade books, on the other hand, with their visually rich text and photos, are touted as allowing students to dive into and explore the world of knowledge

(Cerullo, 1997). Further, textbooks often fail to fulfill young student's curiosity and enthusiasm for exploring their environment, whereas science trade books can encourage children's curiosity about their surroundings.

Empirical Studies

Despite the popularity of recommendations concerning the use of children's literature to teach math for young students, few empirical studies exist that examine the effectiveness for math instruction. In this section, the existing empirical studies will explore that address the following questions: 1) Are stories good or bad for teaching math? 2) Does children's literature actually improve students' math performance by itself or in combination with other methods? In addition, 3) Are there problems with the use of children's literature for math instruction?

Hong (2002) conducted a study with fifty-seven kindergarteners (N=57) randomly assigned to either a control group or an experimental group. The purpose of this study was to analyze the effectiveness of using children's literature to promote math learning in kindergarten classroom. The experimental group learned using storybook reading and discussion time and played with math materials that were part of the storybook content. The control group received an ordinary storybook reading time and played with math materials not related to the storybook content. The results revealed that more children in the experimental group enjoyed the math corner and spent more time in it and preferred math tasks. Additionally, the experimental group students did significantly better than the control group in the classification, number combination, and shape tasks. Finally, the researcher found qualitative differences in the content analysis was attributed to the experimental group.

In her study, titled "Teacher's perceptions of the use of children's literature to create context for math instruction", Nolen (1997) examined teacher's perceptions of curriculum integration. Implementation of math within the text of children's literature may aid in connecting real-life ideas. The participants in Nolen's study were three elementary teachers with experience from three to twenty-five years. Using first, second and fourth grade students, classes were observed for two full days within the first observation. The second observation consisted of

eight math lessons during a six-week period, unannounced and occurring at the scheduled time for math lesson. In addition, Nolen conducted face-to-face interviews. The finding showed several major themes common. The conclusion revealed several points. These were: first, teacher's ability to choose appropriate literature and mathematical content depended on her knowledge in literature and math; second, curricula choices specified the state objectives and content of math; third, mathematical connections relied on teachers' resource books and teachers' manuals; and finally, the reliability of the math content was protected by the state, country, and textbook objectives. Smith (1996) studied the impact of children's literature on students math attitudes using multiple data resources on fourth grade classroom (N=25). The result indicated that positive changes in student attitudes toward math appeared when using children's literature in a majority of the fourth grade math experience. Furthermore, storybooks were helpful to elementary school students in their efforts to problem solving, "mathematical problem solving required [children] to apply knowledge, skills, and strategies, within novel context" (Fuchs, Fuchs, Karns, Hamlett, & Katzaroff, 1999).

The Variable Attitudes and Math

Over the years, the attitudes of groups or individuals have been of interest in many empirical studies. Thomas and Znaniecki, as cited in Shrigley, Koballa, and Simpson (1988), used attitudes as a psychological concept in their work "The Polish Peasant in Europe and America", considered a landmark for first considering attitude as worth study.

Bem (1970) defined attitudes as what people like or do not like. Attitude is seen as our favorable or unfavorable feelings toward specific societies, persons, and/or objects (Koballa, 1988). Moreover, the general term "may be defined as positive or negative affect toward a particular group, institution, concept, or social object" (Ary, Jacobs, & Razavieh, 1996, p. 239). For example, according to Koballa (1988), "babies are not born with attitudes toward snakes. Attitudes are learned from

experience. They may be learned either actively or vicariously. Because attitudes are learned, they are susceptible to change, but they are not momentarily transient" (p. 116).

Shrigley (1983) also saw attitudes as learned and involving cognition. Explaining the key elements, he said, "attitudes predict behavior; the social influences of others affect attitudes; attitudes are a readiness to respond' attitudes are evaluative, therefore emotion is involved" (p. 439). Nevertheless, Cho (1997) observed attitudes in a broader way, saying that attitudes are driven from "beliefs and behaviors as involving a person's feelings" (p. 21). In the following section, I will explore the ways that attitudes, beliefs, and values may interact to predispose and influence teachers of math.

There is an existing consistency between an individual's attitude scores and his or her subsequent behavior (Koballa, 1988). The consistent relationship between attitude and behavior becomes obvious when researchers try to measure attitude as a means of predicting human behavior (Ateaq, 1995; Shrigley, Koballa, & Simpson, 1988). Because of this relationship, Wareing (1990) defined attitudes as learned predispositions to behave in a particular way and in particular situations. These predispositions are expected to occur between the stimulus and the response or behavior (Shrigley et al., 1988).

In her study, *The role of attitudes and beliefs in learning to teach*, Richardson (1996) investigated literacy-related beliefs and attitudes. She found that teachers' attitudes represent their feelings toward learning and teaching in the classroom. She also noted that their beliefs directly relate to their knowledge of subject matter and the methods of transferring this subject matter. She found teachers' attitudes to be dependent upon their beliefs because "attitudes and beliefs are a subset of a group of constructs that name, define, and describe the structure and content of mental states that are thought to drive [teacher's] actions" (p. 102).

There were several reviews of research on attitudes toward math have been investigated through the past 25 years (Smith, 1996; Hart, 1989; Reyes, 1984; Aiken, 1970). They found that "math attitude involves positive or negative feelings of reasonable stability and has three basic

components: emotional reaction, behavior, and beliefs. Attitudes toward math are multimentional, in that a variety of different feelings may exist about the different types of math (Smith, 1996, p. 25).

In sum, attitude is learned and not inherited. Attitudes can be evaluated as liking or disliking something. Measurement of attitudes places individuals' evaluations along a continuum of favorability, or the lack thereof, toward an object, group, concept, and/or social status. In this study, I employed both quantitative and qualitative research methods. Two sources of evidence were used for data collection: 1) data collected from surveying 217 in-service teachers using the instrument: "*Teaching Math and Using Children's Literature for Math Instruction*" questionnaire developed by the researcher; and 2) follow-up interviews with in-service kindergarten teachers.

The ultimate purpose of this study was to explore in-service Kuwaiti kindergarten teachers' attitudes toward teaching math and using children's literature for math instruction, examining the factors that may have contributed to their attitudes.

The questionnaire employed in this study included two scales: one that measured each teacher's attitude toward teaching math and one that measured each teacher's attitude toward teaching math using children's literature.

Quantitative findings

Demographic Characteristics

Table 2 below reports the demographic characteristics of the study participants. The teachers ranged in age from 22 to over 37 years old and coded into four categories, with a mean age of 2.31 (SD = 1.01). The sample kindergarten teachers' mean total years' experience was 2.10 (SD = 1.05), with a range of 1 to over 16 years of teaching experience. The vast majority of the total participants (n = 217) had bachelor's degrees in kindergarten (99.3%). Sixty-three percent graduated from the College of Basic Education, and 33.8% received their degree from Kuwait University. Nine teachers graduated from overseas universities, and two teachers graduated from American Schools: the

University of Utah and California State University. Six teachers had bachelor's degrees from Cairo University, and one teacher had her degree from the University of Beirut Al-Arabia, in Lebanon.

Table2
Demographic Characteristics of the sample (n = 217)

Characteristic	n	%
Years of Experience		
1-5 years	64	29.0
6-10 years	92	41.9
11-15 years	45	20.3
over 16	16	6.9
Participants' Alma mater		
College of Basic Education	151	69.6
Kuwait University	57	25.3
Others	9	4.1
Approaches to Teaching Math		
1 - Discuss math conten with students	122	56.2
2 - Using math trade books	126	58.1
3 - Sorting and counting objects & recognizing shpes	166	76.5
4 - Perform math games & activities	117	53.9

In order to explore kindergarten teachers' attitudes toward teaching math when using children's literature, the following aspects of their teaching were examined: 1) the approaches that participants used to teach kindergarteners math; 2) the amount of time they spent using math books with their students; and 3) the number of children's math books they owned, or were in their classroom.

Regarding the approaches used, the survey showed that of the large number of kindergarten teachers in this study, 76.5% reported that they rather sort and count objects and shapes. One hundred and twenty six kindergarten teachers in this sample reported that they use math books to teach math content. About half of the participants discussed math

content with their students and perform math games and activities (56.2% and 53.9% respectively). Almost three-fourths of the participants performed math activities to teach math.

one-half of the teachers reported that they read math books aloud to their students at least once a day. Fifty-two teachers use math books once a day. More than half of the participants use math books to teach math only occasionally. Ninth participants reported that they use math books with their students at least once a week. About 5% hardly ever use any math books to with their students.

Tables 3 and 4 below report on the first and second questions of the study which examined in-service Kuwaiti kindergarten teachers' attitudes toward teaching math and teaching math using children's literature. For these analyses, the frequencies and percentages of kindergarten teachers' responses to each questionnaire item are also shown in Tables 3 and 4.

The average subject score on the nineteen item attitudes scales were judged to be positive, which indicated that, in general, kindergarten teachers' attitudes toward teaching math to kindergarten and using math trade books for math instruction are positive.

Table 3 responds to the first research question, designed to determine what attitudes in-service Kuwaiti kindergarten teachers have regarding teaching math. Participants were required to indicate their attitudes by checking one of the five descriptors, which ranged from "strongly agree = 5 points" to "strongly disagree = 0 point". This section, examining attitude, consisted of nine items. Those items measured teachers' comfort, enjoyment, and anxiety in teaching math to kindergarteners. Table 4 includes ten items designed to find out in-service teachers' attitudes toward teaching math in kindergarten classroom.

Table 3
Frequency and percentages of kindergarten teachers' attitude
toward teaching math to kindergarteners

Items	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly disagree %
Anxiety level	25	54	16	8	1.8
Comfort	28	59	9	2	1.8

Table 3
Frequency and percentages of kindergarten teachers' attitude
toward teaching math to kindergarteners (cont')

Items	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly disagree %
Answering questions	6	9	4	55	25
enough background	7	4	6	60	24
Favorite topic	14	23	5	50	9
Enjoyment	12	72	8	5	3
At ease w/math	23	45	19	10	2
Difficulty	10	23	16	26	2
fun	20	61	8	5	5

The first scale, *Teachers' attitude toward teaching math* is represented in Table 4. First, kindergarten teachers were asked about their comfort, enjoyment, and level of anxiety when teaching math to kindergartners. The majority of the participants strongly agreed (25%) or agreed (54%) with the item, "I feel comfortable teaching math". Only 4% disagreed with it. More than 90% of the kindergarten teachers in this study reported that they enjoyed answering students' mathematics questions, 28% strongly agreed and 55% agreed; whereas only four teachers strongly disagreed, and 2% agreed. About 40% of the participants agreed strongly or agreed that they did not have enough background to teach math to kindergarteners, and more than half of them disagreed (50%) or strongly disagreed (9%). Only 7% strongly disagreed or or disagreed (5%) with the item "Math is my favorite topic", and 23% of the teachers in this sample strongly agreed (45%) with this item. Eighty two percent of the participants felt at ease teaching math to young students, with 12% strongly agreeing, and 72% agreeing. Only 8% of the participants strongly disagreed. Teachers disagreed (26%) with the item, "I believe math is difficult for me to teach". Some kindergarten teachers agreed (23%) with it. When asked if "Teaching math is fun", 23% strongly agreed, 45% agreed, and only 10% disagreed or (2%) strongly disagreed.

Therefore, these results reveal that kindergarten teachers' comfort and enjoyment level was positive, and they were low in anxiety when responding to discomfort items.

Table 4
Frequency and percentages of kindergarten teachers' attitude toward teaching math using children's literature

Items	Strongly Agree %	Agree %	Neutral %	Disagree %	Strongly disagree %
Enjoy math books	45	47	5	2	1.3
Assist in choosing	22	55	18	5	0
Creating activities	28	50	13	8	.9
Finding books	37	51	9	2	1.3
Use of literature	34	49	14	4	1.3
Worth time/effort	23	56	9	7	5
Uncomfortable	9	12	3	45	31
Improved quality	25	72	.5	1.3	.4
Useful for introduction	25	73	.9	.4	1.3
Not appropriate	6	14	16	52	12
Background	7	21	18	45	9

Ten items were designed, in the second scale, to examine *Kindergarten teachers' attitudes toward teaching math using children's literature*. This scale measured in-service teachers' level of interest/enjoyment, and the teachers' like or dislike for using children's literature for math instruction. Almost the majority of kindergarten teachers in this sample (92%) [strongly agreed (45%) and agreed (47%)] are with the item, "I enjoy using math children's books with my students". Only 2% disagreed with it. Approximately 77% of participants [strongly agreed (22%) and agreed (55%)] enjoyed assisting students in choosing good math books; about 5% disagreed with them. More than 78% of teachers enjoyed creating math activities based on children's literature, with 28% strongly agreeing and 50% agreeing, whereas 8% disagreed with them.

About 88% of participants [strongly agreed (37%) and agreed (51%)] are with the item, "I have difficulty finding math books to use for teaching"; only 3.3% strongly disagreed (2%) or disagreed (1.3%).

One hundred and nine kindergarten teachers in this sample thought that teaching kindergarten math using children's literature made math an easy subject to teach; 34% strongly agreed and 49% agreed. Only 4% disagreed with them. More than 79% of the participants say [strongly agreed (23%) and agreed (56%)] that "teaching children math through children's literature is worth the time and effort". Many kindergarten teachers strongly disagreed (31%) or disagreed (45%) that they feel uncomfortable teaching math using children's literature; only 21% of teachers answered positively to this item (strongly agreed, 9%; agreed, 12%). The majority of teachers in this study agreed (71%) and strongly agreed (24%) that children's literature can improve the quality of teaching math to kindergartners. Almost all of the kindergarten teachers in this study answered positively (strongly agreed, 25%; agreed, 73%) to the item, "children's math books are useful for introducing math". Only (2.7%) disagreed or strongly disagreed with it. Most teachers in this study strongly disagreed (52%) or disagreed (12%) with the item, "Using children's literature is not an appropriate tool for teaching math to kindergarten students", some kindergarten teachers agreed (14%) and some strongly agreed (6%). When teachers asked about their background to teach math using children's literature, more than half of the participants replied negatively on this item.

The results illustrate that the perceptions and attitudes of kindergarten teachers toward the use of children's literature for math instruction were positive. Children's literature was found to be useful in introducing math, and making math an easy subject to teach. However, there were many teachers who reported that they had difficulty finding math children's books to use for teaching.

To answer question #3, Pearson Product Moment Correlation Coefficients were obtained to describe the relationship between the two variables, attitudes toward teaching math and attitudes toward teaching math using children's literature. The Kindergarten teachers' attitude toward teaching math was significantly correlated ($r = .780$), with the

Attitude toward teaching math using children's literature scale. Teachers with positive attitudes toward teaching math tend to have positive attitudes toward teaching math using children's literature.

for Research Question #4, a One-way Analysis of Variance procedure (ANOVA) was used. A tukey Post Hoc test determined the minimum differences between mean values to identify a significant different group, Eta was used to measure the correlation between variables, and finally Eta squared was used to find out the proportion of the variance in the dependent variables accounted for by the independent variables. All the above-mentioned procedures were carried out in answering Research Question #4.

The dependent variables are two scales: *attitude toward teaching math and teaching math using children's literature*. The independent variables are: *teaching experience, alma mater, approaches of teaching math..*

The variable of *teaching experience* was grouped into five consecutive ranges. The variable *approaches to teaching math* consisted of four methods and one open statement. These were: "Discuss math content with children", "Use math trade books", "Sorting, counting, and recognizing shapes", and "Perform math games and activities". The variable *alma mater* included two Kuwaiti institutes: College of Basic Education and University of Kuwait, and Others.

The group differences for *Attitude toward teaching math* scale, as well as the demographic variables. Two out of three variables exhibited significant differences. The one that did not exhibit any significant difference was the teacher's university. The details of the ANOVA, Tukey post hoc, Eta, and Eta squared analysis results for the significant variables are discussed below.

Teaching Experience

Significant differences were found in the responses of kindergarten teachers with varied teaching experiences. The tukey post hoc test revealed that teachers with 1-5 years of teaching experience differed significantly at the .001 level in their attitudes toward teaching math when compared to those with 6-10, 11-15, and over 16 years of teaching experience; similarly, teachers with over 16 years of experience reported to have the poorest attitudes toward teaching math using children's literature (see table 5).

Table 5

Variables	Mean	Group Differences	F	Eta	Eta-square
Teaching Experience & Scale 1					
1-5 years	(1) 19.01	1 < 2 > 3 > 4	7.20***	.3***	.09
6-10 years	(2) 24.53				
11-15 years	(3) 25.97				
Over 16	(4) 26.77				
Teaching Experience & Scale 2					
1-5 years	(1) 22.96	1 < 2 > 3 < 4	1.49***	.28	.08
6-10 years	(2) 23.02				
11-15 years	(3) 22.93				
Over 16	(4) 20.00				

In more detail, teachers with 1-5 years of teaching experience reported having less of a negative attitude toward teaching math. The other groups from 6-10 to over 16 years did not differ significantly from each other. Eta correlation was .3 at .001, and Eta squared showed that 9% of variance in the total scores of the *Attitude toward teaching math* scale is accounted for by one group of teachers' years of experience; whereas the second scale indicated that teachers with over 37 years of experience have negative attitudes toward the use of children's literature for math instruction. Eta showed a correlation of .28 ($p < .001$) levels, and Eta squared indicated that 8% of the variance is accounted for by one group.

Approaches to Teaching Math

Table 6 showed significant differences exhibited in the number of approaches participants used to teach math in their classrooms. Teachers who used fewer approaches have a less positive attitude toward teaching math than teachers who used more approaches. Eta results showed a small but significant relationship between the numbers of approaches used to teach math and attitude toward teaching math using children's literature scales at .001 levels. Eta squared indicated that 8% of the variance in the total score of attitude toward teaching math scale is accounted for by the number of approaches used and 9% justified by either discuss math content with children or use children's math books to teach math approaches variables.

The analysis of Questions One and Two indicated a positive response in two scales. The majority, 205 out of 217 of in-service kindergarten teachers reported that they use math trade books with their students. The results of the *Teachers' attitudes toward teaching math* scale showed that the majority of kindergarten teachers reported feeling comfortable teaching math, enjoying answering students' mathematics questions, believing that teaching math was fun, and reported feeling at ease when teaching. These teachers reported a high level of comfort and enjoyment, and reported little anxiety when responding to the negative items.

The *Teachers' attitudes toward teaching math using children's literature* scale indicated that almost the majority of teachers (92%) reported enjoying using math books with their students, enjoying

assisting students in choosing good math books, and enjoying creating math activities based on children's math books they presented in the classroom. More importantly, almost all of the teachers indicated that they agreed that children's math books are a useful means to introduce math to young students. The results showed that kindergarten teachers reported perceiving teaching math using children's literature as a positive, enjoyable, and useful tool for math instruction. However, in this scale there was also a large portion of teachers who reported having difficulty finding math books for teaching.

The Pearson Product Moment correlation coefficients showed a strong relationship between two tested scales. The results indicate that teachers who reported positive attitudes toward teaching math also tend to have the same attitudes toward teaching math through the use of children's literature.

Teachers with 1-5 years of experience reported having less enthusiasm toward teaching math and using children's literature for math instruction. In contrast, the teachers who were over 37 years old and had over 16 years of experience tended to have the highest positive attitudes toward teaching math and lower attitudes toward teaching math using children's literature, which means that those teachers like to teach math to their kindergarteners but they lack information with regard to the use of children's literature.

Qualitative findings

The purpose of the qualitative part of this study is twofold. Firstly, it identified the teaching experiences of kindergarten teachers with regard to teaching mathematical concepts to young students. Secondly, it obtained teachers' views and opinions about the use of children's literature, or more specifically, using math-related literature to teach kindergarten students. The use of qualitative research is significant because it brings meaningful insights to the quantitative results, the teachers' perspectives, adding to the overall richness of this study. A total of 500 questionnaires were distributed and 217 questionnaires were collected from six governorates and twenty four out of the 217 kindergarten teachers who completed the qualitative in-depth interviews.

Table 6

Variables	Mean	Group Differences	F	Eta	Eta-square
Approaches used & Scale 1					
Approach One	(1) 22.46	1 < 2 < 3 < 4	11.02***	.28***	.08
Approach Two	(2) 25.12				
Approach Three	(3) 28.55				
Approach Four	(4) 30.30				
Approaches used & Scale 2					
Approach One	(1) 21.46	1 < 2 < 3 < 4	10.25***	.30***	.09
Approach Two	(2) 26.98				
Approach Three	(3) 27.42				
Approach Four	(4) 29.88				

*** p < 001

The following interview information will assist the reader in gaining insight into the background and general attitudes of the participants in this study with regard to teaching math and using children's literature to do so.

The interviews revealed that fourteen teachers have negative attitudes toward teaching math to kindergarteners however, nine of them like the approach of teaching math using children's literature and the other five teachers don't know how to apply it into their teaching of math. Twenty teachers showed interest in teaching math to young students as well as using children's literature for this matter.

The findings contain descriptions of some variables which are associated with kindergarten teachers' negative attitudes toward teaching math and the use of children's literature for math instruction and contributors to kindergarten teachers' positive attitudes toward teaching math and the use of children's literature for math instruction.

● **Negative attitude toward math**

The first related to attitudes toward math teaching was that kindergarten teachers in the negative group all responded that they do not understand math. "I don't know if it's that I don't understand it, or I suppose I don't like math. I never like a subject that I'm not good at and math is something that I have not been good at from the time I was in elementary school. I never remember a time where I enjoy working on any math assignment". Norah's statement represents the teachers' negative attitudes toward math. Such attitudes toward math are expressed through teachers' low interest and confidence in math.

Lacking interest and assurance in math

Norah lacks interest in math due to her deficit of math understanding during her youth and subsequently believed that it is important to be exposed to a lot of math from an early age.

I do not teach math much, because I never liked math. Since my early years, I never understood math. I believe that young

children need to be exposed to math in a more friendly way like games and colorful books. If children learn to like math in the beginning, they will understand that math is everywhere.

Samar felt her low interest and confidence in teaching math to kindergarten was due to her lack of positive math experiences, which, she felt, had led to a weak understanding of math. She further stated that this lack of understanding of mathematics prevented her from teaching it effectively. She seemed to understand from her own experience that simply memorizing information (problem solving steps) had not meant she had "learned" it, because she could no longer recall what she had "learned" through memorizing.

Since I started school math was not my favorite subject. For me it was basically problems that I memorized how to solve, but I never use to understand the steps to solve a math problem for tests. Seriously, after the school year is over, I forget everything I memorized.

Some teachers related their negative attitude toward teaching math to kindergarteners to the fact that they believed that math was a very abstract subject and required "special thinking skills."

Math is not an appropriate subject for kindergarteners. It is very abstract and requires special thinking skills that I always avoid because I can not simplify it. (Ahlam)

I think math is difficult because I couldn't understand the benefits behind teaching math problems and the relationship among things like stuff related to classification and logical thinking. (Leila)

Because I'm not good at teaching math, you know, sometimes I do some comparisons and classifications, with children that's all. (Huda)

Sarah had a great lack of confidence in her knowledge of math. As a consequence, she developed low interest in math. She believes that math is an abstract subject; therefore it is not appropriate "for kindergarten students' level of understanding."

Math is difficult subject. I think most of what make me not interested in math is that I do not really understand it. I believe it is not appropriate subject for kindergarten. There is nothing in math that you can simplify and make appropriate for kindergarten students level of understanding. (Sarah)

Low Confidence in Pedagogical Content knowledge reflects on teacher's attitude:

"Pedagogical content knowledge" as considered by Shulman (1986) pedagogy and content are the sources that permit teachers to teach and communicate their knowledge in the classroom. He particularly emphasized that teacher productivity should be illustrated and evaluated through pedagogical content knowledge (Al-Hooli, 2001). The Kuwaiti kindergarten program is required a particular amount of math knowledge teachers should acquire to teach math for young children. However, they were convinced that they did not have enough background knowledge about math.

I never liked to teach math that much simply because I don't know how to teach it to children or even to the adults. Math is a subject for older students - not kindergarteners. I don't know, if what I do is right but I know that I don't know how to teach it because I don't know it. (Fatema)

I don't feel comfortable teaching math to kindergarteners because I am not strong at math. Anyway, I feel comfortable teaching subject that I know. (Salwa)

I took few math courses in my college, but I never been taught how to teach it to youngsters. I don't feel that I am qualified to teach math in the classroom. (Alham)

I don't know how to start with math. I mean start teaching math to kindergarten children I believe that math has to have drilling and working, with kindergarten at their age I don't know how to do it. (Nadia)

School administration:

In the Kuwaiti education system, teachers' eligibility for promotion

is tied to a grade they receive from the school supervisor and principal at the end of each year. This grade, which ranges from A to C, is based on weekly, unexpected visits that the principal and the school supervisor must pay to each teacher's classroom. They check on teacher's performance in general and the educational materials that she employs to teach her lessons.

The school administration always wants to see creative ways to teach children, but never thinks about supplying those teachers with the necessary resources to be creative and teach more effectively. Honestly, I am not willing to buy materials from my own salary. The Ministry of Education gives a certain budget to our school to make life easier for teachers in classroom. (Leila)

I want the school principal to be more aware of learning and teaching issues instead of other things that have nothing to do with education. I need the necessary resources to be creative and teach more effectively. We need resources, materials such as math games and objects or training programs to help me teach it right. (Nadia)

Our school administration and the Ministry should provide teachers with educational materials, equipment, and activities for each theme. (Zainab)

I believed that children learn best from well-executed, material-based activities available in the classroom; therefore, it is very crucial the Ministry of Education make them available, or the principal who has the kindergarten budget can put more money toward these kinds of things. (Mariam)

It is really hurt the teaching process when I lack the necessary materials and activities for my students to learn best. (Alham)

Educational experience relates to teachers' attitudes toward math

When teachers asked about their understanding of math and their experiences, they revealed that their complicated learning experiences in school and college are behind their negative attitude toward kindergarten math teaching.

Insufficient Math Learning in School:

Some teachers recall their unsatisfying school experiences. Two teachers' assertions show that deficient school experiences are related to their negative attitudes toward mathematical teaching to kindergarteners. Zainab explained that she felt herself unqualified to teach math was due to her lack of positive math experiences in early school years, which she felt, had led to a weak understanding of math. She further stated that this lack of understanding of math content prevented her from teaching it effectively.

I never have a single math teacher who simplified math subject for me. Almost all of our math teachers believed that math is for smart students, therefore, none of them bothered to help the "un-smart student" like me. (Zainab)

Our teachers at elementary school level taught us math using books to solve math problems but never hand-on activities as is required in kindergarten. I don't know how to simplify mathematical concepts to my students because I was never exposed to simple math. (Sawsan)

Lack of Math Pre-service Courses:

Many teachers attributed their negative attitudes toward math to their poor pre-service preparation for math teaching. They revealed that colleges did not provide them with enough math courses. In addition, all of them were convinced that they had two obligatory courses, math 1 and math 2, that have nothing to do with teaching kindergarteners math content.

Mona felt that her negative experience with math learning was compounded by her pre-service math teaching training. Since she already felt a lack of confidence, she only took the two required math courses.

I feel that my undergraduate years didn't provide me with enough training on how to teach young children math. Even the only two courses I had were very hard to understand. What I really wished I learned about how to teach math content in kindergarten classroom. (Mona)

The courses I had in college didn't teach me anything about teaching children math. (Hannan)

Samirah took math courses in her undergraduate level, but has some concerns on the quality of these courses. "They taught us the principles and theories." Her comments reflect her notion of the way to teach math to kindergarteners.

I had math courses as an undergraduate. It was a combination of math and math methodology courses. They didn't teach how to teach math to children but they taught us the principles and theories. I wish they taught us how to create games and exciting activities to help students understand math and to help us (teachers) simplify math to them. (Samirah)

Positive Attitude toward Math:

Twenty teachers were identified as having positive attitudes toward teaching math to kindergartners as a daily enjoyable lesson and/or activities. The major reason behind their positive attitudes comes from the fact that they liked to work with numbers and shapes. Some teachers explained the teaching of math as necessary as teaching them language skills.

High Interest in Math:

Farrah explained that her interest in math began in her early childhood, due in part to her family, they are scientific. Her parents and siblings spent hours of their time helping her with all subjects especially math and science subjects. They liked to explain math problems in many ways and get the same result every time.

I have always been interested in teaching subjects related to math and science from my early childhood years. All my family are scientists, and our daily conversations at home were always centered on new science discoveries. My parents helped me with my math and science homework and explained many things to me that I could not understand from my teachers. In the family if there is one person who has no interest in science studies, he/she considered the odd one. (Farrah)

Self-efficacy on Math Teaching:

Shahad pointed out that it helped her own enjoyment and confidence as a teacher to foster such independent thinking among her students.

My students know that in the classroom we all learn from each other. I taught them that their ideas are all useful and important for all of us and that we need to work together as a team to be able to learn from each other. (Shahad)

Teachers' positive attitudes toward the teaching of math came from their competence to teach math effectively. Their clear understanding and love for math reflected on their attitudes and teaching in the classroom.

Dallal admitted that she had had experiences in her own education that did not benefit her attitudes toward math. She liked playing with numbers and measuring things when she was a child. However, school was not helping her in loving math; she was more into understanding it.

Learning math in my school was almost an abstract subject. However, I liked math subject; I believe because I am more into understanding subject than memorizing it. (Dallal)

Hana also take pleasure in explaining her teaching methods. Math was everywhere for her. She possessed self-confidence due to her strength in her understanding and ability of communicating math knowledge with her students.

I feel that I am more than qualified to teach kindergarteners, simply because I learn from my children and their reaction toward the different teaching methods I am using. I look at their faces and reactions and see if they are communicating with me the math information. It is the knowledge that I am acquiring daily. (Hana)

Math is for Understanding:

Nora believed that it was very essential for teachers to learn how to communicate with their students mathematically. According to her, teachers should facilitate learning for understanding. She believed that teachers needed to understand their students' different learning styles to

create best learning lessons and activities for a successful learning setting. Nora is convinced that children's classroom environment should be filled with math materials to help students visualize math concepts.

I never believe in talking to and lecturing 4-6 years-old children. The best way to teach children is to communicate information with them. Therefore, teachers need to be aware of their children's ways of learning and the subjects they like best to be able to teach them. Teaching math is not easy, especially with younger students. They need to see math everywhere in the classroom, numbers and measurements to be hanged on the class walls to help children become more and more familiar with it. (Nora)

Role of Administration

Noor was, however, concerned about the amount of money she had to spend in order to teach every theme effectively. Like Sahar, she wanted the school to provide her (and other teachers in the school) with a kit that had different materials, activities, and books for each theme. They think that math will be much easier to comprehend if it were presented with a variety of teaching and learning materials.

We are looking for school cooperation in providing teachers with different materials, books, and activities for each theme and lend it to teachers for each theme. (Noor)

Different materials can make math an easy subject for kindergarten. Those materials will help the teachers teach be at ease and will help children to understand the concepts. (Sahar)

I think each theme in our kindergarten curriculum should come with a kit that consists of all the materials, games, and books needed to teach any subject including math. (Haddel)

In-service Programs and Workshop Trainings:

Teachers with positive attitudes are always in need for ways to help improve their performance in the classroom. Nofa felt that the Ministry of Education needed to augment the support and training that the teachers received. She explained about the practical knowledge she gained from observing other teachers contributed to "a lot of good

ideas for [her] classroom setting and different ways to make activities." Other teachers believed that although they liked math and they work on it everyday, they still needed to be involved in some training sessions to help them improve their teaching.

As a concern teacher I need the Ministry to structure an in-service program and workshops where we learn about different teaching styles and methods such as the use of children's literature and different ways to conduct experiment with children. (Tahani)

I like the idea of going to other schools to observe teachers teaching. We need to see how other teachers create lessons and activities for each theme. We need to learn from each other. Last year I observed one teacher and it was very useful. I am looking forward to going to another school to observe more teachers, especially math and science experiments. (Nofa)

Math is my favorite subject. I do a lot of math activities with my students because I believe everything around us can be presented as math symbols. However, I feel that the methods I am using to teach children are too old. I really need to go back to school and learn new things. (Rolla)

I graduated from college three years ago, however, I have never been in any in-service programs. I need to be enrolled in a program where they teach us different teaching techniques. I want to learn new different ways of presenting information to the students. Also, I am looking for classes [in which] teachers work together and learn from each other, like a workshop. (Rana)

To help improve myself in teaching, I need to visit other teachers in action, teaching children. In addition, I would love it if they would allow teachers to go back to school and learn as "professional development" for our career. (Merrriam)

Past Experience:

Ahlam may have had the most positive attitude of all of the teachers and it was no surprise to me that her background held all of

the influences that, in the other teachers, had correlated positively with a high interest in math and science and teaching. Her mother had been a teacher for twenty years, and had instilled in her willingness to explore and an appreciation for scientific wonder.

In another sitting Ahlam explained that being "Smart" means you know how to do math problems. At the beginning, she felt very frustrated with this notion, then she found her self loving math because "I understand it better than any other subject, I guess I am just like my mother."

My mother has been a teacher for more than twenty years. She teaches math and science. One day my mom brought home a caterpillar. I spent a whole hour counting the legs of this caterpillar. Then, my mother taught me to count by two. It was a huge experience at the time that I would never forget it! (Ahlam)

When I was young, people in my family thought that I am the smartest because I used to solve problems that my older sibling could not do. I felt very stressed, but eventually I grew to love math and understand it better than any other subject, I guess I am just like my mother. (Ahlam)

The Role of Children's Literature:

In response to a question about using children's literature tot each math, some teachers said that they did not have the knowledge of using math literature in their classroom. Norah and Huda also argued that they had only been taught to use it for teaching social subjects. Furthermore, it would negatively affect the budget.

I never knew literature could be used for teaching mathematic concepts. (Norah)

Using children's literature to teach math may be a very effective approach but I am having trouble getting my hands on good math books. (Huda)

Sammar learned from a "Children's Literature" course that children's books and stories are meant to be used in the classroom for teaching, such as historical and more ethical issues. In fact, she thought

that children's literature's use of narrative and stories could offer nothing to someone learning and teaching math. She explained her rejection as:

Mathematic books should be used with students who know how to read for themselves, so they will be able to understand. I do not think it would be a good idea to sit with children and read a book for the purpose of teaching math.

She then admitted that she did not even like to use children's books to teach moral lessons.

When I use children's literature to teach moral lessons, my students are required to pay attention to the moral concept being presented. it is boring.

Leila does not value, nor perhaps even understand, the role of children's books as a tool that might help her get some ideas about how to teach math. Lack of familiarity with different ways of teaching math left her feeling uncomfortable with the use of children's books for children.

We do not have what is necessary for a proper mathematic class to take place. It would be so exciting to have good math materials, games and equipment such as measurement tools to help us teach the themes, but children's book for math, I don't think so."

Hannan was interested in children's literature, but had not learned about its use for teaching math or any other subject. After observing many books, she felt that she should be encouraged to take advantage of this valuable instrument for teaching math:

Children's literature was not an issue in my teacher preparation program. However, after visiting many book stores in Kuwait and other countries, I observed many interesting books that I consider very useful for my students particularly Pop up books.

Farrah wrote the usefulness of math children's books for teaching all kind of subject. She explained how much children's books help her find successful lessons for everyday circle time. She found books to be very useful for constructing knowledge based on facts in more colorful and humor ways.

I am always fascinated by all kind of genres. I especially interested in reading and collecting information books based on facts that explain different scientific phenomena. I have wonderful books, about human organs and numbers "Count with Me".

Speaking about her college experience, Hanna mentioned that she had taken one children's literature course, where she learned about the various genres. Like Sammar, Hanna had a professor who encouraged the use of children's literature for history, ethics, religious, and all kind of social relation, and never mentioned the usefulness of these books for other learning or teaching processes. Hanna believed that children's literature in general "help [her] students understand the concepts and to visualize the words they hear repeatedly especially the story of M & M. It is an American book about the popular candy M&M.

I do agree with the idea of using children's literature to teach different kind of subjects such as history, ethic, language art, and even math. The use of children's books help my students understand the concepts and to visualize the words they hear repeatedly especially the story of M & M. It is an American book about the popular candy M&M, I translate it and I am using it with my children many times. In fact sometimes they asked me to use it for my circle time.

Sammar was also eager to point out that when the children are learning math they don't even mind enhancing their reading and writing skills.

It is a lot of fun to teach kindergartners, as I interact with children I have found that children are not very interested in learning how to read and write, but when it comes to topics related to math, such as counting, classification, we do use many things such as games, puzzles, and interesting books.

As she continued to write about her interest in children's math books, Rolla explained how she felt about the lack of children's books, mentioning that many teachers had complained that they could not find enough books to use in their teaching. She claimed that the English genres are more appealing than the Arabic ones.

I am always into reading children's books to my students. I

have many books in my class. My books teach many subjects, such as language arts social and scientific concepts including math. These days there are many math books presented in the Kuwaiti market; English and Arabic. However, the English books are more interesting and colorful for kindergartners.

Teachers believed that children's books provide their class with exploration and creative ideas to conduct with their students in the classroom. They think that children's literature very engaging to kindergartners because the context put together to communicate with children add to it the colorful pictures and drawings.

I feel very confident using children's literature to teach all subjects, especially math, science and language arts. I love my books and I am willing to spend my salary on buying them. There are books with many creative activities and games that I use in my teaching. (Dallal)

I feel confident teaching math using children books. (Nora)

Overall qualitative in-depth interview

The interview data show that Kuwaiti teachers have different attitudes related to their teaching math and using children's literature for math instruction. The findings from the in-depth interviews revealed existing patterns of kindergarten personal experiences related to their attitude toward teaching math and the use of children's literature for math instruction. There is also an emerging picture in the suggestions and complaints made by the teachers regarding their ongoing training, support, and school administration. Teachers with negative attitudes toward teaching math believed that their low interest and self-assurance in math resulted from weak educational backgrounds and a lack of positive math learning experiences. For most participants school math was often considered irrelevant to everyday life, and lacking of creativity and aesthetics (Nolen, 1997). Teachers explained that they received inadequate pre-service preparation, which had had a major impact on their negative attitudes and anxiety in the math classroom. Some teachers believed that math is an abstract subject, therefore, it shouldn't be taught to four-to-five year old students.

Norah and Sammar experienced lack of math knowledge and low self-assurance in their abilities to teach math to their students, which relate to their poor prior educational background and experiences. As consequences they developed fear of teaching math and labelled themselves as less successful teachers, neglect math as subject that should be taught to kindergarteners, and disregard any new method for teaching math such as the of Children's literature. Some teachers in the interview have had insufficient content knowledge of math and incapability to teach it to their students. These teachers were developing an intimidated feeling by teaching math.

Farrah and Ahlam expressed positive attitudes toward teaching math, which related to their successful academic experiences and the influences of people at home. Other teachers with same attitudes Dallal and Ahlam asserted that their strong educational background and the way their rewarding experience with math, in early years influenced their attitudes. As a result, they developed self-confidence and success to teach math to kindergarten.

There were logic interests among teachers regarding the use of children's literature for math instruction. Not surprisingly, teachers with negative attitudes who lack interest and assurance in math had learned that children's literature should be used solely for teaching religious and morals issues. Few of them thought that the use of such tool could help improve their teaching of math, to do so; they requested in-service training on different books for math teaching and learning. Teachers also had trouble finding good books. Some negative attitudes teachers related their lack of understanding of using children's literature to the lack of books in Kuwaiti markets. However, Teachers who possessed positive attitudes toward teaching math and regarded the use of children's literature for math instruction as very appealing and fascinating experience for kindergarteners appear to have had no problem finding the right books for their everyday teaching. In fact, some of them have had a shelf full of literature to teach scientific subjects. Nora and Huda have had learned that children's literature should be used only for teaching social, history, ethics and other related area only in their teaching preparation program.

Almost all interviewed teachers complained about the lack of resources and necessary classroom materials and equipments that the Ministry of Education should provide them with. Not surprisingly, some of them related their insufficient classroom teaching and learning to this deficit.

Cross-quantitative and qualitative findings

The qualitative findings, described above, supported the quantitative results of the study, providing further unique and specific details. As it were in science and the variable attitude (Al-Hooli, 2001), the most significant result of the survey that the variable of attitude regarding the subject of math were shown to be positive correlated with teachers' attitudes toward teaching math in the classroom.

The findings may indicate a predicted relationship between teachers who did not like math as students and teachers who have negative attitudes toward teaching math. The survey indicated more than half of the participants responded negatively to the following items "I have the background to teach math using children's literature, "this item revealed an interesting finding regarding the background and ability of Kuwaiti kindergarten teachers in teaching math as well as using children's literature into math. As Nolan concluded teachers' ability to select appropriate literature for mathematical content depend on their content knowledge in both literature and math. However, the participants' answer to the item "I feel uncomfortable teaching math using children's literature was negatively stated as 76% strongly disagree and disagree. This finding revealed that great numbers of Kuwaiti kindergarten teachers don't have the background to teach math using children's literature, but some of which they still feel comfortable using it, because they feel it would be a good way to present math to youngster, but many teachers revealed that they could not find math literature in the book market and that itself, according to teachers, is frustrating. Hickman (1997) argued that "many elementary school teachers have some concerns in the area of book selection because very few of them are experts in mathematics and science" (p. 2). This is true because the survey showed that 88% of the participants believed that children's

literature is useful tool for math instruction. Interview teachers with positive attitudes and were convinced that children's math books were an appropriate and effective tool to teach math.

The use of children's literature for math instruction is considered a tool for better teaching for understanding math, simply because literature has a story line children may find it easier to follow the ideas that are piece of a plot than to understand facts as presented in a textbook. However, according to the existing literature (e.g., Drake & Amspaugh, 1994; Hickman & Gullinan, 1989; Gailey, 1993), the use of children's books requires teachers to have math background, such that they will be able to choose a book with accurate math information. The survey data indicated that the teachers with least teaching experience had the poorest attitude toward teaching math and they reported positive attitudes toward the use of children's literature for math instruction. This might point out that those teachers not comfortable teaching math, but they believe that children's books might help them with teaching math to kindergarteners. Teachers who have had over 16 years of experience reported negative attitudes toward the use of children's literature for math instruction, this may have had something to do with the fact that the use of children's literature is in its infancy, so teachers may not have had enough exposure to this enhancement of math education. Survey results also indicated that the poorest attitudes toward teaching math were reported by teachers who taught math by discussing math content with their young students. Perhaps poor attitudes led to minimal preparations for math teaching. On the other hand, teachers with positive attitudes were very enthusiastic about using children's literature in math instruction.

The qualitative findings are supported by the survey results. There were positive correlations between teachers' attitudes toward teaching math and their attitudes toward teaching math with children's literature. The interviews revealed that teachers with positive attitude showed interest in teaching math using children's literature and willing to try any other good ways to teach children's math content.

Suggestions and recommendations

After examining teachers' comments regarding school administrators and Ministry assistance, it is my sincere hope that some of the emerging conclusions will be useful to teachers, educators, and the Ministry of Education in the State of Kuwait. All interviewed teachers commented on a lack of math materials and supplies in their school. They expressed the belief that neither the Kuwaiti Ministry of Education nor their school administrations provided adequate math materials necessary to create effective math or any other learning environments, which seemed as a barrier for them in teaching. Further, in-service professional programs and training workshops could be made available for all teachers to upgrade their teaching quality. More specifically, they wanted in-service hand-on courses to improve their ways of construct and create activities.

Of primary importance, given the discussion above, is a need for greater consideration regarding the design of math and children's literature courses in both Kuwait University and the College of Basic Education. Productive math courses at the level of pre-service education may encourage students to acquire positive attitudes toward math and math teaching. In addition. The survey findings suggest that the majority of kindergarten teachers in this study had positive attitudes and regarding teaching math with children's literature. It seems most reasonable that such perceptions be encouraged and endorsed through carefully designed of current children's literature courses at the college level.

اتجاهات معلمات رياض الأطفال الكويتيات نحو تدريس واستخدام أدب الأطفال في الحساب*

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الملخص

هدفت الدراسة إلى التعرف على اتجاهات معلمات رياض الأطفال بدولة الكويت نحو تعليم الحساب واستخدام قصص وكتب الأطفال لهذا الغرض، وكذلك أثر بعض العوامل على الاتجاهات وهي كالتالي: العمر، سنوات الخبرة، جامعة التخرج، الطرق المستخدمة في تعليم الحساب، عدد مرات استخدام قصص وكتب الأطفال، عدد قصص وكتب الأطفال الموجودة في الفصل.

لتحقيق أهداف الدراسة استجاب (٢١٧) معلمة في مناطق رياض الأطفال في ستة محافظات بالطريقة العشوائية. وتم استخدام إستبانة من إعداد الباحثة، بالإضافة إلى مقابلات مقننة مع المعلمات بلغ عددهن (٢٤) معلمة.

ويمكن تلخيص أهم نتائج الدراسة على النحو التالي:

- ١- اتجاهات المعلمات نحو تعليم الحساب لأطفال الرياض ارتبطت إيجابياً باتجاهات المعلمات نحو استخدام قصص وكتب الأطفال لتعليم الأطفال الحساب.
- ٢- نسبة مئوية كبيرة من معلمات رياض الأطفال أبدوا مستويات عالية من الارتياح والمتعة في استخدام قصص وكتب الأطفال لتعليم الحساب، ولكن في المقابل دلت النتائج على أن المعلمات بحاجة إلى المزيد من التدريب على استخدام تلك القصص والكتب.
- ٣- الاتجاهات السلبية لمعلمات الرياض نحو تعليم الحساب كانت بسبب قلة معرفتهم بالحساب نتيجة لخبراتهم السابقة في المدارس والجامعات.
- ٤- الاتجاهات الإيجابية لمعلمات الرياض نحو تعليم الحساب كانت ثمرة لتعليم وخبرات سابقة ناجحة في فهم الحساب واعتباره أسلوب تعلم حياة.
- ٥- أبدت معظم المعلمات حاجتهم إلى الدعم المالي والتدريب على طرق تعليم الطفل واستخدام أحدث الوسائل لهذا الغرض.

* البحث ممول من قبل الهيئة العامة للتعليم التطبيقي.

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